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THE MILITARY UAS REVOLUTION: BALANCING PUBLIC INTEREST AND PRIVATE RIGHTS

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Canada

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ABSTRACT

Human rights, civil liberties and private property rights are fundamental values in most modern democratic societies. These values are increasingly under attack through global asymmetrical threats from individuals and groups that are not identifiable state actors, that operate outside conventional geo-political and diplomatic protocols, and that do not adhere to the laws of war. The "enemy" is increasingly difficult to identify, and operates covertly both within and beyond our borders. Resort must increasingly be made to non-kinetic operations involving greater use of surveillance, intelligence, and covert security operations, both within Canada, and offshore.

Military "unmanned aircraft systems" (UAS) are playing an increasing role in such operations. UAS are also widely available to the private sector and general public, and are increasingly used by criminal and terrorist elements. There are many challenges to effective regulation of UAS including ensuring aviation safety in shared airspace, restricting access to UAS by criminals and terrorists, and protecting civil liberties and private rights while allowing increased surveillance to address security threats.

Effective regulation that balances the public interests of aviation safety and national security, without unduly compromising the very values, freedoms and liberties that we value, is required. This paper examines current regulation in Canada, and compares approaches in the US, the UK and New Zealand. It concludes that Canadian law is lagging behind the rapid pace of technological development and proliferation of UAS, and makes recommendations for reform to address issues of aviation safety, national security and protection of civil liberties and private rights to address these challenges.

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LIST OF ABBREVIATIONS

ADF	Australian Defence Force
AGL	Above ground level
ACSO	Air Combat Systems Operator
AVO	Air Vehicle Operator
CAA	Civil Aviation Authority (UK)
CAANZ	Civil Aviation Authority New Zealand
CANSOFCOM	Canadian Special Operations Forces Command
CARs	Civil Aviation Rules
CBRN	Chemical, Biological, Radiological and Nuclear
CF	Canadian Forces
CICA	Convention on International Civil Aviation 1947
CJOC	Canadian Joint Operations Command
COA	Certificates of Waiver or Authorisation (FAA)
CONOPS	Concept of Operations
CS	Continental Shelf
CZ	Contiguous Zone
DND	Department of National Defence
EEZ	Exclusive Economic Zone
ECHR	European Convention on Human Rights
FAA	Federal Aviation Authority
FERP	Federal Emergency Response Plan
FINAS WG	NATO UAV Flight in Non-Segregated Airspace Working Group
FLIR	Forward Looking Infrared
GPS	Global Positioning System
HALE	High-altitude/Long-endurance
IATA	International Air Transport Authority
ICAO	International Civil Aviation Organisation
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICCPR	International Covenant on Civil and Political Rights

ISP	Internet Service Provider
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
IT	Information Technology
MAA	Military Aviation Authority (UK)
MALE	Medium-altitude/Long-endurance
MERP	Maritime Emergency Response Protocol
MND	Minister of National Defence
MTOW	Maximum Take-off Weight
NAS	National Airspace System
NATO	North Atlantic Treaty Organisation
NORAD	North American Aerospace Defense Command
NZ	New Zealand
NZDF	New Zealand Defence Force
PAO	Public Aircraft Operations (US)
PfP SOFA	Partnership for Peace Status of Forces Agreement 1995
PIPEDA	Personal Information Protection Electronic Documents Act 2000
PKO	Peace-keeping Operation
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft System
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SFOC	Special Flight Operations Certificate
SOFA	Status of Forces Agreement
STANAGs	Standardization Agreements (UN)
TAA	Technical Airworthiness Authority
TAM	Technical Airworthiness Manual
TC	Transport Canada
TS	Territorial Sea
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System(s)
UAV	Unmanned Aerial Vehicle or Uninhabited Air Vehicle

UAVS	Uninhabited Air Vehicle System
UDHR	Universal Declaration of Human Rights 1948
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea 1982
UNSCR	United Nations Security Council Resolution
US	United States
USNORTHCOM	United States Northern Command

INTRODUCTION

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.

US Declaration of Independence, 1776

[S]ocial and economic life creates competing demands. The community wants privacy but it also insists on protection. Safety, security and the suppression of crime are legitimate countervailing concerns. Thus s. 8 of the Charter accepts the validity of reasonable searches and seizures. A balance must be struck…

Justice Binney in *R v Tessling* [2004] 3 SCR 432, at para [17]

Background

The use of Unmanned Aerial Vehicles (UAVs) for military purposes is not new, with examples of unpowered surveillance craft being developed in the 19th century, and powered craft since the early 20th century.[1] Early developments were driven by military needs and technological innovation, with individual UAVs operating primarily in the "sense" domain of reconnaissance and surveillance. More recently the use of UAVs has expanded into the "act" and "shield" domains with weaponised UAVs being used for

[1] Martin J. Dougherty, *Drones* (London: Amber Books, 2015), 10-15; Office of the Privacy Commissioner of Canada, *Surveillance Drones: Privacy Implications of the Spread of Unmanned Aerial Vehicles (UAVs) in Canada*, (Ottawa: Privacy Commissioner of Canada, 2014), ("Privacy Commissioner (2014)"), 8-9 (General History of UAV development), and 10-14 (A Canadian history of UAV development); and Andrew Carryer, *A History of Unmanned Aviation in Canada* (Richmond, Canada: Macdonald, Dettwiler & Assoc, 2008), http://www.uavs.ca/outreach/HistoryUAVs.pdf

direct combat and force protection effects, as well as targeted killings by some states in counterterrorism operations. Future developments include greater roles for UAVs in the "command" and "sustain" roles, including with the former, provision of enhanced communications and command networking, and with the latter, logistical support for operations, including provision of supplies and materiel, reconstitution, backhaul, retrograde and medevac operations.

The rapid growth of computer systems, miniaturisation, digital technology and mass production has enabled UAVs to become much more widely deployed, not just in military organisations, but also by other government and civilian agencies, the corporate sector and individuals. The term "Unmanned Aircraft Systems" (UAS) is now widely used to refer to the use of UAVs in an increasingly integrated manner, often incorporating sophisticated ground control systems and communications links, along with the logistics needed to deploy and support such use.

The proliferation of UAS has generally outpaced the development of the law and policy in most jurisdictions, and raises many challenging legal questions. At the domestic level concerns arise with aviation safety including near misses between UAVs and civil aircraft, interference with private property rights, invasion of privacy, breach of fundamental freedoms and liberties, and the commission of crimes. At the international level there are also concerns, not only over aviation safety and the use of UASs by terrorists and international criminals, but also in the use of UAVs by governments and military in a way that may result in breaches of the sovereignty of other countries, breaches of human rights and the laws of war, and commission of what may amount to

war crimes.

Task and thesis statement

This paper examines the appropriate balance to be struck in Canada between aviation safety, national security, human rights and private rights at a time of rapidly increasing use of UAS by the military, the private sector, criminals and terrorist elements. It is argued that there is a need in Canada for greater regulation and clearer government policy on the use of unarmed military UAS by the CF for surveillance and reconnaissance. It is also argued that there is a need for greater regulation and restrictions on the proliferation of UAS in the private sector, and by individuals, given the risks to civil aviation and the potential for their use in acts of terrorism and other criminal activity.

Outline of the thesis

This paper will be limited to the examination of constitutional, legal and policy issues that arise when unarmed military UAS are deployed in the *sense* domain of military operations for reconnaissance and surveillance. The paper will examine the issues that arise in three zones: 1) domestically within Canada's land territory, and the 12 nm territorial sea limit ("territorial sovereignty zone"); 2) beyond Canada's territory but not in the jurisdiction of other states; and 3) on expeditionary operations in the territory of other states, including NATO or UN mandated operations, and other coalition or independent operations. The use of weaponised UAVs and UAS to conduct pre-emptive

strikes and in combat missions is beyond the scope of this paper.[2]

Chapter 1 will examine the current state of UAV and UAS technology, and the various domestic and expeditionary uses of unarmed UAS in the military and security context. Chapter 2 will outline the fundamental human rights, freedoms and liberties, and personal rights under the law in Canada, and similar jurisdictions, directly applicable to UAS. Chapter 3 will discuss in depth the current legal controls on the use of UAS in Canada and extraterritorially by the CF, other civil agencies, and the private sector. Chapter Four will examine the legal controls and approaches in comparable allied jurisdictions such as the US, the UK and New Zealand. Chapter 5 will draw conclusions from the comparative analysis, and make suggestions for reform.

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[2] For recent commentary on these issues, see: UN Human Rights Council, Special Rapporteur on extrajudicial, summary or arbitrary executions, *Study on Targeted Killings*, Human Rights Council, UN Doc. A/HRC/14/24/Add.6 (May 28, 2010) (by Philip Alston), http://www2.ohchr.org/english/bodies/hrcouncil/docs/14session/A.HRC.14.24.Add6.pdf; James Cavallaro, Stephan Sonnenberg, and Sarah Knuckey, "Living Under Drones: Death, Injury and Trauma to Civilians from US Drone Practices in Pakistan", Stanford: International Human Rights and Conflict Resolution Clinic, Stanford Law School (New York: NYU School of Law, Global Justice Clinic, 2012), especially ch. 4 "Legal Analysis", https://law.stanford.edu/publications/living-under-drones-death-injury-and-trauma-to-civilians-from-us-drone-practices-in-pakistan/

CHAPTER 1:

THE CURRENT STATE OF UAS TECHNOLOGY AND ITS APPLICATIONS

The risk when attempting to describe the "current" status of any rapidly developing technology is that the words are already out of date when written. Nevertheless, this section will briefly describe the nature of UAVs, the history of UAV development, Canada's role in research and development in this area, the range of UAVs/UAS available, and the various currently known applications of UAS in the *sense* domain.

Definitional issues

Aircraft that are remotely piloted, and which may have some elements of autonomous capability, are referred to by a number of names including "drones", "unmanned aerial vehicles" (UAVs), "uninhabited air vehicles"[3] (also UAVs), "uninhabited air vehicle systems" (UAVS),[4] "remotely piloted aircraft" (RPA), "remotely piloted aircraft systems" (RPAS), "unmanned aircraft" (UA), and "unmanned aircraft systems" (UAS).[5] All of these descriptions have some limitations. For example, a "drone" can be defined as "a pilotless aircraft that can operate autonomously".[6] However, this definition may exclude sophisticated pilotless aircraft that are flown remotely by a highly skilled and qualified pilots. Similarly, the term RPA may well exclude an aircraft that has some characteristics

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3 This definition is used in the Canadian Aviation Regulations 1996, SOR/96-433 (CARs). Reg. 101.01(1).

4 Canada, DND, *TAA Advisory 2013-05: Continuing Airworthiness Requirements for Uninhabited Air Vehicle Systems*, 12 April 2013, ("TAA Advisory 2013-05") available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/advisories-2013-05.page, although note that the TAA abbreviates "Uninhabited Air Vehicle Systems" to UAS.

5 Carryer, *supra* n 1, at 2, available at: http://www.uavs.ca/outreach/HistoryUAVs.pdf

6 Dougherty, *supra* n 1, at 6.

of pre-programmed or autonomous flight. There is also the problem of distinguishing between ordinance such as cruise missiles, and pilotless aircraft.

The term "Unmanned Aerial Vehicle" (UAV) is widely used to describe unmanned aircraft that are used for surveillance, reconnaissance, transport, and/or the delivery of ordinance, and are capable of returning to their point of origin or some other location. The Privacy Commissioner of Canada defines UAVs as "aircraft that operate without an internal pilot, usually by remote operation through wireless signals".[7] The US Department of Defense provides a more extensive definition of UAVs:

> A powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or non-lethal payload. Ballistic or semi ballistic vehicles, cruise missiles, and artillery projectiles are not considered unmanned aerial vehicles.[8]

UAVs have today developed well beyond the early concept of a stand-alone drone or UA programmed for a single purpose or type of mission – although that may still be the case depending upon their use in a particular situation. UAVs are now part of increasingly integrated systems often comprising a number of manned and unmanned aircraft, sophisticated command and control and data processing systems, the logistical infrastructure required to deploy and sustain UAV operations, and other support resources, materiel and personnel. The term "Unmanned Aircraft System" (UAS) is widely used to describe such a system, and is defined in the US FAA Modernization and

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7 Privacy Commissioner (2014), *supra* n 1, 8.

8 US Department of Defense, *Unmanned Aircraft Systems Roadmap, 2005–2030* (Washington, DC: Office of the Secretary of Defense, 4 August 2005), 1, para 1.3.

Reform Act of 2012 as:

> [A]n unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.[9]

The US Army defines UAS even more broadly to include "communication architecture, life cycle logistics, and … the supported soldiers".[10]

In this paper "UAV" will generally be used to describe the unmanned aircraft platform as defined in the US Department of Defense definition (above), and "UAS" the aircraft platform plus the associated communication and control systems as defined in the FAA Modernization and Reform Act (above) as the context requires.

A brief history of UAV development

Early inventions, including radio control, wireless communications, and gyroscope technology were applied to military uses, including in aircraft, torpedoes and missiles in the early 20th century.[11] This paved the way for both ballistic missiles, and for modern UAV technology.

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9 FAA Moderrnization and Reform Act of 2012 (US Public Law 112-95), Title III, Subtitle B, Sec 331(9) (Definition of "Unmanned Aircraft Systems").

10 US Army, UAS Centre of Excellence, *Eyes of the Army: The US Army Roadmap for Unmanned Aerial Systems – 2010-2035*, (Fort Rucker, Alabama: UAS Centre of Excellence, 2010) ("*Eyes of the Army*"), at 2.6.

11 Privacy Commissioner (2014), supra n 1, 8-9, and see references therein, including Thomas P Hughes, *American Genesis: A Century of Innovation and Technological Enthusiasm, 1870-1970* (Chicago: University of Chicago Press, 1989), and Steven Zaloga, *Unmanned Aerial Vehicles: Robotic Air Warfare 1917-2007* (Oxford: Osprey Publishing, 2008).

Canada played a leading role in the development of UAV technology following World War II, particularly in the area of surveillance UAVs. While early developments focused on delivering explosive payloads to targets, Canadian R & D efforts concentrated on the surveillance and reconnaissance utility of UAVs that could capture, store and/or transmit tactical information of the battle space, and as the technology developed, even return to the point of origin.[12] Two companies – Canadair Corporation, and the Boeing Canada Company – made significant advances in developing UAVs for surveillance purposes and target drones respectively.[13]

Canada's R & D efforts in UAV design declined in the late 1980s as government support through procurements declined,[14] but then experienced a resurgence in the late 1990s.[15] More recently there have been a number of significant Canadian developments including testing and experimentation by the Canadian Forces Experimentation Centre,[16] the release of a Canadian Forces UAV Campaign Plan in March 2007,[17] specific military projects,[18] and domestic and expeditionary operational deployment of UAVs,[19] along with a number of commercial developments and partnerships between the private sector, government

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12 Zaloga, *ibid*, at 4.
13 Privacy Commissioner (2014), *supra* n 1, 10, and Carryer, *supra* n 1, 3-5.
14 Privacy Commissioner (2014), *ibid*, 12, and Carryer, *ibid* 4.
15 Carryer, *ibid*, 5-9.
16 *Ibid*, 5-7
17 DND, UAV Joint Program Office, *Canadian Forces UAV Campaign Plan Edition 1*, (Ottawa: DND, 2007), (available internally within DND, in RDIMS, number AEPM 1378708).
18 For example, the Land Force Intelligence, Surveillance, Target Acquisition and Reconnaissance (LF ISTAR) project: see Carryer, *supra* n 1, 7-9.
19 For example, the deployment of UASs to Kabul in 2003, to Kandahar in support of OPERATION ARCHER (2006) and OPERATION ATHENA (2005), and domestically, the 2002 deployment of the I-Gnat UAS, to provide aerial surveillance for the G-8 Summit Conference in Kananaskis: see Carryer, *supra* n 1, 5-9.

and the military.[20]

Types of UAVs and their capabilities

UAVs, can range from the size of small birds or even insects – sometimes referred to as "micro" or "nano" drones to the size of a commercial jet.[21] In the military context the Norwegian PD 100 Black Hornet, weighing only 16 gms, with a length of 16 cm, range of 1.6 km, the ability to carry various cameras and transmit imagery for up to 25 minutes, is an example of the former.[22] The US-made RQ 4A Global Hawk long-range reconnaissance UAV, at 14.5m long, 14,628 kg in weight, maximum speed of 570km/h, operating ceiling of 60,000 ft, endurance of up to 22,780km, and IMINT, SIGINT and advanced communications capabilities, is an example of the latter.[23]

The CF divides UAVs into three classes based maximum take-off weight (MTOW):[24]

- Tier 1 (Greater than 5000 lb MTOW – includes UAS classified as medium-altitude/long-endurance ("MALE") and high-altitude/long-endurance ("HALE");
- Tier 2 (186 lb to 5000 lb MTOW) – includes UAS classified as 'Tactical';
- Tier 3 (Less than 185 lb MTOW) –includes 'Micro', 'Mini' and 'Small'.

The equipment that can be carried and the functionality of UAVs has in the past been constrained by the size of the platform. However, with rapid developments in

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20 Carryer, *supra* n 1, 10-12; See also the website of Unmanned Systems Canada, the leading industry association promoting the commercial use of UAVs: https://unmannedsystems.ca

21 Jeremiah Gertler, *Unmanned Aerial Systems*, Congressional Research Service Report R42136 (Washington: CRS, 2012) for a description of various types of drones, available at https://www.fas.org/sgp/crs/natsec/R42136.pdf

22 Dougherty, *supra* n 1, 172-173.

23 *Ibid,* 109-114.

24 Canada, DND, *UAV Campaign Plan* (DND: Ottawa, March 2006) (available internally within DND, in RDIMS, number AEPM 1378708).

miniaturisation and nano-technology, these limits are rapidly being eroded.[25] Most UAVs can carry multiple cameras, with, for example, the micro-size PD100 Black Hornet mentioned above carrying three cameras giving still, low-light video and thermal imaging capability. Larger UAVs can carry an array of sensors, including still and video high-definition cameras,[26] thermal imaging,[27] multi-sensor imaging,[28] license plate readers, facial and other biometric recognition software,[29] radar emission detection and missile countermeasures,[30] laser designator equipment,[31] and sophisticated communications and SIGINT equipment.[32] The directional tasking and maneuverability of UAVs is also developing rapidly with even micro-UAVs such as the PD100 Black Hornet able to follow precise pre-programmed tracks using GPS autopilot navigation and three-dimensional capabilities.[33] Recent research and developing initiatives include UAVs that

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25 For examples of technology that can be carried by UAVs in the military context, see *Eyes of the Army*, *supra* n 10, at 2.6.2 and APPENDIX B (UAS Payloads). In the broader commercial and civil agency context see Jay Stanley and Catherine Crump, *Protecting privacy from aerial surveillance: Recommendations for government use of drone aircraft* (NY: American Civil Liberties Union, 2011), and Richard M. Thompson II, *Drones in Domestic Surveillance Operations: Fourth Amendment Implications and Legislative Responses*, Congressional Research Service Report, R43965, (Washington: CRS, 2012).

26 See, for example, the ARGUS-IS array described in Damien Gayle, "The incredible U.S. military spy drone that's so powerful it can see what type of phone you're carrying from 17,500ft," *Mail Online,* 4 April 2016, http://www.dailymail.co.uk/sciencetech/article-2269563/The-U-S-militarys-real-time-Google-Street-View-Airborne-spy-camera-track-entire-city-1-800MP.html

27 The Draganflyer X6 is an example: see, Draganflyer X6, Thermal Infrared Camera, http://www.draganfly.com/uav-helicopter/draganflyer-x6/features/ flir-camera.php

28 See, for example, "M1 zoom HD EO High Definition Drone camera UAV UAS Multicopter gimbal turret", http://www.x20.org/m1-zoom-hd-high-definition-camera-uav-uas-multicopter-gimbal-turret/

29 See Justin Lee, "Public drones equipped with facial recognition software raise privacy concerns," *Biometric Update*, 7 May 2015, http://www.biometricupdate.com/201505/public-drones-equipped-with-facial-recognition-software-raise-privacy-concerns; Clay Dillow, "Army Developing Drones that Can Recognize Your Face from a Distance," *POPSCI*, 28 September 2011, http://www.popsci.com/technology/article/2011-09/army-wants-drones-can-recognize-your-face-and-read-your-mind.

30 Dougherty, *supra* n 1, 110.

31 *Ibid*, 29-31.

32 *Ibid,* 83 (Predator), 106-114 (RQ-4a Global Hawk).

33 *Ibid,* 172-173. See also manufacturer Proxdynamics' website, http://www.proxdynamics.com/products/pd-100-black-hornet-prs.

can enter buildings and fly autonomously without a pre-programmed track.[34] Larger reconnaissance and surveillance UAVs are entering service with impressive long-range capabilities, and autonomous operational capabilities are also being developed to include "detect and avoid" systems to comply with civil aviation requirements.[35]

Applications of UAVs and UAS

Uses of UAVs and UAS in the military context include: reconnaissance and surveillance; security operations; attack; command, control and communications support; combat support; and sustainment.[36]

Government agencies and public sector applications may include law enforcement, national security agencies, border control, sovereignty operations, policing the Exclusive Economic Zone (EEZ), and search and rescue (SAR), to name but a few.[37]

Private sector and commercial applications are similarly diverse, including infrastructure inspection, communications services, natural resources monitoring, media/entertainment,

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[34] The US Defence Advanced Research Projects Agency (DARPA) is developing a UAV with advanced three-dimensional stealth capabilities to enter buildings autonomously and without GPS waypoints: US, Defense Sciences Office, Defense Advanced Research Projects Agency, "Fast Lightweight Autonomy (FLA) Program Takes Flight", 12 February 2016, http://www.darpa.mil/news-events/2016-02-12

[35] See Dougherty, *supra* n 1, 110-113. See also FAA, *Unmanned Aircraft Operations in the National Airspace System*, 72 Fed. Reg. 6689 (13 February 2007).

[36] For a full list and descriptions, see *Eyes of the* Army, *supra* n 10, 3-4, para 2.2.

[37] The various public sector, private sector and recreational applications are enumerated in the Report by the Office of the Privacy Commissioner of Canada, *Drones in Canada. Will the proliferation of domestic drone use in Canada raise new concerns for privacy* (Ottawa: Privacy Commissioner, 2013) ("Privacy Commissioner (2013)"), 4-6.

aerial mapping and GIS, environmental monitoring, property and real-estate marketing, delivery of products, and some uses of arguable legitimacy.[38]

There is high potential for the increased use of UAS for criminal activities and terrorist attacks. These uses are non-exclusive, and the range of applications of UAVs is limited only by the available technology and imagination.

[38] Including acquiring imagery of public figures and celebrities; use by private investigators, journalists and others for gathering evidence of infidelity or other illegal, socially embarrassing or culturally offensive activities; and industrial espionage.

CHAPTER 2:

HUMAN RIGHTS, PERSONAL LIBERTIES AND PRIVATE RIGHTS RELEVANT TO THE USE OF UAS

This chapter will examine relevant international instruments of which Canada is a party, and review the protections of human rights, personal liberties and private rights that must be balanced against the use of UAS in military and security operations domestically and in expeditionary operations.

International measures to protect human rights and personal liberties

Article 3 of the Universal Declaration on Human Rights (UDHR), introduced by the UN General Assembly in Paris in 1948, states that "Everyone has the right to life, liberty and security of person."[39] Canada took a central role in the drafting of this instrument in the immediate aftermath of World War 2.[40] The Declaration spawned a number of later measures including the International Covenant on Economic, Social and Cultural Rights (ICESCR) and the International Covenant on Civil and Political Rights (ICCPR) which recognize the "inherent dignity of the human person" and "the obligation of States … to promote universal respect for, and observance of, human rights and freedoms".[41] These measures include freedom of civil, religious and political beliefs, freedom from torture

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39 UN General Assembly, Universal Declaration of Human Rights, 10 December 1948, 217 A (III), http://www.un.org/en/universal-declaration-human-rights/.

40 Global Affairs Canada, "Canada's International Human Rights Policy", http://www.international.gc.ca/rights-droits/policy-politique.aspx?lang=eng.

41 UN General Assembly, International Covenant on Economic, Social and Cultural Rights, International Covenant on Civil and Political Rights and Optional Protocol to the International Covenant on Civil and Political Rights, 16 December 1966, A/RES/2200, http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx and http://www.ohchr.org/EN/ProfessionalInterest/Pages/CCPR.aspx respectively.

and inhuman treatment, and the right to privacy.[42] These rights and limitations are directly relevant to the use of UAS against a state's own citizens, or against the citizens of other countries. Canada is a party to a number of international and regional measures on human rights,[43] but a full analysis of these measures is beyond the scope of this paper.

Constitutional protections of human rights and personal liberties

Rights of "life, liberty and property" are found in the constitutional arrangements of many states, including common law jurisdictions such as the US,[44] Canada,[45] Australia,[46] and in many civil law countries.[47]

The Canadian Charter of Rights and Freedoms specifically protects the various freedoms of conscience, religion, thought, belief, opinion, expression, the press, peaceful assembly

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42 See ICCPR, Arts. 4, 6, 7, 8, 17 and 18.

43 These include (dates of ratification by Canada): the International Covenant on Economic, Social and Cultural Rights (1976), the International Covenant on Civil and Political Rights (1976) (and Protocols), the Convention on the Elimination of All Forms of Discrimination Against Women (1981) and Optional Protocol (permitting individual complaints), the Convention Against Torture (1987), the Convention for the Elimination of Racial Discrimination (1970), the Convention on the Rights of the Child (1991) (and optional Protocols), and the Convention on the Rights of Persons with Disabilities (2010).

44 See US Declaration of Independence 1776, and the US Constitution of 1787, including the Preamble and Amendments.

45 Canadian Charter of Rights and Freedoms, as Part I of the Constitution Act 1982, Arts. 2, 7, 8 & 9 ("Canadian Charter")

46 While the Australian Constitution doesn't directly protect human rights and personal liberties, it does confirm the rights to vote (s 41), of property (s 51 (xxxi)), trial by jury (s 80), freedom of religion (s 116) and prohibition against discrimination (s 117).

47 See, for example, Basic Law for the Federal Republic of Germany (1949) esp. Arts. 1 and 2 (life, liberty), 10 (privacy), and 14 and 15 (property and expropriation), https://www.bundestag.de/blob/284870/ce0d03414872b427e57fccb703634dcd/basic_law-data.pdf; Déclaration des droits de l'homme et du citoyen of 1789 (France), Arts. 1 & 2 (freedom and equality, liberty, property, security, and resistance to oppression), available at http://www.conseil-constitutionnel.fr/conseil-constitutionnel/english/constitution/constitution-of-4-october-1958.25742.html; and Constitution of the Kingdom of the Netherlands (2008) contains similar provisions in Chapter 1 "Basic Rights" including protection of life, liberty, property, privacy, freedom of association, and the right to vote, available at https://www.government.nl/documents/regulations/2012/10/18/the-constitution-of-the-kingdom-of-the-netherlands-2008.

and association.[48] Protections against unlawful arrest or imprisonment, and unreasonable search and seizure (which is highly relevant to UAS), are spelled out in specific articles.[49]

Constitutional protections such as those relating to liberties and freedoms, search and seizure, and property rights are directly relevant to the use of UAS, both in providing the constitutional background against which actions and excesses of the state are measured, and as direct causes of action in some cases. These provisions are discussed in more detail in Chapters Three (Canada) and Four (other countries) below.

Rights of Privacy

General

Against the broader principles of human rights outlined above, rights of privacy have developed as a subset of human rights internationally, and as a specific item of constitutional and legislative protection in many states. Rights of individual privacy are particularly relevant in the use of UAS for reconnaissance and surveillance, especially where individuals are the target, and/or the surveillance will result in significant intrusion into the day to day activities and privacy of individuals.

International perspective

There are many examples of early protections of privacy.[50] More recent developments

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48 Canadian Charter, Art. 2.

49 *Ibid*, Arts. 7 (life, liberty and security), 8 (unreasonable search & seizure), 9 (arbitrary detention or imprisonment).

50 See generally, David Banisar and Simon Davies, *Privacy and Human Rights: An International Survey of Privacy Laws and Practice* (Privacy International, September 2002), at fn 31 (early biblical, Greek

include Art. 12 of the UDHR states:

> No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.[51]

This is reflected in other international instruments,[52] and in decisions of the European Court of Human Rights.[53]

Constitutional protections for privacy

Many countries provide constitutional protections for individual liberty, and this often extends to personal privacy. The US courts have consistently found privacy to be constitutionally protected in the context of belief, privacy of the home, protection against unreasonable searches, and the privilege against self-incrimination.[54] Many US State constitutions recognize rights of privacy,[55] and courts have applied Fourth Amendment protections in the context of aerial surveillance by police.[56] Other countries have also

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and Hebrew references); Cao Jingchun, "Protecting the Right to Privacy in China" *Vict. U. Wellington L. Rev* 36 (2005): 645 esp at 646-647 (early Chinese references), and Justices of the Peace Act 1361 (Eng.), 34 Edw. 3, c. 1., (eavesdroppers and 'peeping toms' could be bound over to be of good behaviour).

51 In *Jones v Tsige* (2012) 346 DLR (4th) 34 at para [44] the Ontario Court of Appeal recognized that Art. 8 of the Canadian Charter accords with Art. 12 of the UDHR.

52 For example, The ICCPR (Article 17), the UN Convention on Rights of the Child (Article 16), and the European Convention for the Protection of Human Rights and Fundamental Freedoms 1950 (Article 8).

53 *X v Iceland*, [1976] ECHR 7, (1976) 5 DR 86; *Klass and ors v Federal Republic of Germany* (1979-80) 2 EHRR 214; *Malone v. The United Kingdom* 8691/79, (1984) 7 EHRR 14.

54 For example, *Griswold v Connecticut* (1965) 381 U.S. 479 (the Bill of Rights created a "zone of privacy" on personal domestic matters); *Katz v United States* (1967) 389 U.S. 347 (wiretapping).

55 See, for example, the California Constitution 1879, Art 1 §1 (privacy an inalienable rights); the Florida Constitution, 1968, Art. 1 §23 (the right to be let alone and free from governmental intrusion into a person's private life); and the Montana Constitution, 1972, Art. 2 §10 (individual privacy essential to well-being of a free society … shall not be infringed without … a compelling state interest).

56 See, for example, *Florida v Riley* (1989) 488 U.S. 445, *Chemical Co v United States* (1986) 476 U.S. 227, *California v Ciraolo* (1986) 476 U.S. 207, *United States v Knotts* (1983) 460 U.S. 276, *Kyllo v*

incorporated an explicit right to privacy in their constitutions.[57] Exemptions are normally allowed for law enforcement and in the interests of national security.

The Canadian courts have confirmed that Art. 8 of the Canadian Charter of Rights and Freedoms (the Charter) – which prohibits unreasonable search and seizure – accords with Art. 12 of the UNDHR,[58] and protects individual privacy.[59] Charter rights and privacy in the context of the use of UAS by CF in Canada will be examined in more detail in Chapter 3 (below).

Legislative privacy protection

Many countries have enacted specific privacy legislation in recent years to meet the growing threat of data theft and misuse, and the need to balance reasonable surveillance and information collection by government departments against individual and corporate rights to privacy and secrecy.[60] These will be discussed in more detail in Chapter 4 below.

In Canada the federal Privacy Act 1983 regulates the collection, use and disclosure of personal information and established the Privacy Commissioner of Canada. Canadian

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United States (2001) 533 U.S. 27, *United States v Katzin* (2013) 732 F.3d 187 (3d Cir.), and *United States v Jones* (2012) 132 S. Ct. 945.

57 For example, Art. 10 of Germany's Basic Law, (privacy of correspondence and telecommunications), and Art.13 (protection of home against search). See also the Constitution of the Federative Republic of Brazil (3rd Ed, 1988), in Art. 5 X (personal privacy), Art. 5 XI (protection of the home), and Art. 5 XII (correspondence, telephone and IT privacy

58 *Jones v Tsige* (2012) 346 DLR (4th) 34 at para [44].

59 *Hunter v. Southam Inc.* [1984] 2 S.C.R. 145 at 158-59, paras [24] and [25]; *R v Dyment* [1988] 2 S.C.R. 417 at p. 427, para [17]–[22].

60 For example, in the US: Communications Privacy Act of 1986, Stored Communications Act 1986, Health Insurance Portability and Accountability Act 1996, R. 2.1, Fair Credit Reporting Act 1971, Fair Debt Collection Practices Act 1977, and Driver's Privacy Protection Act 1994 (US); in the UK the Data Protection Act in 1998 (including establishing an Information Commissioner); and in New Zealand: Privacy Act 1993 (including establishing a Privacy Commissioner).

citizens have the right to access personal information about them held by the federal government, and can request that incorrect information be rectified.[61] Other legislation in Canada assists individuals to gain access to information held by government agencies,[62] and regulates the collection and use of personal information by the private sector.[63]

A number of provinces have also enacted legislation to protect protect privacy rights,[64] although it is likely that domestic use of UAS by CF will be immune from provincial regulation under the federal "peace, order and good government" power in Art. 91 of the Constitution Act 1867. These provisions will be discussed more fully in Chapter 3 (below).

In some jurisdictions the common law also offers protection against interferences with individual privacy, and can be more flexible than legislative measures.

Common law protection of privacy

In the US an individual's "right to be left alone" has long been recognised. The courts have developed a number of remedies over the years to protect against 'intrusion upon seclusion', and 'public disclosure of embarrassing private facts'.[65] Intrusion upon seclusion is of direct application to persistent and intrusive use of UAVs for surveillance. Similarly, the persistent surveillance by UAS that results in a detailed profile of a

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61 Privacy Act, R.S.C., c. P-21, s 12 (1983).
62 Access to Information Act, R.S.C., c. A-1 (1985).
63 Personal Information Protection and Electronic Documents Act, S.C. 2000, c.5 (2000).
64 Privacy Act 1996 (BC), Privacy Act 1978 (SK), Privacy Act 1987 (MB), Privacy Act 1990 (NL), and the Civil Code of Quebec 1991 (QB) (as well as s. 5 of the Charter of Human Rights and Freedoms 1975 (QB)).
65 Dean Prosser, "Privacy" *California Law Review* 48 (1960): 383 at 389, with detailed discussion from 389-407.

person's movements, contacts, activities and preferences, along with publication, could constitute an embarrassing public disclosure. However, the surveillance of someone from a public place where the general public can observe the same matters will not generally constitute an invasion of privacy under these torts.[66] There have been similar developments in the UK and New Zealand, and these are discussed in chapter 4 (below).

In Canada the Courts have been reluctant to sanction a stand-alone tort of invasion of privacy,[67] although there has been a gradual movement towards a stand-alone privacy tort.[68] These developments are considered in more detail in Chapter 3 (below).

The common law protections for privacy are uncertain, and deal more with intrusions affecting personal feelings and dignity. Furthermore, privacy law often does not protect – other than incidentally – against the physical intrusions of surveillance technology into or over a person's property. Traditionally the common law provides such protection through tortious remedies such as trespass and nuisance, which protect a person's property rights.

Private property rights and UAS

The physical rights that a property owner has to prevent intrusion onto their property, or into the airspace above it, are relatively settled and consistent in Canada and comparable

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66 For example, see *Boring v Google Inc.* (2009) 598 F.Supp.2d 695 (W.D. Pa.); affd. and reversed (2010) 362 Fed. Appx. 273 (3d Cir.).

67 For a good discussion of privacy in relation to the use of drones in Canada, see Paul D.M. Holden, "Flying Robots and Privacy in Canada" *Canadian Journal of Law & Technology,* (forthcoming, 2016), available on SSRN: http://ssrn.com/abstract=2571490 (8 January 2016).

68 *MacKay v Buelow* (1995) 11 RFL (4th) 403, *Dyne Holding Ltd. v Royal Insurance Co. of Canada* (1996) 138 Nfdl & PEIR 318; 135 DLR (4th) 142, at 160 per Carruthers CJ, *Somwar v McDonald's Restaurants of Canada Ltd.* (2006), 79 O.R. (3d) 172, [2006] O.J. No. 64 (S.C.J.).

jurisdictions. A landowner has rights, to a limited extent, in the airspace above his/her land.[69] The torts of trespass to land and nuisance are the main remedies a landowner has that are relevant to preventing incursions by UAS.

Trespass to land

A trespass to land is "the voluntary act of entering or remaining upon or directly causing an object or other matter to come into contact with land in the possession of the plaintiff."[70] Examples of trespass include projectiles and rock from blasting operations, water and debris, and even airborne pollutants.[71] In the classic English case of *Bernstein of Leigh (Baron) v Skyviews & General Ltd*[72] a commercial aviation company was found not to have committed a trespass in the airspace of a landowner's property as a result of overflight to take imagery of the property. The court held that any liability for trespass into the airspace above land is generally limited to the height " necessary for the ordinary use and enjoyment of land and the structures on it".[73] Other cases have found no trespass in cases where surveillance occurs, or imagery and video has been recorded, from public streets and areas outside of the boundaries of a person's property.[74] On the other hand the direct intrusion within the boundaries of a person's property, or below a height that interferes with the enjoyment of the property and structures on it, may well constitute a

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69 Expressed in the maxim *cujus est solum ejus est usque ad coelom et ad inferos* (the landowner owns everything up to the sky and down to the centre of the earth), although such rights are today severely limited by legislation and caselaw.

70 Harold Luntz, David Hambly and Robert Hayes, *Torts – Cases and Commentary*, 2nd ed. (Butterworths: Sydney, 1985), 886.

71 *Ibid*.

72 *Bernstein (Baron) v Skyviews and General Ltd* [1978] QB 479.

73 *Bernstein (Baron) v Skyviews and General Ltd* [1978] QB 479 at 488 per Griffiths J. See also *Break Fast Investments Pty Ltd v PCH Melbourne Pty Ltd* (2007) 20 VR 311 (CA)].

74 *Hickman v Maisey* [1900] 1 QB 752, *Re Penny* (1867) 7 E & B 660, *Victoria Park Racing and Recreation Grounds Co Ltd v Taylor* (1937) 58 CLR 479 at 494.

trespass.[75]

Similarly, in *United States v. Causby*[76] which concerned low altitude overflight of the plaintiff's farm by military planes, the US Supreme Court stated that a landowner "owns at least as much of the space above the ground as he can occupy or use in connection with the land" If the government or any other party intrudes into that space, such intrusions should be treated "in the same category as invasions of the surface." In that case the Judge indicated that there would be no liability had the aircraft been flying within prescribed civil aviation altitudes.[77]

The 1927 Australian case of *Davies v Bennison*, found the shooting of a cat on a neighbour's roof to be a trespass, even though the bullet didn't touch the ground. In a comment directly relevant to modern UAS, Chief Justice Nicholls stated:[78]

> If the hovering aeroplane is perfected the logical outcome of Lord Ellenborough's dictum [*Pickering v Rudd* (1815)] would be that a man might hover as long as he pleased at a yard, or foot, or an inch, above his neighbour's soil, and not be a trespasser, yet if he should touch it for one second he would be.[79]

Liability for trespass to land is usually strict and covers all natural consequences of the

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75 For example, *Sheen v Clegg* (1967) *Daily Telegraph*, 22 June 1967 (official report) (installation of microphone on private premises), *Greig v Greig* [1966] VR 376 (eavesdropping), *Lincoln Hunt Australia Pty Ltd v Willesey* (1986) 4 NZWLR 457 at 460 and *Le Mistral Inc v Columbia Broadcasting System* (1978) 402 NYS 2d 815 (television crew on commercial premises).

76 *United States v. Causby* (1946) 328 U.S. 256 (USSC) at 264-265 per Douglas J.

77 See also *Florida v Riley* (1989) 488 U.S. 445, *Chemical Co v United States* (1986) 476 U.S. 227, *California v Ciraolo* (1986) 476 U.S. 207.

78 *Davies v Bennison* [1926-27] 22 T.L.R. 52 at 56.

79 Even earlier in New Zealand in *Ryder v Hall* (1908) 27 NZLR 385 (CA), Denniston J (at 419) suggested the passage of balloons or airships over a person's land may constitute a trespass.

trespass.[80] Remedies can include injunctive relief and/or damages.[81]

Nuisance

Nuisance is traditionally defined as "the unreasonable interference with the use or enjoyment of land".[82] Today, it extends beyond direct physical intrusions of persons or things, and includes noise, smell, vibration, and other intangible and consequential interferences.[83] The tort requires a wrongful act or injury that causes significant and unreasonable interference.[84] The risk must be reasonably foreseeable, and there must be a failure to prevent it.[85]

The tort is well suited as a remedy for the effects of the use of UAS. Decided cases relevant to the use of UAS for surveillance include watching private premises, harassment, and annoying property owners through intrusion into their airspace. In the *Skyviews & General* case (above), even though the plaintiff was unsuccessful in his claim in trespass, Griffith CJ provided a useful comment on the possibility of nuisance where there is constant surveillance from the air:[86]

> I [would not] wish this judgment to be understood as deciding that in no circumstances

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80 *Wormald v Cole* [1954] 1 QB 614, *Svingos v Deacon Avenue Cartage and Storage Pty Ltd* (1971) 2 SASR 126 (FCSA). See also Stephen Todd (General Editor), John Burrows, Bill Atkin, Cynthia Hawes and Ursula Cheer, *The Law of Torts in New Zealand,* 6th ed. (Wellington: Brookers, 2013), 9.2.07(4).

81 On remedies, see Todd et al, *ibid*, at 9.2.07(5), and K Barker, P Cane, M Lunney and F Trindade, *The Law of Torts in Australia*, 5th ed. (Melbourne: OUP, 2012), 4.5.2.

82 Allen M Linden and Bruce Feldthusen, *Canadian Tort Law*, 9th ed. (Markham: LexisNexis Canada Inc, 2011), 569.

83 Todd *et al*, *supra* n 81, at 10.2.02(1) and 10.2.03(1).

84 *Harrison v Southwark and Vauxhall Water Co* [1891] 2 Ch 409 (substantial/unreasonable interference).

85 *The Wagon Mound (No 2)* [1966] 2 All ER 709 (PC) at 716-717; *Cambridge Water Co Ltd v Eastern Counties Leather Plc* [1994] 2 AC 264 (HL).

86 *Bernstein (Baron) v Skyviews and General Ltd* [1978] QB 479 at 489.

> could a successful action be brought against an aerial photographer to restrain his activities. The present action is not founded in nuisance for no court would regard the taking of a single photograph as an actionable nuisance. But if the circumstances were such that a plaintiff was subjected to the harassment of constant surveillance of his house from the air, accompanied by the photographing of his every activity, I am far from saying that the court would not regard such a monstrous invasion of his privacy as an actionable nuisance for which they would give relief.

Trespass and nuisance may not be available where a UAS is operating in accordance with civil aviation regulations, where it is authorised by statute,[87] and/or where there is a legitimate public interest justification such as law enforcement and anti-terrorism operations.[88]

Other common law options

Other remedies available under the common law include trespass to the person and assault, negligence where property damage or personal injury results from use of UAS, intentional infliction of emotional distress, breach of confidence, infringement of copyright, breach of contract, defamation, malicious falsehood, and criminal offences. Reference to the standard texts may be made for these remedies.

The next chapter will examine in detail the applicable law and policy governing the use of UAS within Canada; in Canada's adjacent airspace and maritime domain, in international waters and airspace, and within host nations and conflict zones as part of expeditionary operations. It will identify strengths and weaknesses of current law and policy.

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87 For example, *Allen v Gulf Oil Refining Ltd* [1981] AC 1001, *Varnier v Vector Energy Ltd* [2004] NZRMA 193.

88 See discussion of such defences in the discussion of 'Privacy' above at pp 17-20.

CHAPTER 3:

THE USE OF UAS BY THE CANADIAN FORCES

To provide order to this analysis, the use of UAS will be considered in the context of CF operations within three zones:

1. *Territorial sovereignty zone*: Canada's land areas, and the 12 nm territorial sea (TS);
2. *Extraterritorial zone*: Canada's 12-24 nm "contiguous zone" (CZ), its EEZ and the Continental Shelf (CS), the high seas, and the Arctic Ocean; and thirdly,
3. *Expeditionary operations*: As a part of UN, NATO, or other individual, combined or coalition operations in which Canada is involved.

As already mentioned, the analysis will be confined to the *sense* domain. This chapter will first review the roles of the CF, and the concept of territorial sovereignty and its extent at international law. This will be followed by an analysis of the legal status and jurisdiction of Canada and the CF to conduct operations in the three zones mentioned. The law and policy issues regarding the use of UAS in each of the zones will be examined in detail, and strengths and weaknesses of the current approaches identified.

The roles of the CF

The *Canada First Defence Strategy*[89] specified six major roles of the CF:

- Conduct daily domestic and continental operations, including in the Arctic and through NORAD;

[89] DND, *Canada First Defence Strategy* (Ottawa: DND Canada, 2008), at 3 and 10.

- Support a major international event in Canada, …;
- Respond to a major terrorist attack;
- Support civilian authorities during a crisis in Canada such as a natural disaster;
- Lead and/or conduct a major international operation for an extended period; and
- Deploy forces in response to crises elsewhere in the world for shorter periods.

The first four of these roles contemplates the CF conducting at least some of their operations domestically. The last two, although primarily involving expeditionary deployment on military operations, may also involve significant domestic activity, including training, sustainment, intelligence collection and analysis, and deployment of air, land and sea elements through Canadian domestic territory and adjacent zones.

The Canadian Joint Operations Command (CJOC) is the primary operational command authority for the CF, and "is responsible for conducting full-spectrum CF operations at home, on the continent of North America, and around the world".[90] Key CJOC roles include:[91]

- Operational command of all land, air and maritime units;
- Cooperation with NORAD;
- Tactical control of all Canadian Forces (less CANSOFCOM and NORAD) for force protection;
- Planning authority with USNORTHCOM, NORAD and other US Combatant Commands, and Mexican Military Authorities as required; and
- Planning authority with all Canadian federal, provincial and territorial agencies

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[90] See Canada, Canadian Joint Operations Centre website, at http://www.forces.gc.ca/en/about-org-structure/canadian-joint-operations-command.page.

[91] *Ibid*. For a useful description of the standing up of CJOC on 5 October 2012 and its current structure and functions, see RAdm Peter Ellis, "CJOC and Phase Zero" *Frontline Defence* 11, no. 4 (2014): 18, http://defence.frontline.online/article/2014/4/154-CJOC-and-Phase-Zero

involved in all forms of emergencies, including security.

The CF does not have *carte blanch* to operate in all domains of land, air and sea. A number of international and domestic legal constrains apply. The next section will examine the concept of territorial sovereignty, and the international legal principles that delineate Canada's territorial and extra-territorial jurisdiction.

Territorial sovereignty

The Montevideo Convention of 1933 defines a "state" as an entity having: "(a) a permanent population; (b) a defined territory; (c) government; and (d) capacity to enter into relations with other States".[92] While the Convention regards the primary interest of states as the "the conservation of peace" and encourages peaceful settlement of differences,[93] it also recognizes that:

> [T]he state has the right to defend its integrity and independence, to provide for its conservation and prosperity, and consequently to organize itself as it sees fit, to legislate upon its interests, administer its services, and to define the jurisdiction and competence of its courts. The exercise of these rights has no other limitation than the exercise of the rights of other states according to international law.

It follows that a state has exclusive jurisdiction over its landward, seaward and airspace "territory" and may legitimately use its military and government agencies to defend that territory. The precise limits of state jurisdiction are well settled in respect to a state's adjacent maritime zone. Vertical sovereignty is more complex given the many agreements

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92 Montevideo Convention on the Rights and Duties of States 1933, 165 LNTS 19; 49 Stat 3097, Art. 1.
93 *Ibid*, Art. 10

and shared responsibilities of states for civil aviation. Boczek states the problem:[94]

> The issue whether it is possible or useful to establish a legal boundary between airspace and outer space has been debated in the doctrine for quite a long time. . . . no agreement exists on a fixed airspace - outer space boundary . . .
>
> Moreover, an undefined upper limit of the airspace serves better national security considerations of states concerned about surrendering potential sovereign rights to the airspace when future technology allows the attainment of higher altitudes.

One possible measure is the point at which the atmosphere transitions to "outer space", which according to the Fédération Aéronautique Internationale (FAI) is at 100 km (62 miles) above the Earth's surface.[95] The United States considers this point to be lower 80 km,[96] but neither measure has any basis in international law.[97] It follows that a state can exercise its rights to defend itself against threats to its sovereignty to such height as appropriate, provided it does not infringe the rights of other states at international law.

The current source of maritime territorial boundaries is the United Nations Convention on the Law of the Sea (UNCLOS), which came into force in 1994.[98] UNCLOS has been signed and ratified by 167 states (including Canada), and the European Union. It is largely a codification of pre-existing international law and agreements relating to

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94 Boleslaw Adam Boczek, *International Law: A Dictionary* (Lanham, Maryland: Scarecrow Press, 2005), 239.

95 This is referred to as the "Karman line" based on the work of Theodore von Kármán (1881–1963), an engineer and physicist who calculated that around this altitude the atmosphere is too thin to support aeronautical flight: see S. Sanz Fernández de Córdoba. "The 100 km Boundary for Astronautics" Fédération Aéronautique Internationale website, 24 June 2004, available at http://www.fai.org/icare-records/100km-altitude-boundary-for-astronautics.

96 James E. Oberg, *Space Power Theory* (Colorado Springs: US Air Force Academy, 1999) at 80.

97 For a useful discussion of airspace sovereignty, see Robert E. White, "Space Weapons Ban: Thoughts on a New Treaty" extracted from "Preserving Space for Peaceful Use: A Case for a New Space Treaty, Centre for Peace Studies", University of Auckland, Working Paper No. 10, July 2001, ISBN 0-908881-17-7, http://web.archive.org/web/20080515202422/http://www.inesap.org/bulletin20/bul20art08.htm#extract.

98 United Nations Convention on the Law of the Sea 1833 UNTS 3 (opened for signature 10 December 1982, entered into force 16 November 1994) ("UNCLOS"). Note Part II, Section 2, Art. 4, which defines the 12 nm territorial sea.

territorial boundaries, sovereignty, jurisdiction and management of the seas.

Under UNCLOS the seas that surround a coastal state are divided into:

- Internal waters – full territorial sovereignty;
- Territorial Sea (12 mile limit) – full territorial sovereignty;
- Contiguous Zone (12-24 nm limit) – not full sovereignty, but partial jurisdiction under customs, fiscal, immigration or sanitary laws;
- Exclusive Economic Zone (EEZ) (low water mark to 200 nm) – "sovereign rights" to control access to fisheries and other marine resources
- Continental Shelf (CS) – "sovereign rights" to control access to seabed and sub-seabed mineral resources to the extent of the continental shelf including where it extends beyond the 200 nm EEZ;[99]
- High Seas – areas beyond 12 nm territorial sea and not part of another state's territorial sea.

A more detailed summary of the various maritime zones under UNCLOS is included as APPENDIX 1.

The specific legal regime that applies to the use of UAS by CF in the various zones will now be examined in detail. The first three UNCLOS zones will be discussed together as part of the "domestic territorial sovereignty" zone, and in the context of "expeditionary operations"; and the other three as part of the "extraterritorial" zone.

UAS may be deployed by any of the arms of the CF, including Army, Air Force, Navy and Special Forces. As this paper is concerned with the law and policy that applies to the *effects* of the use of UAS, the CF will be treated generically and no distinctions will be

[99] The "Continental Shelf" (CS) is the subject of the separate Convention on the Continental Shelf of 1958, and Part VI of UNCLOS.

made between the different arms.

The use of UAS by CF in the domestic 'territorial sovereignty' zone including over land

Under s 4 of the Oceans Act 1996, Canada asserts sovereignty to the 12 nm TS extending outwards from the "baseline" (generally the low water mark). The land areas of Canada, its internal waters, and the bed of the TS are part of the sovereign territory of Canada, and all Canadian laws apply in full measure to this zone.[100] Within the TS vessels of other states enjoy a right of "innocent passage".[101]

The area of ocean outside the TS limit is considered the "high seas". All vessels may exercise freedom of navigation,[102] but subject to any legitimate rights that Canada has to control certain activities in the CZ, and access to resources within its EEZ or the CS.[103] Innocent passage is also guaranteed through internationally recognized sea lanes.[104] Warships operating on the high seas have immunity from the jurisdiction of other states, except that they cannot infringe their rights at international law.[105]

Command and control of the CF in the domestic territorial zone

Historically there has been a relatively clear divide between the jurisdiction of military and civil authorities within Canada's own territory. Matters of domestic law enforcement,

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100 Oceans Act, S.C. 1996, c. 31, ss 6-8 (1996).
101 Defined in Part II, Art.19(1) of UNCLOS as "Passage [that] is not prejudicial to the peace, good order or security of the coastal State."
102 Geneva Convention on the High Seas 1958, Art. 1, and UNCLOS, Part VII, Arts 86 and 87.
103 See UNCLOS, Part V, Arts. 58 and 73, and Part VI, Arts. 77 and 78.
104 UNCLOS, Part IV.
105 Geneva Convention on the High Seas 1958, Art. 8.

security, natural disaster management, health crises, and maintenance of national and regional infrastructure were traditionally the responsibility of civil agencies with the military only mobilized in emergencies. In recent years with larger and more mobile populations, law and order challenges, environmental threats, and the spread of terrorism, the domestic role of the military has expanded.

With these increased responsibilities, and the "whole of government" approach to such operations, [106] there are increasing uses for military UAS within Canada for reconnaissance and surveillance, both for military operations, and in support of public and civil agencies in domestic emergencies.[107] These may include "natural and human-induced hazards ... fires, floods, oil spills, the release of hazardous materials, transportation accidents, earthquakes, hurricanes, tornadoes, health or public health disorders, disease outbreaks or pandemics, major power outages, cyber incidents, and terrorism". [108] Recently the CF has also been expressly tasked to support the Communications Security Establishment.[109]

Canadian Joint Operations Command (CJOC) is in a supporting role for all domestic operations except defence and SAR, where it is the primary agency. The federal guiding

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106 DND, *CFJP 01: Canadian Military Doctrine* (Ottawa: DND, 2009) ("CFJP 01"), paras [0615] (whole of government approach) and [0637]-[0640] (Domestic Operations).

107 Public Safety Canada, *Building Resilience Against Terrorism: Canada's Counter-Terrorism Strategy* (Ottawa: Public Safety Canada, 2012), at 19, http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/rslnc-gnst-trrrsm/index-en.aspx.

108 Public Safety Canada, *Federal Emergency Response Plan* (Ottawa: Public Safety Canada, 2011) ("FERP"), at para 1.5. For a full list of CF functions see DND, *B-GJ-005-302/FP-001, CFJP 3-2 - Domestic Operations* (Ottawa: Commander, Canada Command, 2011-12) (("CFJP 3-2"), at 4-1. See also DND, *Standing Operations Order for Domestic Operations,* Draft. (Ottawa: Commander, Canada Command, February 2012) ("SOO Domestic Operations").

109 National Defence, R.S.C., c. N-5, s 273.65(6) (1985).

concept for domestic operations is "to harmonize federal emergency response efforts with those of the provinces/territorial governments, non-governmental organizations, and the private sector".[110]

The Federal Emergency Response Plan (FERP) provides a hierarchical strategic and operational policy and planning structure.[111] Canadian Reserve Forces can be utilised in domestic operations, and this can include compulsory service in emergencies such as insurrection, riot, invasion, armed conflict or war,[112] and in the case of aid for the civil power.[113] When the CF is mobilized to assist the civil power and law enforcement agencies, members of the CF acquire some of the powers and immunities of law enforcement officers.[114]

There is potential for extensive involvement of the CF in domestic operations. Uses most directly related to the use of UAS by CF in domestic operations include ISTAR[115] contributions to NORAD; long endurance coastal and offshore surveillance (including the Arctic Ocean) for security and resource protection purposes;[116] aerial and geophysical survey, mapping and event detection; monitoring, detecting and countering CBRN

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110 FERP, *ibid*, at paras 1.2.

111 FERP, *ibid*. There is also a comprehensive Maritime Emergency Response Protocol (MERP) with a similar structure: https://www.tc.gc.ca/eng/marinesafety/em-env-menu.htm.

112 National Defence Act, R.S.C., c. N-5, s 31(1), 33(2), (3) and (4) (1985); and see SOO Domestic Operations, *supra* n 107, at 3/33 – 4/33, Appendix 1, Annex HH.

113 National Defence Act, R.S.C., c. N-5, s 275 (1985).

114 See CFJP 3-2, at ch 6, Sections I and II. Such authority includes the *CF Assistance to Provincial Police Forces Directions*, and subsection 273.6(2) of the National Defence Act, R.S.C., c. N-5, (1985). While CF members have the powers of constables, they do not replace the civilian authorities, but assist them to restore and maintain law and order.

115 Intelligence, surveillance, target acquisition and reconnaissance.

116 See Levon Bond, "*JUSTAS* and *PROJECT EPSILON*: Integrated Intelligence, surveillance, and Reconnaissance of the Canadian Arctic" *Canadian Military Journal* 11, no. 4 (2011): 24, Colin Kenny, "Canada needs fighter jets and drones to defend its borders," *Financial Post,* 28 February 2012, Paul Koring, "In the Arctic, drones could close the gap," *The Globe and Mail,* 9 July 2012.

threats; providing surveillance, communications and imagery support to civil law enforcement agencies; and assisting with national emergency responses with communications, imagery and potentially logistical support. The legal and policy considerations of such uses will now be addressed.

The use of the domestic airspace by military UAS

The federal government has primary jurisdiction to regulate the use of aircraft, including UAVs, in Canada,[117] and the Aeronautics Act 1985 and the Civil Aviation Regulations (CARs) made under the Act, govern civil and private aviation. Transport Canada (TC) is the responsible agency. While the Aeronautics Act binds the Crown,[118] and contains no statutory exemption to the CF from its provisions, the CARs issued under it specifically provide that they do not apply to:[119]

> (a) military aircraft of Her Majesty in right of Canada when they are being manoeuvred under the authority of the Minister of National Defence;
>
> (b) military aircraft of a country other than Canada, to the extent that the Minister of National Defence has exempted them from the application of these Regulations pursuant to subsection 5.9(2) of the Act; …

Thus, to the extent that a military UAS is operating under the authority of the Minister of National Defence (MND), domestic civil aviation regulation has very limited application.[120] The precise wording of CAR 102.01, however, suggests that if military UAS were to be "maneuvered under the authority of" other agencies, such as the police,

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117 Constitution Act 1867, s 91, confirmed in *Quebec (Attorney General) v. Canadian Owners and Pilots Association* [2010] 2 SCR 536, 2010 SCC 39.

118 Aeronautics Act, R.S., c. A-2, s 2 (1985).

119 CARs, Reg. 102.01 (a) and (b).

120 David Pugliese, "DND concludes it does not need permission to fly drones in domestic airspace, despite 'greater challenges'" *Financial Post*, 25 January 2013.

they may become subject to the CARs. The contrary argument may also be made that if the MND has tasked military UAS to assist the police, they are still be under the MND's 'authority' and therefore exempt from the CARs. This is an area of considerable uncertainty and should be clarified in the CARs.

Both TC and the DND have indicated that they will take a collaborative approach in managing the military and civilian use of UAS, and there is an expectation by TC that military operations involving UAS in civil airspace will be coordinated with NAV CANADA and TC.[121] Note that this is a staff instruction and does not have the force of law.

The technical design and airworthiness of military UAS in Canada is provided for by the DND through the Technical Airworthiness Authority (TAA).[122] The TAA also produces Advisories for the operation of UAS both within military restricted airspace in Canada, and in international waters.[123] The TAA's Technical Airworthiness Program for military aircraft is based on "the philosophy, principles and concepts used by civilian and military airworthiness authorities worldwide".[124] However, there appears to be no independent

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121 Transport Canada, *SI 623-001-02: Review and Processing of an Application for a Special Flight Operations Certificate for the Operation of an Unmanned Air Vehicle (UAV) System*, Staff Instruction, 19 November 2014, ("SI 623-001-02"), at para 3.5(1)(a).

122 DND, *TAA Advisory 2013-05: Continuing Airworthiness Requirements for Uninhabited Air Vehicle Systems*, 12 April 2013, ("TAA Advisory 2013-05") available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/advisories-2013-05.page

123 For example, DND, *TAA Advisory 2014-02: Technical Airworthiness Clearance Requirements for Tier 3 Uninhabited Air Vehicle Systems – Type Design and Aeronautical Product* (June 2014), ("TAA Advisory 2014-02") available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/advisories-2014-02.page.

124 DND, National Defence and the Canadian Armed Forces, "About the Technical Airworthiness Authority", available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/about-taa.page. See also See also TAA, *C-05-005-001/AG-001: Technical Airworthiness Manual,* available at http://www.forces.gc.ca/en/business-regulations-technical-

regulatory benchmarking of the TAA Advisory, and little accountability outside the DND. The Aeronautics Act 1985 does contain extensive provisions governing military investigations into aeronautical incidents and accidents involving military aircraft or installations and civilians,[125] but again these are conducted largely under the direction of military agencies.

Notwithstanding the TAA Advisory on UAS, the military exemption from the CARs potentially impacts upon civil aviation safety where military UAS are deployed domestically and are using the same airspace as civilian and recreational aircraft. It is not the approach of other similar jurisdictions such as the US and the UK, where military aircraft are generally subject, to a greater or lesser extent, to civil aviation regulation.[126]

To the extent that the CARs may apply to military UAS operating in civil airspace – either where a military UAS is operating under the authority of another agency such as police, or by a subcontractor to the CF – it is appropriate to consider the rules that apply. The CARs do not generally apply to smaller model aircraft, rockets, hovercraft or wing-in-ground-effect machines,[127] although operators must be at least 18 years old, and the UAV must be operated in line of sight, during daylight and in good weather. UAVs must not be operated within 9 km of an airport or aerodrome; above 90 m altitude; within 150 m of people, animals, buildings or vehicles; in populated areas; near moving vehicles and

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airworthiness/technical-airworthiness-manual.page, and TAA, *C-05-005-001/AG-002: Airworthiness Design Standards Manual*, available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/design-standards-manual.page

125 Aeronautics Act, R.S., c. A-2, Part II (1985).

126 Discussed below in Chapter 4.

127 CARs, Reg. 102.01(c).

roads; or within restricted airspace such as military bases and prisons.[128]

The CARs apply to recreational UAVs of 35 kg or larger (as these are not within the definition of "model aircraft"), and any UAV used for commercial purposes. For these types of UAVs the operator must apply to TC for a Special Flight Operations Certificate (SFOC),[129] including comprehensive details about the operator; purpose, the parameters and route of operation; and insurance coverage.[130] Applying for a SFOC the first time can be arduous, but subsequent applications may be easier for operators with a successful operating history.[131] Between 2010 and 2014, TC issued 3,199 approvals for UAV operations – a logarithmic increase from levels five years previously.[132]

As can be seen in Figure 1 (below), there are exemptions from the requirement for a SFOC for commercial UAVs of up to 2 kg, and for UAVs above 2kg and up to 25 kg in weight. To qualify for an exemption for the former, the operator must comply with 37 conditions, including an "appropriately trained" operator, operated only in daylight and in line of sight, and carrying $100,000 liability insurance. The UAV must be operated only in Class G (uncontrolled) airspace, below an altitude of 300 ft, outside military or other restricted airspace, and not within: 5 nm of any aerodrome or built up area; 100 feet of

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128 SI 623-001-02, at Paras. 8.0-11.7, and Appendices B-D, G-I. See also Transport Canada, "Do's and Don'ts for Flying Your Drone Safely and Legally", T86-6/2014E-PDF, available at http://www.tc.gc.ca/media/documents/ca-standards/Info_graphic_-_Dos_and_Donts_for_flying_your_drone_safely_and_legally.pdf

129 CARs, Reg. 602.41, 603.65-67, 623.65(d).

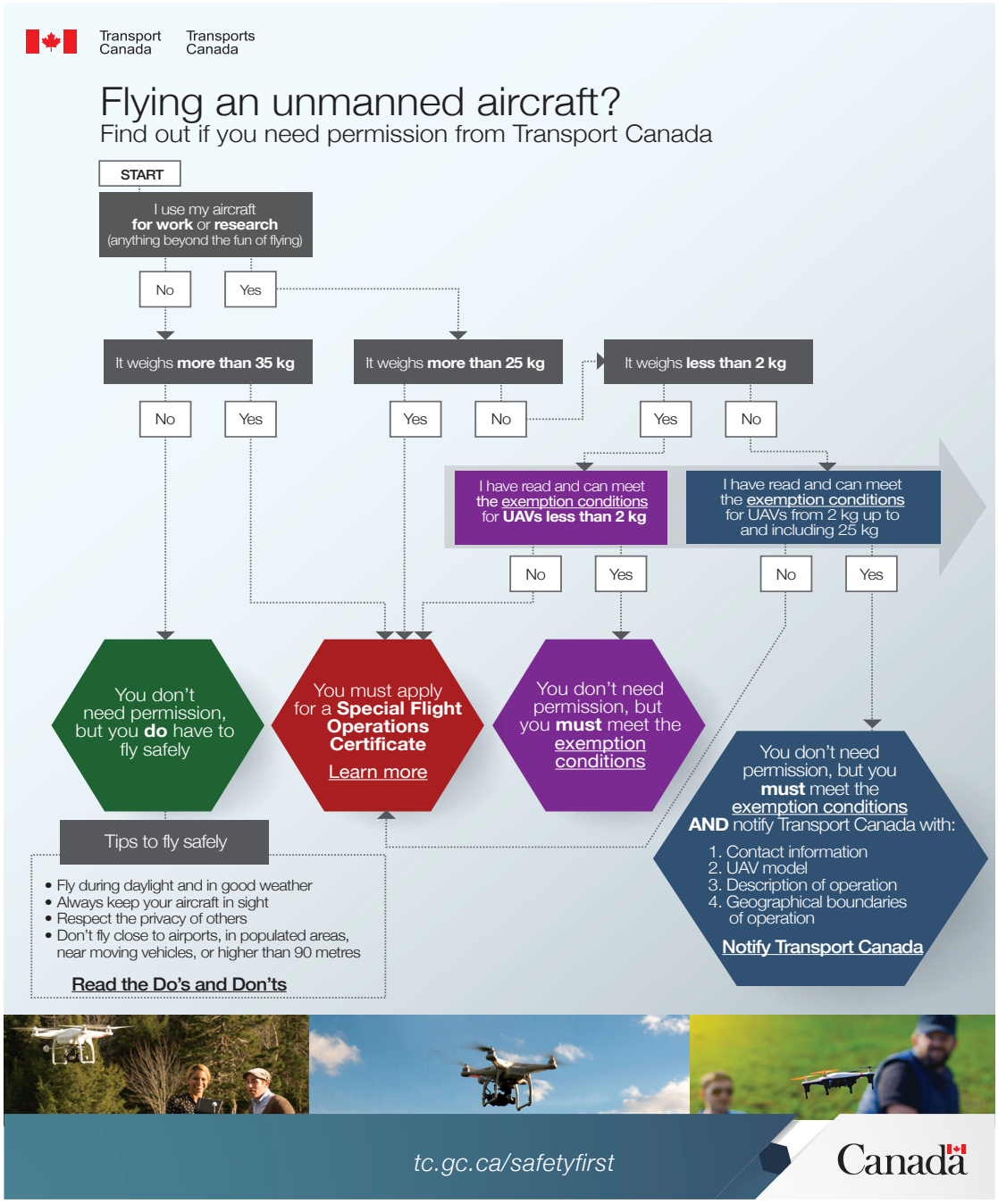
130 CARs, Reg. 623.65(d). Insurance coverage required is detailed in the CARs, Reg 606.02.

131 SI 623-001-02, at 7.2.

132 Transport Canada website, FAQs, available at http://www.tc.gc.ca/eng/civilaviation/standards/general-recavi-uav-2265.htm?campaign=2014-uav-socialmedia-facebook&WT.mc_id=hruzf#safety See also Holden, *supra* n 67, at 6. Between 2007 and 2012, only 293 SFOCs were issued: Martin F. Sheehan and Michael Parrish, "Regulation of Unmanned Aerial Vehicles ("Drones") in Canada", Fasken Martineau Litigation and Dispute Resolution Bulletin (Fasken Martineau DuMoulin: Montreal & Vancouver, 2015), available at http://www.fasken.com/drones-canada/

any structure, vehicle, vessel, animal or person; or over an assembly of people.[133]

Figure 1: Transport Canada Flow Chart for UA operation.[134]



133 Transport Canada, *Guidance Material for Operating Unmanned Air Vehicle Systems under an Exemption*, Advisory Circular AC 600-004, 27 November 2014, para 1.3(1)(a) and Appendix A.

134 Transport Canada, website at http://www.tc.gc.ca/media/documents/ca-standards/Info_graphic_-_Flying_an_umanned_aircraft_-_Find_out_if_you_need_permission_from_TC.pdf.

UAVs between 2 kg and 25 kg, must satisfy 59 special conditions to be exempted, including[135] an extended separation of 500 ft from buildings, structures, vehicles, vessels, animals or members of the public, and "pilot ground school" training.[136]

In both cases there are prohibitions against carrying any explosive, corrosive, or bio-hazard material, or laser payloads, and with the larger exempted UAV there is an additional prohibition against carrying any payloads that can be "jettisoned, dispersed or dropped".[137] While these prohibitions are intended to address the use of UAVs for criminal activities, protests or terrorism, they would clearly have little effect against a determined belligerent.

An operator of a UAV does not need to be licensed, or even have a high level of training. The CARs simply require operators to be "appropriately trained", and the knowledge requirements are vague, and can be self-taught. In 2014 some guidance on formalized training was issued as "best practice" guidance to assist Transport Canada decision-makers in issuing SFOCs. While these requirements are not yet included in CARs, the training will be expected of applicants who wish to qualify as "compliant operators" in order that their applications can be expedited more quickly.[138]

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135 *Ibid*, para 1.3(1)(a) and Appendix B.
136 *Ibid*, Appendix B, para 47.
137 *Ibid*, at Appendix A, para 34, and Appendix B at para 42.
138 Transport Canada, *TP 15263E: Knowledge Requirements for Pilots of Unmanned Air Vehicle Systems UAV 25 kg or less, Operating within Visual Line of Sight*, First Edition (Ottawa: TC, August 2014), available at http://www.tc.gc.ca/eng/civilaviation/publications/page-6557.html#general_information

There are penalties under the Aeronautics Act 1985 for breach of that Act and CARs,[139] and for criminal acts and acts of terrorism, ranging from monetary fines to extended terms of imprisonment.[140]

In summary, the regulation of the use of military UAS in Canada is unsatisfactory in a number of areas. First, military UAS operations appear to be largely exempt from civil aviation regulations. The extent to which the CF must coordinate their UAS operations with Transport Canada and NAV CANADA when in civilian airspace is unclear and not the subject of mandatory regulation. Further, CF UAS may be offered to other agencies such as the RCMP or police, and it is unclear then whether the exemption still applies. The CF may also engage private contractors, as has been done in Afghanistan, to provide UAS services for surveillance and reconnaissance. Again, it is unclear whether operations by civilian contractors would be covered by the exemption. Liability of CF personnel will depend upon whether the exemption applies in any particular case or not, and any contravention of the Aeronautics Act 1985 and CARs through unlawful use of UAS by CF personnel could attract financial penalties, and possibly even imprisonment. Another problem is the lack of formal training requirements for operators of UAS. Finally the potential for UAS to be used for criminal activities and terrorist attacks appears not to be fully appreciated, and recent measures allowing exemptions from SFOC procedures for operation of UAVs of 25 kg or less further enables the unregulated use of UASs in Canadian civil airspace.

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139 See, for example, Aeronautics Act, R.S., c. A-2, s 7.3 (1985), and see Sheehan and Parish, *supra* n 132.

140 See Criminal Code 1985, R.S.C., c. C-46, Parts II (offences against public order), esp s 76; II.1 (Terrorism), esp s 83.18; III (firearms and other weapons); VIII (offences against the person), esp ss 215 (preservation of life), 219 (criminal negligence), 222 (homicide), 229 (murder), 249(1)(c) (using aircraft in a manner that is dangerous to the public); XIII (Attempts, conspiracies).

The Charter and use of UAS

The Charter contains a number of constitutional guarantees including freedom of religion; freedom of thought, opinion and expression; freedom of the press and communication; freedom of peaceful assembly; and freedom of association.[141] Article 7 expressly protects life, liberty and security of persons, and Art. 8 prohibits unreasonable search and seizure.[142] Any citizen can take legal action in the Canadian courts to enforce those rights and seek redress.[143] The use of UAS for surveillance within Canada, and against Canadian citizens, activates these right, with the main battlegrounds to date being unlawful search and seizure and infringements of privacy.

Balanced against this is the recent Anti-terrorism Act 2015[144] that places some constraints on civil liberties and personal freedoms in the interests of combatting terrorism. The measure would provide some justifications for use of UAS by the CF within Canada in support of these measures.[145] As noted above, there are significant penalties, including fines and imprisonment, for planning or committing acts of terrorism in Canada.

The Charter and Privacy

In *Hunter v. Southam Inc.*[146] Dickson J. considered that Art. 8 of the *Charter* constituted an independent "entitlement to a reasonable expectation of privacy" although subject to

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141 Charter, Art. 2.

142 *Ibid*, Arts. 10-15 provide further elaboration of rights. Exceptions to Arts. 2, and 7-15 may be provided for through legislation enacted by federal or provincial parliaments, but the exceptions are limited to 5 years unless re-enacted: Art. 33.

143 *Ibid*, Art. 24.

144 Anti-terrorism Act, S.C., c. 20 (2015).

145 Note that the CF are now expressly required to support the Communications Security Establishment: National Defence Act, R.S.C., c. N-5, s 273.65(6) (1985).

146 *Hunter v Southam Inc.*[1984] 2 S.C.R. 145.

"the government's interest in intruding on the individual's privacy in order to advance its goals, notably those of law enforcement."[147]

In relation to the Charter, the courts have recognised three distinct types of privacy interests:[148]

- Personal privacy (including bodily integrity);
- Territorial privacy (including the home and other places people have a reasonable expectation of privacy); and
- Informational privacy (including commecial information, private communications and correspondence).

R v Tessling[149] is of direct relevance to the deployment of UAS for surveillance. In that case the Supreme Court of Canada had to consider whether the use by the RCMP of an aircraft equipped with thermal imaging equipment in order to detect heat emissions from the defendant's home was a breach of Art. 8 of the *Charter*. The RCMP did not have a warrant to use the thermal imaging equipment for surveillance of the home, but the information obtained allowed the police to get a warrant to search the premises, and a quantity of cannabis and weapons were found. The Court considered that the overflight did not violate the defendant's constitutional rights against unreasonable search and seizure provide by Art. 8 of the *Charter*. The thermal imaging equipment could only detect external emissions of heat from buildings, and this was information that offered "no insight into [the Defendant's] private life, and reveals nothing of his 'biographical

147 *Ibid*, at 158-59, paras [24] and [25]. See also *R v Dyment* [1988] 2 S.C.R. 417 at p. 427, para [17] (importance of privacy for the individual and for public order).

148 See *R v Tessling* [2004] 3 S.C.R. 432, at paras [19]-[23] per Binnie J for the Court; *Jones v Tsige* (2012) 346 DLR (4th) 34 at para [41].

149 *R v Tessling* [2004] 3 S.C.R. 432.

core of personal information'."[150] The equipment, at the stage of development at the time, could not see into a building, nor could it allow inferences of precise activities occurrring within the building. Justice Binnie did, however, leave the door open for future *Charter* challenges should surveillance technology progress to a stage where it could in fact see into a building from the outside, or allow insights into a person's private life, or reveal 'biographical core information':[151]

> In my view, with respect, the reasonableness line has to be determined by looking at the information generated by existing FLIR technology, and then evaluating its impact on a reasonable privacy interest. If, as expected, the capability of FLIR and other technologies will improve and the nature and quality of the information hereafter changes, it will be a different case, and the courts will have to deal with its privacy implications at that time in light of the facts as they then exist.

These comments are directly relevant to the use of UAS by CF, as the *Charter* comes fully into play where there is a state action. They should be borne in mind by DND and CF commanders when tasking CF surveillance assets such as UAS.

Canadian privacy laws

In Canada the federal Privacy Act 1983 regulates the collection, use and disclosure of personal information by government agencies.[152] The Privacy Act applies to around 250 federal government departments, agencies and entities, who are required to complete "Privacy Impact Assessments" where they wish to collect or amend any personal information for administrative purposes.[153] When information is collected the individual

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150 *Ibid*, at para [63].
151 *Ibid*, at para [29], per Binnie J for the Court.
152 For a useful discussion of the Privacy Act in the context of UAV use, see Privacy Commissioner (2014), supra n 1, 49-51.
153 Treasury Board of Canada Secretariat, *Directive on Privacy Impact Assessment* (Ottawa: Govt. of Canada, 2010) (effective April 1, 2010); Office of the Privacy Commissioner of Canada,

should be informed of the reasons.[154] The use of information is generally restricted to the original purpose of collection,[155] and it cannot be disclosed to others.[156]

The Act also established the Privacy Commissioner of Canada who can audit government institutions for compliance with the Act. The Commissioner is required to investigate complaints by individuals on misuse of their personal information.[157] The Privacy Commissioner has no powers of compulsion or enforcement except in the case of obstruction,[158] although a negative report and public scrutiny can embarrass the government.[159]

The Access to Information Act 1985 gives citizens and permanent residents the right of access to information held by federal government institutions. The Freedom of Information Act 1996 provides a further evolution of access to information held by government institutions, and rights to correct information.

The Personal Information Protection Electronic Documents Act 2000 (PIPEDA) governs collection and use of personal information by a "private sector entity" in the course of its commercial activities.[160] Personal information is defined as "information about an

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Expectations: A Guide for Submitting Privacy Impact Assessments to the Office of the Privacy Commissioner of Canada (Ottawa: Govt. of Canada, 2011) available at https://www.priv.gc.ca/information/pub/gd_exp_201103_e.pdf

154 Privacy Act, R.S.C., c. P-21, s 5(2) (1983).

155 *Ibid*, s 7.

156 *Ibid*, s 8.

157 *Ibid,* s 29.

158 *Ibid*, s 68.

159 Bruce Phillips, Privacy Commissioner of Canada, "The Evolution of Canada's Privacy Laws", Speaking notes prepared for the Canadian Bar Association - Ontario Institute 2000, January 28, 2000, Toronto, Ontario, https://www.priv.gc.ca/media/sp-d/archive/02_05_a_000128_e.asp

160 Personal Information Protection Electronic Documents Act, S.C., c. 5 (PIPEDA), ss 3 and 4 (2000).

identifiable individual", and the Federal Court has determined that this may include information that does not itself identify an individual, but may in association with other information or data, lead to such identification.[161] This has particular relevance to the use of UAS.

Of particular relevance to UAS is the problem of over-collection of data and imagery – what is called "shutter control" in military camera usage. The Office of the Privacy Commissioner has produced guidelines for "overt" video surveillance by the private sector, including developing clear policy for video surveillance, ensuring surveillance is only for the purposes authorised, limiting the use and video range of cameras as much as possible, storing imagery in a secure place, and destroying imagery when it is no longer required.[162] Similar guidelines could well be considered by the CF when using UAS for overt surveillance.

Another problem is the lack of awareness by an individual that personal information has or is being collected, given that enforcement under the Act relies upon an individual filing a complaint.[163]

At the provincial level, British Columbia, Saskatchewan, Manitoba and Newfoundland and Labrador have all enacted Privacy Acts, and Quebec a Civil Code, which protect

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161 *Gordon v Canada (Health)* (2008) FC 258; [2008] FCJ No 331 (QL); 324 FTR 94.
162 Privacy Commissioner (2014), *supra* n 1, 53-54.
163 *Ibid*, at 54.

privacy rights.[164] Generally the wrongdoer has to have acted wilfully (except in Manitoba), and the test of a breach of a person's right to privacy is based on reasonableness.[165] A number of provinces also have freedom of information legislation and personal information protection legislation that provide similar protection to PIPEDA discussed above.[166]

As can be seen, much of the legislation in Canada is concerned with information privacy, and how information is dealt with, which is directly relevant to what is collected by UAS. However, there is little direct regulation or protection – other than incidentally – against the physical intrusion of surveillance equipment, including UAVs and UAS. The common law offers some protection against these interferences through tortious remedies, and through property rights. These are examined below.

Privacy and the common law

In Canada the Courts have been reluctant to expressly sanction a stand-alone tort of invasion of privacy.[167] Early decisions preferred to fit invasions of privacy into existing remedies such as trespass, nuisance and defamation.[168] Recent decisions, however, indicate the development of a legal right to privacy. In *Dyne Holdings Ltd. v Royal*

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164 *Supra,* n 64. The Quebec *Charter* protection was explored in In *Les Éditions Vice-Versa Inc v Aubry* (1998) 157 DLR (4th) 577, where the Court found that a photograph taken in a public place which was later published without the subject's consent intruded into the sphere of individual autonomy which the *Charter* protected (at 594).

165 See *Jones v Tsige* (2012) 346 DLR (4th) 34 at paras [52]-[54].

166 Freedom of Information and Protection of Privacy Act 2003 (BC), Personal Information Protection Act 2003 (NS), Personal Information Protection Act 2003 (AB), Personal Health Information Protection Act 2004 (ON), An Act respecting the protection of personal information in the private sector 1994 (QB), and Personal Health Information Privacy and Access Act 2009 (NB).

167 For a good discussion of privacy in relation to the use of drones in Canada, see Holden, supra n 67.

168 *Dyne Holding Ltd. v Royal Insurance Co. of Canada* (1996) 135 DLR (4th) 142, at 157-158, per Carruthers CJ

Insurance Co. of Canada Chief Justice Carruthers of the Prince Edward Island Supreme Court, stated: "It would seem to me the courts in Canada are not far from recognizing a common law right of privacy if they have not already done so."[169] Similarly in Ontario, in the context of an unauthorised credit check by the defendant on an employee, Justice Stinson recognised the inherent limitations of the traditional torts such as nuisance, trespass and harassment to address privacy concerns in the modern technological age:[170]

> With advancements in technology, personal data of an individual can now be collected, accessed (properly and improperly) and disseminated more easily than ever before. There is a resulting increased concern in our society about the risk of unauthorized access to an individual's personal information. The traditional torts such as nuisance, trespass and harassment may not provide adequate protection against infringement of an individual's privacy interests. Protection of those privacy interests by providing a common law remedy for their violation would be consistent with Charter values and an "incremental revision" and logical extension of the existing jurisprudence.

In *Jones v Tsige*[171] the Ontario Court of Appeal followed the US approach and applied the tort of "intrusion on seclusion" in relation to misuse by one bank employee of another employee's personal information. Sharpe JA adopted the US definition of intrusion upon seclusion as follows:[172]

> One who intentionally intrudes, physically or otherwise, upon the seclusion of another or his private affairs or concerns, is subject to liability to the other for invasion of his privacy, if the invasion would be highly offensive to a reasonable person.

In the course of his judgment, Sharpe JA made the following comments on the need for

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169 *Ibid*, at 160.

170 *Somwar v McDonald's Restaurants of Canada Ltd.* (2006), 79 O.R. (3d) 172, [2006] O.J. No. 64 (S.C.J.), at paras [29] and [30].

171 *Jones v Tsige* (2012) 346 DLR (4th) 34.

172 *Supra*, para [19], referring to US, *Restatement of the Law, Second, Torts*, § 652B.

the law to keep pace with technological change:[173]

> [67] For over one hundred years, technological change has motivated the legal protection of the individual's right to privacy. In modern times, the pace of technological change has accelerated exponentially. …
>
> The internet and digital technology have brought an enormous change in the way we communicate and in our capacity to capture, store and retrieve information. …
>
> [68] It is within the capacity of the common law to evolve to respond to the problem posed by the routine collection and aggregation of highly personal information that is readily accessible in electronic form. Technological change poses a novel threat to a right of privacy that has been protected for hundreds of years by the common law under various guises and that, since 1982 and the *Charter,* has been recognized as a right that is integral to our social and political order.

This leaves Canada in a similar position to the US,[174] and provides a developing common law remedy for invasions of privacy that are committed by private parties or entities not otherwise easily subject to the protections contained the *Charter* or in specific privacy legisation. The decision highlights the potential application of the developing tort of invasion of privacy by the use of UAS, and does raise the need to ensure specific defences for CF and other governent agencies when such use is in the public interest.

Property rights and UAS in Canada

As already discussed the actions in nuisance and trespass have long been available to protect the physical dimensions of a landowners property. The rules that apply are largely settled, and the Canadian courts apply these principles in much the same way as other common law jurisdictions. The discussion of trespass and nuisance in Chapter 2 (above) may be referred to.

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173 *Jones v Tsige* (2012) 346 DLR (4th) 34, at paras [67]-[68].

174 See discussion of the US position in Chapter 4 below.

The use of UAS extraterritorially

The dimensions of, and rules that apply to, the various maritime zones under UNCLOS, including the CZ, EEZ, CS and "high seas" have already been discussed, and are described in more detail in APPENDIX 1 to which the reader is referred.

In addition to UNCLOS, there are various international treaties and agreements that govern the activities of states in areas beyond national jurisdiction. Examples include the Antarctic Treaty of 1959, and the Outer Space Treaty of 1967.[175] Such instruments generally provide for the peaceful use of areas for scientific research, the suspension of territorial claims, and the prohibition of military activity including weapons testing.

CF operations in the economic zone and extraterritorially

The surveillance and protection of the CZ, EEZ and CS is pimarily the responsibility of the military in terms of sovereignty protection and security matters.[176] Surveillance may be shared between the military and other relevant government departments; for example in enforcing customs, fiscal, immigration and sanitary laws in the CZ; fisheries jurisdiction in the case of the EEZ; or regulating oil and gas exploration on the CS.[177] Otherwise CF operations on the high seas are subject to the law of the sea as enshrined in UNCLOS.

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175 For example, the Antarctic Treaty 1959, 12 UST 794; 402 UNTS 71; 19 ILM 860 (1980); the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967, 18 UST 2410, 610 UNTS 205, 6 ILM 386 (1967); Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water 1963, 480 UNTS 43, 14 UST 1313, 2 ILM 889 (1963).

176 DND, *Canada First Defence Strategy* (Ottawa: DND, 2008), at 3, and 7-10; and *CFJP 01*, *supra* n 106, paras [0406] and [0407] (Defence mission and CF roles).

177 Oceans Act, S.C., c. 31, ss 14 (1996) (jurisdiction in EEZ), and 18 (jurisdiction in CS).

Under the National Defence Act 1985, domestic law and military regulations apply to serving personnel and others in or on CF bases or assets, whether operating within Canada or worldwide.[178] It follows that the CF, the Coastguard and other relevant agencies of government may be deployed within the economic zone to enforce Canada's economic interests in the CZ, EEZ and CS, including boarding and apprehension of vessels and aircraft, and to exercise the right of hot pursuit beyond the economic zone if justified.[179]

As stated Canada exercises sovereign rights in the economic zone to manage and control access to fisheries, minerals and other economic resources. A state also has the right under international law to defend itself against attack, and otherwise protect its security.[180] This gives the Government of Canada the right to deploy the CF and its assets, which may include UAS, into that area. The possible legal impacts of UAS in terms of constitutional rights, privacy and other private rights are therefore very limited. Their use may, however, still breach the right of innocent passage of vessels, international human rights, constitutional rights of Canadian citizens and residents, and their privacy and property-based rights. If a UAS intrudes into the territory of a neighboring state, it would become subject to that state's laws.

The legal rights that apply in the domestic territorial zone (discussed above), generally

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178 National Defence Act, R.S.C., c. N-5, (1985), ss 31 (active service), 60(1) (extraterritorial application of Code of Service Discipline), 273 (jurisdiction of civil courts). See also generally Part III, Code of Service Discipline.

179 See discussion on "Territorial sovereignty" above.

180 See discussion above at pp. 27-30.

apply *mutatis mutandis* to Canadian flagged vessels, aircraft and installations, including military assets, in the economic zone and extraterritorially.[181] This may include installations in the Arctic circle. There are also international civil aviation regulations that govern the use of UAS in international airspace. These will now be examined.

International aviation rules

Certain international agreements and rules have application to the use of UAS beyond the domestic territory of states. The Convention on International Civil Aviation (CICA) came into force on 4 April 1947,[182] and there are now 191 member states.[183] The International Civil Aviation Organisation (ICAO), headquartered in Montreal, develops international civil aviation Standards and Recommended Practices (SARPs) to guide states in their regulation of the civil aviation sector. The SARPs cover both the use of international airspace, and some aspects of domestic airspace, used for international civil aviation.[184] The ICAO identifies UAS as "aircraft" for the purposes of the ICAO responsibilities.[185] It is important to note that "state aircraft", which includes military, are not subject to the CICA and its SARPs.[186] Nevertheless the Convention requires parties, when regulating state aircraft, to have "due regard for the safety of navigation of civil aircraft",[187] and

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181 See UNCLOS, Art 91. A flag doesn't bestow "territorial" jurisdiction on a vessel or installation, but simply makes it subject to the legal jurisdiction of the flag state: Daniel P. O'Connell, *International Law*, (London: Stevens, 1965), vol. II, at 661. See also L. Lassa F. L. Oppenheim, *International Law*, (London: Longmans Green & Co, 1905), vol. I, at 318.

182 International Civil Aviation Organization (ICAO), Convention on International Civil Aviation, 9th edn, Doc. 7300/9, (Geneva: ICAO, 2006) ("CICA"), available at: http://www.icao.int/publications/Pages/doc7300.aspx

183 ICAO, "About ICAO", on ICAO website, at http://www.icao.int/about-icao/Pages/default.aspx

184 *Ibid.*

185 ICAO, *Circular 328, AN/190, Unmanned Aircraft Systems* (ICAO: Montreal, QB, 2011), ("ICAO Cir. 328"), at paras 1.7 and 2.5, available at http://www.icao.int/Meetings/UAS/Pages/UAS_Documents.aspx.

186 CICA, Art. 3(a); and, ICAO Cir. 328, ibid, at para 3.7.

187 *Ibid*, Art 3(d).

"pilotless aircraft" must be controlled so as to "obviate danger to civil aircraft".[188] It follows that, notwithstanding the fact that military UAS are not directly subject to CICA, states must ensure that they don't pose a threat to civil aviation when flown in civil airspace. This has led to some jurisdictions regulating the use of military UAS in their airspace,[189] and in Europe UAVs over 150 kg are expected to comply with equivalent civil aviation rules and standards.[190] As UAS are not generally equipped with collision avoidance technology, there are significant obstacles to flying them in European airspace. One-off flights are possible under certain conditions, and efforts to harmonise and integrate UAS into European airspace are ongoing.[191] Both the US FAA and the European Union are leading the way in harmonising the use of UAS, including military, into general aviation rules and applying appropriate aviation standards to them.

CICA confirms that all countries have absolute sovereignty in the airspace above their

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188 *Ibid,* Art. 8. See also ICAO, *Annex 2 to the Convention on International Civil Aviation - Rules of the Air*, (Incorporating Amendment 43) (Brussels: ICAO, 2012), para 3.1.9.

189 See, for example, Aviation Act 2009 (Finland), which applies to military aircraft, but allows exemptions and requires coordination between civil and military aviation (ss 3 and 4). In the US, the FAA currently restricts the use of UAS to defined restricted areas but allows waivers on a case by case basis: see FAA, *Fact Sheet: Unmanned Aircraft Systems (UAS)* (Washington, D.C.: FAA, March 2015) (Certificates of waiver or authorization for Government UAS operations); and see Congressional Research Service, *Report R41798, Federal Aviation Administration (FAA) Reauthorization: An Overview of Legislative Action in the 112th Congress* (coordinated by Bart Elias) (Washington, D.C., CRS, 9 August 2011).

190 See European Defence Agency, *Factsheet: Remotely Piloted Aircraft Systems* (Brussels: EDA, 2015), (use of all RPAS is limited to certain areas of restricted airspace). See also NATO, *STANAG 4671, Standardization Agreement: UAV Systems Airworthiness Requirements (USAR) (Ed. 1)* (Brussels: NATO, FINAS WG, 2009). See also EUROCONTROL, European Organisation for the Safety of Air Navigation, *EUROCONTROL-SPEC-0102, Eurocontrol Specifications for the Use of Military Remotely Piloted Aircraft as Operational Air Traffic Outside Segregated Airspace*, (Brussels: EUROCONTROL, 2012), and EC, European Parliament, *Regulation No 216/2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency*, OJ L 79, 19/03/2008, 1.

191 See, for example, European Union, Single European Sky ATM Research, *European Aviation Master Plan: The Roadmap for Delivering High Performing Aviation for Europe Executive View, Edition 2015* (Luxembourg, EU Publications Office, 2015), esp at 15 (integrationof military and civil aviation), 31 (military performance requirements), and 53-54 (remotely piloted aircraft systems).

countries.[192] Scheduled international air services require authorization of states they overfly or stop at.[193] Military overflight and landings must also be authorized.[194] Article 8 of the Convention (as amended) provides specifically for UAS:[195]

> No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft.

Under the ICAO detailed rules and regulations, including SARPs, have been introduced for civil aviation, including in 2011 a Circular on "Unmanned Aircraft Systems".[196] While the Circular does not establish detailed requirements, it does state that to be safely integrated into non-segregated airspace, UASs must be able to "act and respond as manned aircraft do".[197] They will need to meet the ICAO Standards applicable to manned aircraft, "as well as any special and specific standards that address the operational, legal and safety differences between manned and unmanned aircraft operations".[198] Further, UASs must also comply with rules for flight and equipment promulgated by the state(s) whose flag they carry.[199] The Circular makes it clear that operators must be approved by their own state, and must coordinate their activities with the responsible Air Traffic

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192 CICA, Art. 1.
193 *Ibid*, Art. 6.
194 *Ibid*, (Art. 3 (c).
195 International Civil Aviation Organization (ICAO), *Convention on International Civil Aviation, 9th edn, Doc. 7300/9*, (Geneva: ICAO, 2006), available at: http://www.icao.int/publications/Pages/doc7300.aspx
196 ICAO Cir. 328, *supra* n 185.
197 *Ibid*, para 2.13 and 3.1.
198 *Ibid*, para 3.1.
199 *Ibid*, paras 2.8-2.21. See also Leslie Cary and James Coyne, "ICAO Unmanned Aircraft Systems (UAS), Circular 328", *2011-2012 UAS Yearbook - UAS: The Global Perspective* (Paris: Blyenburgh & Co, 2012), at 112–115.

Services organization for the area of flight.[200]

The Circular also notes that NATO has produced guidelines for military UAS flights in civil airspace through Standardization Agreements (STANAGs) which deal with matters such as airworthiness of fixed-wing UAS with a MTOW of between 150-20 000 kg, and training for operators.[201]

Canadian regulation of military UAS in the economic zone and beyond

It might be expected that Canada, as one of the founding members of the ICAO would implement the ICAO Rules in relation to use by CF of UAS in the EEZ and CS. The current approach of the DND appears to be that military UAS are not governed by civil aviation rules, although the TAA has issued Advisories for the operation of military UASs generally,[202] and the operation of small UAS over international waters.[203]

In the former it is clearly stated that the Advisory is just that: it is not mandatory, nor is it a regulation.[204] It does subject the operations of Tier 1 and Tier 2 UAS to all requirements for airworthiness contained in the TAA's Technical Airworthiness Manual (TAM),[205] which essentially requires compliance with general military aviation standards.

The latter provides a special certification process for smaller Tier 3 UAS, including those

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200 ICAO Cir. 328, para 3.19.
201 ICAO Cir. 328, Appendix, para 9, and fn 2.
202 TAA Advisory 2013-05. Note that the TAA Advisories refer to "UAVs" so that acronym will be used in this section to refer to the actual unmanned aircraft.
203 TAA Advisory 2014-02.
204 TAA Advisory 2013-05, para 1.2.
205 TAA, *Technical Airworthiness Manual C-05-005-001/AG-001,* ("TAM") available at http://www.forces.gc.ca/en/business-regulations-technical-airworthiness/-airworthiness-manual.page,

being operated from Canadian naval vessels in international waters and theatres of operation. A Tier 3 UAS does not have to meet all the requirements of the TAM, but it must be demonstrated that it is "acceptably safe to operate within its defined roles, environment and limitations".[206] A "Restricted Type Certificate" will be issued once this process has been successfully completed.[207]

As part of its contribution to NORAD, Canada may not only deploy UAS in its own economic zone, but also over adjacent US territorial and maritime zones as part of joint operations. The latter will be subject to US aviation regulation except to the extent that exemptions have been agreed between the NORAD partners.

The Arctic region is of high strategic and economic to Canada. It can be anticipated that more mineral and oil and gas exploration will take place as navigability increases due to ice melt. More vessels can be expected to use Arctic routes for direct access between Asia and Europe. The risks of maritime disasters, fisheries resource depletion and environmental pollution will increase. Canada has a large SAR zone of responsibility reaching well into the Arctic Ocean, and into the North Atlantic.

Unlike Antarctica, there is no comprehensive agreement for the Arctic region. Claims to EEZ and CS areas are determined under UNCLOS. The "Arctic Council"[208] has achieved

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206 TAA Advisory 2014-02, paras 4.4.1.1 – 4.4.4.

207 *Ibid*, at para 4.4.1.2.

208 The Declaration on the Establishment of the Arctic Council 1996 ("Ottawa Declaration"), was signed in Ottawa on 19 September 1996, available at "Arctic Council: Founding Documents," Arctic Council Document Archive, at https://oaarchive.arctic-council.org/handle/11374/85. The Arctic Council comprises the Arctic nations of the US, Canada, Iceland, Norway, Sweden, Finland, Russia and

the implementation of a legally binding agreement on SAR cooperation in the Arctic.[209]

Under Canadian law, the DND has primary responsibility for SAR, with practical implementation shared with the Canadian Coast Guard and other federal and provincial agencies.[210] There are agreements between Canada and the US regarding SAR in the Arctic Ocean, and the *International Convention on Maritime Search And Rescue 1979* sets out a regime for co-operation between governments in relation to SAR maritime operations.[211]

It is anticipated that UAS will be increasingly employed by CF for long-distance and long endurance surveillance, both for defending Canada, and for SAR, fisheries and environmental monitoring.

In summary, the extraterritorial use of UAS is not generally governed by international aviation rules, although there is an expectation that states will control such use so as to avoid danger to civil or military aircraft or surface vessels of other states. The main control over military UAS use in this zone is through state regulation. In Canada's case the use of UAS is not subject to domestic civil aviation regulation. They are, however,

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Denmark (including Greenland and the Faroe Islands), representatives of indigenous nations and other interested nations (as observers).

209 Arctic Council, Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, 12 May 2011, 50 I.L.M. 1119 (2011), esp Art. 8. Available at https://oaarchive.arctic-council.org/handle/11374/531.

210 DND, *B–GA–209–001/FP–001 DFO 5449, National Search and Rescue Manual,* (Ottawa: DND, 1998), see at 5-11, paras 1.13-1.30 (SAR responsibilities), and 25-26, ANNEX 3A "Search and Rescue Region Boundaries."

211 See the The *IMO Search and Rescue Manual (IMOSAR Manual)* 3rd ed, (IMO: London: 1993). *See also International Aeronautical and Maritime Search and Rescue Manual* (*IAMSAR manual)* (London: IMO, 2007).

governed by adherence to the general rules of international law, the exercise of legitimate roles and functions of the DND and CF, and the specific TAA airworthiness and operational rules.

In summary, the regulation of military UAS in the economic zone and extraterritorially suffers from the same inadequacies as already mentioned in relation to the domestic zone. In Canada's case, the use of military UAS is not subject to domestic civil aviation regulation, although they are governed by the general rules of international law. The control of airworthiness and safety of military UAS is under the control of the TAA which is essentially a military-centric agency, and arguably there is a lack of independent auditing and verification of airworthiness matters. Furthermore, the TAA guidance is restricted to technical matters and does not impose requirements for training and competency of UAS operators. This lack of coordination and transparency carries a risk of conflict between UAS and other aircraft in international civil airspace, and should be addressed by specific regulation clarifying the applicability of international and domestic civil aviation riles to military UAS.

The use of unarmed UAS in expeditionary operations

The rules that apply in this zone are complex due to the wide variety of possible operational situations. The CF may be operating alone in a foreign state due to a bilateral arrangement for training, combat or peace support operations. It may be operating as part

of a combined coalition force,[212] as part of a NATO operation, or a UN-led peace making or peacekeeping operation (PKO). It may be operating in a foreign country by invitation of a functioning government, or it may be operating without host-nation consent in a "failed state" or in a conflict scenario.[213] Expeditionary forces normally operate under reasonably clear mandates and legal structures, unless it is an urgent operation.

Article 3(c) of CICA provides a starting point:

> No state aircraft of a contracting State shall fly over the territory of another State or land thereon without authorization by special agreement or otherwise, and in accordance with the terms thereof.

This reflects the principle of sovereignty upheld by the general rules of international law.

UN Operations

UN expeditionary operations are normally authorised by a Security Council resolution, which contains detailed provisions covering the nature of the intervention, and the rights and duties of participating UN personnel. The UN *Peacekeeping Operations Principles and Guidelines* provide guidance to contributing nations to operate impartially within the terms of the relevant UNSCR, to respect local laws where possible, and to avoid the use of force except in self-defence or defence of the mandate.[214] Article VI of the 1946

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212 For example, "Operation Enduring Freedom" in Afghanistan from 2001, and the "Coalition of the Willing" in Iraq in 2002.

213 For example, operations in Somalia 1992-93.

214 UN, Peacekeeping Best Practices Section, Division of Policy, Evaluation and Training, Department of Peacekeeping Operations, *Peacekeeping Operations Principles and Guidelines* (NY: United Nations Secretariat, 2008), at Chapter 3, at 31-40, http://www.un.org/en/peacekeeping/documents/capstone_eng.pdf.

Convention on the Privileges and Immunities of the United Nations[215] provides certain immunities from arrest and local legal process for "experts on mission" in the performance of their duties. There is also a UN model SOFA for peace-keeping operations.[216] Depending on the specific negotiations with the host state, the SOFA may provide immunity from arrest and detention of UN peacekeepers, exclusive jurisdiction for criminal matters to the sending state, full freedom of movement of personnel, vehicles, vessels and aircraft, and unrestricted telecommunications.

The use of UAS for surveillance will generally be treated the same way as the use of aircraft. Unarmed UAS have been used since 2013 by national contingents in support of UN missions,[217] including in the Democratic Republic of Congo, and in Mali. So far they have been used primarily for surveillance and to provide a deterrent to criminal activities and terrorism.[218]

The use of UAS may also be covered in particular SOFAs for surveillance and deterrence. UN SOFAs generally require contributing nations to comply with relevant host nation laws, and this may well include laws on human rights and freedoms, privacy and property

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215 UN, Convention on the Privileges and Immunities of the United Nations 1946, 1 UNTS 15/ [1949] ATS 3 (13 February1946) ("1946 Convention").

216 UN, "Model Status-of-Forces Agreement for Peace-Keeping Operations", Gen. Assembly Doc. A/45/594 (NY: UN, 1990).

217 UN, Report of the Special Committee on Peacekeeping Operations, GAOR, 66th Sess., Supp. No. 19, A/66/19 (NY: UN, 2012), para 39 (sanctioning the use of UAS by UN forces), available at http://www.un.org/en/ga/search/ view_doc.asp?symbol=A/66/19.

218 Kasaija Phillip Apuuli, "The Use of Unmanned Aerial Vehicles (Drones) in United Nations Peacekeeping: The Case of the Democratic Republic of Congo", *American Society of International Law Insights* 18(3), 13 June 2014, https://www.asil.org/print/1105; Hervé Ladsous, "Drones are effective in protecting civilians" *Africa Renewal online,* April 2016, at 34, http://www.un.org/africarenewal/magazine/april-2016/drones-are-effective-protecting-civilians; Sophie Pilgrim, "Are UN drones the future of peacekeeping?" *France 24,* 9 April 2014, http://www.france24.com/en/20150409-un-drones-future-peacekeeping-democratic-republic-congo-fdlr-humanitarian-drc

rights. Where the UAS operations are undertaken in direct pursuance of the mandate, they shoud be immune to any breaches of local law. Nevertheless, contributing nations should become familiar with relevant local laws and restrictions on the use of UAS to avoid breaches of local laws, even if UAS deployment is permitted under the SCR or a SOFAs.

The UN seeks written approval from the host state for flying in it airspace, and this includes deployment of UAS. A host state may require imagery to be made available to them as a condition of approval.

NATO Operations

In NATO operations, the participating forces will generally be subject to the *Agreement Between the Parties to the North Atlantic Treaty* signed in 1951 (NATO SOFA), or the *Partnership for Peace Status of Forces Agreement* signed in 1995 (PfP SOFA) which extends beyond NATO members to include NATO partners who have signed up to it. Canada is a member of NATO and so bound by the NATO SOFA, and any other NATO rules and guidelines for operational deployment of aircraft, including UAS.

NATO members and partners must respect the laws of the receiving state, but will normally exercise criminal jurisdiction over their own military and civilian members for official acts in the line of duty. Other matters covered include civil jurisdiction, waiver of immigration formalities, wearing of uniforms, carrying of arms, property damage, taxation, access to facilities and provision of infrastructure.[219] . Apart from the freedom of

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[219] See NATO, *Agreement Between the Parties to the North Atlantic Treaty regarding the Status of their Forces*, 19 Jun. 1951, http://www.nato.int/cps/en/natohq/official_texts_17265.htm and NATO,

movement and freedom to operate vehicles, vessels and aircraft in the receiving state, there is no specific regulation on the use of UAS for surveillance. Arguably, however, the freedoms of movement for aircraft, will authorise the use of UAS. As with UN missions, occupying states and its forces are generally immune from any alleged breach of property rights, privacy or personal liberties that arise from the use of UAS provided such actions were in required in pursuit of the mission.

The NATO UAV Flight in Non-Segregated Airspace Working Group (FINAS WG) has developed guidelines for NATO forces on the cross-border operation of UAS in civil and international airspace. Guidelines have also been produced for airworthiness of large (150-20,000 kg) UAS, and for UAV pilots.[220]

In addition to the NATO rules and guidelines, CF will often have its own CONOPS and ROEs that apply to the use of UAS. One example is the CONOPS for the use of the CU170 Heron by CF in Afghanistan.[221] This covered the use of the unarmed Heron MALE platform for surveillance and reconnaissance operations right through to target acquisition and engagement. Importantly the CONOPS included sections on "Flight Safety", "Theatre Airspace Coordination and Integration", "UAV Mission Process", "Communications", "Training" and "Flight Authority". The CONOPS required the "Air Vehicle Operator" (AVO) to be a qualified CF pilot, or ACSO, and have completed

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Agreement among the States Parties to the North Atlantic Treaty and the other States participating in the Partnership for Peace regarding the Status of their Forces, 19 June 1995, http://www.nato.int/cps/en/SID-63BC3308-D3265625/natolive/official_texts_24742.htm?selectedLocale=en

220 See ICAO Cir. 328, Appendix, para 9, and fn 2.

221 DND, *Project Noctua CU170 Heron Unmanned Aerial Vehicle (UAV) Concept of Operations (CONOPS)*, issued by Commander Canadian Expeditionary Forces Command, 25 May 2009, version 1.1.

contractor training on the operation of the CU 170 Heron.[222] While the Combined Forces Air Component Commander was the Airspace Control Authority for Afghanistan, the UAV detachment was still required to comply with Afghanistan air traffic control procedures.[223] Current operational and technical airworthiness certifications were required from the TAA in the form of "Specific Purpose Flight Permit(s)" and "Record(s) of Airworthiness Risk Management".[224] Compliance with a number of Canadian CF rules and regulations was also required.[225] The CU170 Heron CONOPS provides a very useful model for the management of UAS flights on expeditionary operations, and in particular, the integration and deconfliction with other military and civil aircraft in the civil airspace of the host nation.

Other expeditionary operations.

The general rules of international law and local laws governing the use of unarmed UAS will apply unless varied by agreement, or the operation is against a belligerent state, in which case the laws of war will apply. In PKOs and humanitarian missions there will usually be a bilateral or multilateral SOFAs between the host nation and the international state(s). SOFAs contain a number of common elements, including giving international forces the privileges, exemptions and immunities of administrative and technical staff of a diplomatic mission.[226] Similar powers and immunities as under the NATO SOFA (above)

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222 *Ibid*, paras 2.4.6, p 11-12.
223 *Ibid*, paras 4.1-4.2, p 22-23.
224 *Ibid*, paras 11.2-11.4.
225 *Ibid*, at vii, and para 11.4. This including *B-GA-100-001/AA-00 National Defence Flying Orders*, *A-GA-135-001/AA-001 Flight Safety for the Canadian Forces, I Cdn Air Div Orders,* and the TAA's *Technical Airworthiness Manual*.
226 US Department of State International Security Advisory Board, *Report on Status of Forces Agreements*, 16 January 2015, Appendix A "Text of Global SOFA Template", available at http://www.state.gov/documents/organization/236456.pdf, See also R. Chuck Mason, *Status of Forces*

will normally apply.[227] SOFAs also provide for freedom of entry, exit and movement of vehicles, vessels and aircraft of the occupying forces. Unless there are specific provisions for the use of UAS, it is likely the general freedoms of movement of aircraft will apply provided the use is in furtherance of the mission. Unless specifically waived or modified by agreement with the host nation, international human rights law, and domestic ratifications and others laws relating to human rights, liberty, and privacy will generally bind military and civilian personnel while on expeditionary operations, although this is an uncertain legal area.

Summary

The regulation of military UAS on expeditionary operations appears to be well covered by the terms of UN or NATO operations, and specific provisions in SOFAs and occupation agreements in other expeditionary operations. Specific provisions for UAS use are rare, but they would be covered under the freedoms given for use of aircraft in furtherance of the objectives of the mission. While there are some immunities, it will normally be the case that occupying forces must comply with local laws regarding human rights, privacy and property rights. Arguably the use of UAS on specific missions by CF has been well regulated through the design of thorough CONOPS to ensure safety and

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Agreement (SOFA): What Is It, And How Might One Be Utilised In Iraq, Congressional Research Service Report for Congress RL34531 (Washington: CRS, 2008), for a description of common components of SOFAs and recent examples of bilateral and NATO SOFAs.

227 See, for example, Australia, Department of Foreign Affairs and Trade, Agreement Between Solomon Islands, Australia, New Zealand, Fiji, Papua New Guinea, Samoa and Tonga Concerning the Operations and Status of the Police and Armed Forces and Other Personnel Deployed to Solomon Islands to Assist in the Restoration of Law and Order and Security, 24 July 2003, Australian Treaty Series [2003] ATS 17; Australia, Arrangement Between the Government of Australia and the Government of the Democratic Republic of Timor-Leste Concerning the Restoration and Maintenance of Security in Timor-Leste, 26 May 2006, Diplomatic Note No. 159/2006, (also includes accessions by New Zealand and Portugal), available at http://www.laohamutuk.org/reports/UN/06SOFAs.html#Australia.

clear guidance for the use. Nevertheless there appears to be little consideration in such instruments to address matters such as shutter control and height/route restrictions to reduce the possibility of breaches of individual rights such as privacy and property. It is incumbent on CF commanders to become thoroughly acquainted with international and local laws that may apply to the use of UAS.

CHAPTER 4:

COMPARATIVE ANALYSIS OF THE USE OF UAS IN OTHER COUNTRIES

In this chapter the laws and rules relating to the use of UAS by the military in comparable jurisdictions will be examined. This will include the applicability of civil aviation regulation, along with the constitutional, legislative and common law limitations on the use of UAS in a way that interferes with human rights, individual freedoms, privacy and property rights. The jurisdictions examined are the US, the UK and New Zealand as these are Canada's closest allies, and are members of the "Five Eyes" intelligence-sharing community. They also uphold similar democratic principles, and have very similar legal systems based on the common law. Australia has not been included due to constraints of space and the lack of major differences to Canada and New Zealand.

Aviation regulation

The United States

The Federal Aviation Administration (FAA) is the regulatory authority for aviation management in the United States. Military operations of aircraft, including UAS, are classified as "public aircraft operations" (PAO) under Title 49 of the United States Code,[228] and must generally comply with the regulations that apply to all aircraft in the National Airspace System (NAS).[229] In November 2015, the FAA issued a specific

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228 Title 49 U.S.C. §§ 40102(a)(41) and 40125(c).

229 US, Department of Transportation, FAA, *AC No: 00-1.1A: Advisory Circular Public Aircraft Operations* (Washington, D.C.: FAA, 2014), at para 7. d. and e.

Notice on *Unmanned Aircraft Operations in the National Airspace System*.[230] This notice covers all UAS operated in the NAS whether public or civil,[231] and imposes strict requirements on civil and recreational UAS operators to avoid conflicts with civil aircraft, maintain certain distances from airports and remain within certain altitude limits. For operators of public UAS the Notice provides for Certificates of Waiver or Authorisation (COA) to be issued on satisfaction of a number of matters, including airworthiness, flight crew qualifications, communications and surveillance capabilities, proposed flight plan, and contingency procedures.[232] A further requirement is that the UAS must be equipped with "see-and-avoid" technology to ensure similar levels of safety as with manned aircraft. Legal liability for any incidents or accidents is laid squarely at the feet of the operator. Military uses are generally issued with COAs without significant bureaucratic obstacles, and "Military Operations Interface Offices" have been established for the US Navy, Marine Corps, Air Force and Navy.[233]

Pending proposed regulation for small commercial UAS,[234] the FAA civil aviation rules regulate the use of UAS for civil/commercial operations, with some exemptions available for low-risk controlled environments.[235] If such an exemption cannot be obtained, a "Special Airworthiness Certificate" for the system must be obtained from the FAA.[236] For small UAS, less than 55 lb (approx 25 kg), special permission is not required provided the

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230 US, Department of Transportation, FAA, *N JO 7210.891: Unmanned Aircraft Operations in the National Airspace System (NAS)*, (Washington, D.C.: FAA, 2015).
231 *Ibid*, paras 7, and 8. a.
232 *Ibid*, para 10.
233 *Ibid*, at para 11.
234 US, Department of Transportation, FAA, "Small UAS Notice of Proposed Rulemaking (NPRM)", FAA website at https://www.faa.gov/uas/nprm/
235 FAA Modernization and Reform Act 2012 (Public Law 112-95), s 333.
236 US, Department of Transportation, FAA, "Civil Operations – Non-governmental", FAA website at https://www.faa.gov/uas/civil_operations/

operator complies with certain requirements, including visual line-of-sight operation, below 400 ft, clear of manned aircraft, no less than 5 miles from an airport unless with permission, and not near people or stadiums.[237] The US government at the end of 2015 put in place regulation requiring the owners of drones between half a pound and 55 lb half a pound and 55lb (228g - 22.7kg) to register them with the FAA before their first flight.[238] Failure to register could result in fines of up to $27,500. Serious breaches of UAS regulation can attract fines of up to $250,000 or up to three years in jail.[239]

Offshore use of UAS is subject to the rules of international law and operational procedures. While the US has not ratified UNCLOS, it generally complies with the international recognition of territorial seas, contiguous zones, EEZ and CS areas. The US also undertakes expeditionary operations under the banner of the UN and NATO, and the discussion in chapter 3 (above) on operational rules and principles in those missions generally apply to the US. The US also operates independently, or as part of allied coalitions. In such cases there may be SOFAs or other bilateral or multilateral agreements, governing the use of aircraft, including UAS. Finally, the US also has a strong interest in the Arctic region, both for national security, and for resource and environmental, concerns. The US Coastguard takes a major role in policing and SAR

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237 The statutory parameters for flying model aircraft are outlined in the FAA Modernization and Reform Act of 2012 (Public Law 112-95), s 336. See also United States Department of Transportation, FAA, "Model Aircraft Operations", FAA website at https://www.faa.gov/uas/model_aircraft/

238 See US, Department of Transportation, FAA, "Unmanned Aircraft Systems (UAS) Registration", FAA website at https://www.faa.gov/uas/registration/.

239 US, Department of Transportation, FAA, "The FAA Reminds You to Register Your Drone", FAA News & Updates (16 February 2016), FAA website, at https://www.faa.gov/news/updates/?newsId=84807

operations in this region.[240] Such operations will increasingly involve the use of UAS, and this may involve overflight of Canadian territory, which falls under NORAD and US-Canada defence cooperation.

In summary, the US subjects all UAS, inluding military, to regulation when flying in civil airspace, although waivers of requirements are available for military uses usually in defined areas of airspace. Civil use is subject to FAA regulations with some exemptions possible in closely defined situations. Small recreational UAS do not require permissions as long as they comply with strict conditions of use.

The United Kingdom

In the UK there are now separate regulatory regimes for military and civil aviation. The use of military aircraft is regulated by the Ministry of Defence through the Military Aviation Authority (MAA),[241] and civil aircraft by the Civil Aviation Authority (CAA).[242] Notwithstanding this separation of responsibility, the MAA is expected to regulate the airworthiness and operational safety of military aircraft to a standard at least as high as the standards applicable to civil aviation.[243] This can be seen from the plethora of regulation promulgated by the MAA in respect of military aircraft operation in the UK

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240 For a very useful review of the geo-political, legal, security and SAR challenges issues that arise in the Arctic Ocean, see: U.S. Coast Guard, *Arctic Strategy 5* (Washington, D.C.: U.S.C.G., 2013), esp 11-22.

241 UK, MOD, Military Aviation Authority, *MAA01: Military Aviation Authority Regulatory Policy (Issue 4)*, (London: MAA, 2015) (MAA01), at 5, para 5.

242 Civil Aviation Act 2012 (UK), and see Air Navigation Order 2009 (UK) made thereunder, at s 252(1) (non-application of majority of provisions to military aircraft).

243 MAA01, 5 at paras 1-5.

and beyond.[244] A comprehensive suite of regulations on the use of military UAS (or RPAs) were introduced in 2015.[245] The military must ensure civil aviation authorities are advised and deconfliction assured when military aircraft are in civil airspace.[246] UAS must be operated "with due consideration for the safety of persons, aircraft, vessels and infrastructure", and as they don't currently have approved sense and avoid compliance mechanisms, must be restricted to segregated airspace, unless approved on a case by case basis.[247] There are also strict operator training and qualification requirements.[248]

The use of commercial and recreational UAS is subject to CAA regulation. In the case of commercial operations UAS must "meet at least the same safety and operational standards as manned aircraft" of an equivalent type. [249]

Small UAS of 20 kg or less, whether for commercial use or recreational use, are regulated by a set of conditions in Arts. 166 and 167 of the CAA *Air Navigation Order 2009*. These provide a maximum height limitation of 400 ft (unless permission to exceed this has been given by air traffic control), direct visual contact is maintained, and the flight is undertaken safely in respect of people, other aircraft, vessels, vehicles and structures.

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244 See UK, MOD, "Collection, MAA regulatory publications: overarching documents", https://www.gov.uk/government/collections/maa-regulatory-publications-overarching-documents.

245 UK, MOD, "New regulations for Remotely Piloted Air Systems (RPAS) go live", 19 January 2015, at https://www.gov.uk/government/news/new-regulations-for-remotely-piloted-air-systems-rpas-go-live.

246 For information on this, see UK, CAA and MOD, "ATSOCAS: Air Traffic Services Outside Controlled Airspace", http://airspacesafety.com/atsocas/.

247 UK, MOD, MAA, *RA2320 – Role Specific Remotely Piloted Air Systems*, (London: MAA, 2014), para 2 ("RPAS Collision Avoidance - Inside UK Airspace"), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350162/RA2320.pdf

248 See UK, MOD, MAA, *RA1600 - Remotely Piloted Air Systems*, (London: MAA, 2015), available at https://www.gov.uk/government/publications/regulatory-article-ra-1600-remotely-piloted-air-systems-rpas

249 UK, CAA, *CAP 722: Unmanned Aircraft System Operations in UK Airspace – Guidance, 6th Ed,* (London: CAA, 2015), at 22, para 1.1.

Small UAS used for surveillance must maintain a separation of 150 metres from congested areas, groups or assemblies of people, and 50 metres from persons and vehicles, vessels and structures. Larger UAS are generally treated in the same way as civil aircraft and must comply with all CAA requirements, although some exemptions may be approved.[250]

The CAA has taken enforcement action against persons who have breached these rules.[251] In one particularly well-publicized case a man was fined £800 ($C1,500 approx.) and had costs of £3,500 ($C6,500 approx.) awarded against him when he lost control of his drone in the vicinity of a nuclear submarine facility in Cumbria.[252]

In summary, the use of military UAS in the UK is strictly regulated by the MAA which applies rules equivalent to the use of civil UAS. Military UAS, other than nano and micro sizes, must not fly in UK airspace unless in restricted areas, or specific approval has been given by the CAA. Commercial UAS are generally regulated under the civil aviation regulations as "aircraft". Smaller surveillance UAS are subject to strict regulations as to height and proximity to people, structures, other aircraft, vessels and vehicles.

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250 *Ibid*, at paras 2.16-2.20, and 3.4-3.7.

251 CAA, "Drone users must observe rules of the sky, or face prosecution", 22 July 2015, http://www.caa.co.uk/News/Drone-users-must-observe-rules-of-the-sky,-or-face-prosecution/

252 CAA, "First conviction for illegal use of an unmanned aircraft ", 2 April 2014, http://www.caa.co.uk/News/First-conviction-for-illegal-use-of-an-unmanned-aircraft/. See also CAA, "Guilty pleas for dangerous unmanned aircraft theme park flight", 29 May 2014, http://www.caa.co.uk/News/Guilty-pleas-for-dangerous-unmanned-aircraft-theme-park-flight/

New Zealand

The Civil Aviation Authority of New Zealand (CAANZ) is the government entity charged with regulating civil aviation in New Zealand.[253] The Civil Aviation Act 1990, and rules made thereunder, do not generally apply to the New Zealand Defence Force.[254] Nevertheless, certain Civil Aviation rules including the use of aerodromes, flight through controlled airspace, use of lights, communications and transponders, and filing of flight plans, do apply within the territorial limits of New Zealand.[255] As with other jurisdictions, the general requirements under ICAO's CICA (to which New Zealand is a signatory) apply requiring operations of state aircraft to "have due regard for the safety of navigation of civil aircraft",[256] and requiring control of UAS to "obviate danger to civil aircraft".[257]

With regard to civil use of UAS, New Zealand has taken quite a different approach to other countries. There is no regulatory distinction between commercial and non-commercial UAS. Rather the distinction is based on size. UAS of 25kg or less that comply with a number of operational requirements may be flown without specific authorization under CAA "Part 101 Rules",[258] whether for recreational or commercial purposes. The operator must ensure the UAS is flown in daylight hours, in visual line of sight below 400 ft, doesn't pose a hazard to aircraft or to persons or property (including

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253 See CAANZ website at https://www.caa.govt.nz

254 Civil Aviation Act 1990 (NZ), s 3(2)

255 CAANZ, *Civil Aviation Rules Consolidation 2016*, Part 91.1(b)

256 CICA, Art 3(d).

257 *Ibid*, Art. 8. See also ICAO, *Annex 2 to the Convention on International Civil Aviation - Rules of the Air*, (Incorporating Amendment 43) (Brussels: ICAO, 2012), para 3.1.9.

258 CAANZ, *Advisory Circular AC 101-1 (Rev 1): Remotely Piloted Aircraft Systems (RPAS) Under 25 kilograms – Operating in compliance with Part 101 Rules* (Wellington: CAANZ, 2015).

by dropping any object), is not flown within 4 km of any aerodrome, or in controlled airspace, without authorization. Such authorization would normally be forthcoming for legitimate military or police operations. A further requirement is to obtain consent from persons' affected if the UAS is likely to be flown over persons or property, although this requirement appears impractical. If the UAS is between 15 and 25 kg, it must be approved and operated under the authority of an approved person or association such as a model aircraft association. If not, it will be subject to the same rules as UAS of over 25 kg. UAS of over 25 kg are subject to all the requirements of the Part 101 Rules, plus additional requirements under "Part 102 Rules". The latter includes a formal application to CAANZ for an Unmanned Aircraft Operators Certificate.[259] The applicant must satisfy CAANZ that he/she is a "fit and proper person" to hold the Certificate.[260] This is a broad criteria leaving significant discretion to the agency (and the courts if a decision is litigated) to determine its meaning.

Breaches of these rules can result in fines of up to $5000 for individuals, and $30,000 for corporations.[261] Breaches that involve significant threats to persons or property may result in imprisonment.[262] In April 2016, a person was convicted or flying his 2kg drone near a forest fire operation allegedly endangering emergency services. At the time of writing sentencing had not occurred.[263]

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259 CAANZ, *Advisory Circular AC 102-1: Unmanned Aircraft – Operator Certification* (Wellington: CAANZ, 2015).

260 Civil Aviation Act 1990 (NZ), s 10(1).

261 Civil Aviation (Offences) Regulations 2006 (NZ), Regs. 4 and 5, and Schedule 1 (Offences and Penalties).

262 Under the general Criminal Code: Crimes Act 1961 (NZ), Parts 5 – 8 and 10.

263 David Clarkson, "Drone pilot convicted in Civil Aviation Authority test case", *Stuff.co.nz,* 6 May 2016, http://www.stuff.co.nz/national/79694384/drone-pilot-convicted-in-civil-aviation-authority-test-case

In summary, the use of UAS by the military in New Zealand airspace is lightly regulated with considerable uncertainty as to the extent of compliance with civil aviation regulation that is required. Despite significant research and development of UAS platforms for ISTAR purposes,[264] the NZDF is not yet using UAS to any significant degree, and the problem of deconfliction of larger military UAS with civil aviation operations has not yet been considered in depth. Flights by military aircraft in controlled airspace are subject to some Civil Aviation Rules, and generally the NZDF and CAANZ cooperate closely in situations that may involve potential conflicts. However, clearer obligations should be spelled out in regulation for military UAS in civil airspace.

The use of small recreational and commercial UAS are lightly regulated with no certification required if the UAS are below 25 kg and comply with certain conditions of use. This poses a risk that small UAS can be easily acquired and used by criminals or for terrorism. Larger UAS are more closely regulated and operators are required to have formal Certification following an exhaustive process of application including a "fit and proper person" test. Unlike other jurisdictions, New Zealand has specific rules requiring permission of people and property owners if overflight is contemplated.

Privacy law

Constitutional protections

In the United States a number of Supreme Court decisions have found a right of privacy

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264 NZDF Media Release, "Global Interest In Defence Force Innovations", 6 November 2013, at http://www.nzdf.mil.nz/news/media-releases/2013/20131106giidfi.htm

in the Amendments ("Bill of Rights") to the US Constitution.[265] A number of States have specific privacy protection elements in their constitutions.[266]

In 1989 in *Florida v Riley*[267] the US Supreme Court held that an overflight by a police helicopter above a private residence in order to obtain evidence of marijuana cultivation was not a breach of the Fourth Amendment. The helicopter was flown above 400ft which was within navigable airspace, and so any person or entity could overfly the property and observe what the police observed and there was no breach of Fourth Amendment rights. The 1986 cases of *Dow Chemical Co v United States*[268] and *California v Ciraolo*[269] were similarly decided; the former holding there was no breach taking aerial photographs of an industrial complex from navigable airspace, and the latter finding no breach when photographs seeking evidence of marijuana cultivation were taken in commercial airspace at a height of 1000 feet. In *United States v Knotts*[270] the tracking of a person's movements in public places by police using a rudimentary electronic tracking device was also held not to be a Fourth Amendment breach.

More recent cases, however, show the courts are attempting to reign in the use of more

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265 Including the privacy of belief (First Amendment), privacy of the home (Third Amendment), protection against unreasonable searches (Fourth Amendment), the privilege against self-incrimination (Fifth Amendment), and the catch-all protection of "other rights retained by the people" (Ninth Amendment). For a brief discussion of many of these cases, see Thompson, *supra* n 25, at 11-14.

266 See, for example, the California Constitution 1879, Art 1 §1 (privacy an inalienable rights); the Florida Constitution, 1968, Art. 1 §23 (the right to be let alone and free from governmental intrusion into a person's private life); and the Montana Constitution, 1972, Art. 2 §10 (individual privacy essential to well-being of a free society … shall not be infringed without … a compelling state interest).

267 *Florida v Riley* (1989) 488 U.S. 445.

268 *Chemical Co v United States* (1986) 476 U.S. 227.

269 *California v Ciraolo* (1986) 476 U.S. 207.

270 *United States v Knotts* (1983) 460 U.S. 276.

sophisticated technology. In *Kyllo v United States*[271] the Supreme Court held, by a 5–4 majority, that the use of sophisticated thermal imaging equipment to measure heat emissions from a home, in order to acquire evidence for a search warrant for marijuana cultivation, was an unreasonable search and therefore unconstitutional. In the 2012 decision of *United States v Jones*[272] five judges considered that using a GPS device to monitor the movement of a vehicle over a period of a month in connection with a drug trafficking investigation was a "search" of the subject in breach of his Fourth Amendment rights. In 2013 in *United States v Katzin*[273] the US Court of Appeals for the Third Circuit considered that warrantless use of GPS devices by agencies such as the FBI constituted a breach of Fourth Amendment protections, although the decision was later reversed applying the "good faith exception".[274]

Neither the UK or New Zealand have written constitutions so such challenges are not possible in those jurisdictions.

Legislative protections

The US has already been discussed in terms of the potential application of the Bill of Rights to an individuals privacy. Additional legislative measures include the Electronic Communications Privacy Act of 1986 which imposes restrictions on wire taps of

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271 *Kyllo v United States* (2001) 533 U.S. 27.

272 *United States v Jones* (2012) 132 S. Ct. 945.

273 *United States v Katzin* (2013) 732 F.3d 187 (3d Cir.).

274 *United States v Katzin* (2014) 769 F.3d 163 (3d Cir.). The "good faith exception" to the exclusion of evidence obtained unconstitutionally was recognised in *Davis v. United States* (2011) 131 S. Ct. 2419, 2426 in cases where "law enforcement acted with an objectively reasonable good-faith belief that their conduct was lawful": see discussion in Clare Hanlin, "Limited Faith in the Good Faith Exception: The Third Circuit Requires a Warrant for GPS Searches and Narrows the Scope of the Davis Exception to the Exclusionary Rule in *United States v. Katzin*" *Boston College Law Review* 56, no. 6 (2015): 33 at 38.

telephone calls and transmissions of electronic data. The Stored Communications Act 1986 clarifies privacy protection for email and digital communications on the internet. It includes limits on the ability of government to require information from internet service providers, and also limits commercial ISPs from divulging such information to private entities. There are a number of other federal measures covering privacy of health, financial, and driver information.[275] There are also many state measures dealing with privacy in various contexts.

The UK has no general "Privacy Act" as such, but enacted the Data Protection Act in 1998. That measure sets out "data protection principles",[276] and provides strong protection for sensitive information, including material that may relate to ethnicity, political views, religious beliefs, health and criminal records. It also provides stiff penalties for unlawful obtaining and use of personal data.[277] The Information Commissioner established under the Act is responsible for privacy complaints, education on privacy matters, and upholding the privacy principles.

New Zealand enacted the Privacy Act in 1993. This measure also sets out an extensive set of "information privacy principles" that guide the collection, use, disclosure and security of, and access to, personal information.[278] The Act also sets up a Privacy Commissioner whose many functions include monitoring and reporting to government on privacy issues,

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275 For example, the Health Insurance Portability and Accountability Act 1996 (US) (see, eg, Rule 2.1), Financial Services Modernization Act 1999 (US (15 U.S. Code Subchapter I - DISCLOSURE OF NONPUBLIC PERSONAL INFORMATION), Fair Credit Reporting Act 1971 (US), Fair Debt Collection Practices Act 1977 (US), and Driver's Privacy Protection Act 1994 (US).

276 Data Protection Act 1998 (UK), s 4, and Part I, Schedule 1.

277 *Ibid*, Parts V & VI.

278 Privacy Act 1993 (NZ), s 6.

conduction investigations, educating the public, and providing information on personal information held by any agency.[279]

The Search and Surveillance Act 2012 was enacted to facilitate more effective use of search and surveillance in relation to suspected crime (including terrorism). The Act followed a report of the Law Commission, which considered that the law of search and surveillance had not kept pace with sophisticated criminal activity, which often used advanced technology.[280] The Commission considered that human rights law allows some search and surveillance in order to allow a state to function and to protect rights of citizens.[281] The measure as enacted allows immediate search and seizure without obtaining a warrant from a court in some cases where it is believed any delay will allow the destruction of evidence. The measure faced considerable opposition from civil liberties groups, but the Attorney-General is on record stating it did not violate human rights.[282]

Common law privacy protections

It was suggested as early as 1890 in the US, by Samuel Warren and Louis Brandies, that an enforceable right to privacy existed based on the US Constitution and the common

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279 Privacy Act 1993 (NZ), ss 12 & 13.

280 New Zealand Law Commission, *Search and Surveillance Powers* Report No. 97, (Wellington: NZLC, 2001), 14.

281 *Ibid*, at para 2.24.

282 New Zealand, Ministry of Justice, Attorney-General, "Search and Surveillance Bill (45-1): Consistency with the New Zealand Bill of Rights Act 1990" (Wellington: Crown Law Office, 2009), at http://www.justice.govt.nz/policy/constitutional-law-and-human-rights/human-rights/bill-of-rights/search-and-surveillance-bill-1. It has also received favourable academic commentary, including that it clarifies rights in this area: Simon Collier, "Search and Surveillance Act" *Auckland University Law Review* 18 (2012): 295.

law.[283] Brandeis later became a Judge of the US Supreme Court, and maintained this view in his judgments, although the concept was not widely accepted at that time.[284] By 1960 the courts of many of the states had accepted the existence of a right of privacy "in one form or another".[285] Prosser suggested that individuals have an underlying "right to be left alone" and this right could be enforced through several different torts, comprising:[286]

1. Intrusion upon the plaintiff's seclusion or solitude, or into his private affairs.
2. Public disclosure of embarrassing private facts about the plaintiff.
3. Publicity which places the plaintiff in a false light in the public eye.
4. Appropriation, for the defendant's advantage, of the plaintiff's name or likeness.

The first two of these four categories have direct relevance to the use of UAVs and UAS; the latter two less direct, but applicable depending upon the nature of the surveillance and use of data collected.

Intrusion upon seclusion has been held to require an intentional invasion, and be of such a degree of persistence or extent that a reasonable person would find the intrusion highly offensive.[287] This would certainly be the case with persistent and intrusive use of UAVs for surveillance.

Public disclosure of private facts may be a result of the physical visibility of the deployment of UAS, or it may result from the use put to the information or data that is

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283 Samuel Warren and Louis Brandeis, "The Right to Privacy" *Harvard L.R.* 4 (1890): 193.
284 See also Justice Brandeis' dissent in *Olmstead v. U. S.* (1928) 277 US 438 esp at 478-479.
285 Prosser, *supra* n 65, at 386-388. The exceptions were Rhode Island, Nebraska, Texas, and Wisconsin.
286 *Ibid*, at 389 with detailed discussion from 389-407.
287 See, for example, *Miller v National Broadcasting Co.* (1986) 187 Cal. App. 3d 1463 (Cal. Ct. App.); *Nader v General Motors Corp.* (1970) 25 N.Y. 2d 560.

gathered. The tort concerns publicising a persons private – as opposed to public – life, and must be highly offensive to a 'reasonable person'. The persistent surveillance by UAS that results in a detailed profile of a person's movements, contacts, activities and preferences could, if the information were publicized, breach the tort. As with the Fourth Amendment cases, and Art. 8 of the Canadian Charter discussed above, recording or undertaking surveillance of someone from a public place is not normally an invasion of privacy under these torts. By way of analogy, in *Boring v Google*[288] the plaintiffs argued that Google's capture of imagery of their house up a private roadway was a breach of the torts of intrusion upon seclusion and publicity to private life. They failed as their actions were not considered to be "highly offensive to a person of ordinary sensibilities".[289] The imagery did not capture the plaintiffs personally, and was no more than could be seen by a member of the public visiting the house. The Court did find that Google may have committed a technical trespass.[290]

There is no right of privacy as such in the UK, whether emanating from Constitutional protections, or as a developing tort in its own right. Challenges to infringement of a person's privacy, until recently, has had to fit within an existing property-based tort such as trespass or nuisance, or actions protecting character such as libel or malicious falsehood.[291] In *Kaye v Robertson*[292] a well-known media personality recovering from brain surgery in a private hospital was interviewed and had photographs taken by

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288 *Boring v Google Inc.* (2009) 598 F.Supp.2d 695 (W.D. Pa.); affd. and reversed (2010) 362 Fed. Appx. 273 (3d Cir.).

289 *Boring v Google Inc.* (2010) 362 Fed. Appx. 273 (3d Cir.), at pp 10-11 of the decision.

290 Ibid, at pp 11-13 of the decision.

291 See, for example, the comments of Glidewell LJ in *Kaye v Roberston* [1990] EWCA Civ 21, [1991] FSR 62 (UKCA) at 6-7 of the Judgment.

292 *Kaye v Roberston* [1990] EWCA Civ 21, [1991] FSR 62.

journalists. The UK Court of Appeal held that an invasion of privacy *per se* was not actionable in English law, although it should be the subject of law reform. Any remedy had to rely on existing torts, and in that case the only possible remedy was a claim for malicious falsehood.[293]

In *Wainwright v Home Office*,[294] a case involving intrusive strip-searching, the House of Lords confirmed that there was no general tort of invasion of privacy in the UK. It did accept that an extended breach of confidence action could be used to protect certain privacy interests, although that action was not available in that case.[295]

The Human Rights Act in 1998 (HRA) incorporated the European Convention on Human Rights (ECHR) into English law. Article 8.1 of the Convention expressly provides a right to respect a person's private life, and in 2004 the House of Lords applied the HRA in *Campbell v MGN Ltd*[296] to expand the action for breach of confidence to a more general tort of "misuse of private information".[297] The case involved publication of information and imagery concerning a fashion model's drug addiction and treatment. The majority of the House considered the extent of publication went beyond "freedom of expression" under Art. 10 of the ECHR, and interfered with the plaintiffs rights of privacy.[298] Liability rested on whether a person has a "reasonable expectation of privacy".[299] The House considered the expanded tort did not require any express or implicit element of

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293 *Ibid.*
294 *Wainwright v Home Office* [2003] UKHL 53; [2004] 2 AC 406 (HL).
295 *Ibid*, at paras [30]-[35] per Lord Hoffman
296 *Campbell v MGN Ltd* [2004] UKHL 22; [2004] 2 AC 457 (HL)
297 *Ibid*, at para [13]-[17] per Lord Nicholls. See also para [51] per Lord Hoffman.
298 *Ibid*, at para [36] per Lord Hoffman
299 *Ibid*, at para [21] per Lord Nicholls.

confidentiality in the way the information was given or discovered.[300] The tort was recently applied in relation to the collection of personal information through the use of 'cookies' in the Apple Safari browser by Google Inc.[301] The UK Court of Appeal reaffirmed the tort of "misuse of private information" as a tort to protect an individuals privacy; specifically "the protection of human autonomy and dignity - the right to control the dissemination of information about one's private life and the right to the esteem and respect of other people".[302] The tort has clear potential to apply to the use of UAS, and information collected by such technology, in the UK.

The New Zealand Courts have long recognised the invasion of privacy as a specific common law tort.[303] In *P v D* the New Zealand High Court set out the following elements of the tort:[304]

- A public disclosure of facts;
- The facts disclosed are of a private nature;
- Publication of the facts would be considered highly offensive to a reasonable person; and
- Insufficient legitimate public concern in having the facts made public.

Hosking v Runting[305] concerned publication of photographs of the young children of well-known media personality. In its decision, the Court of Appeal affirmed the tort of

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300 *Ibid*, at paras [13]-[14] per Lord Nicholls, and para [51] per Lord Hoffman.

301 *Google Inc. v Vidal Hall and Ors* [2015] EWCA Civ 311; [2015] 3 WLR 409.

302 *Ibid*, at para [25] per McFarlane MR and Sharp LJ.

303 *Bradley v Wingnut Films* [1993] 1 NZLR 415 at 423, *P v D* [2000] 2 NZLR 591, and *Hosking v Runting* [2005] 1 NZLR 1, *Rogers v Television New Zealand* [2007] 1 NZSC 91; [2008] 2 NZLR 277 at [23]-[26], [98]-[99], and [144]-[145, and *Brooker v Police* [2007] NZSC 30; [2007] 2 NZLR 91 at [40] and [122]. For commentary on the *Hosking* case see D Butler, 'A Tort of Invasion of Privacy in Australia?' *Melbourne University Law Review* 29 (2005): 339, 352–357. See also Andrew Geddis, "*Hosking v Runting*: a privacy tort for New Zealand" *Tort Law Review* 13, no. 1 (2005): 5.

304 *P v D* [2000] 2 NZLR 591 at para [34] per Nicholson J.

305 *Hosking v Runting* [2005] 1 NZLR 1 (CA).

invasion of privacy, but considered the taking of photographs in a public place did not breach it in that case.[306] The elements of the tort were stated as:[307]

- The existence of facts in respect of which there is a reasonable expectation of privacy; and
- Publicity given to those private facts that would be considered highly offensive to an objective reasonable person.

The Supreme Court of New Zealand has acknowledged the existence of the tort, but has not yet confirmed its elements and application.[308] As with other jurisdictions, the availability of the tort is qualified where matters of legitimate public interest justify the invasion:[309]

> It is actionable as a tort to publish information or material in respect of which the plaintiff has a reasonable expectation of privacy, unless that information or material constitutes a matter of legitimate public concern justifying publication in the public interest.

The Court also made the following comment, which is highly relevant in the context of the use of UAS:[310]

> Trespass may be of limited value as an action to protect against information obtained surreptitiously. Long-lens photography, audio surveillance and video surveillance now mean that intrusion is possible without a trespass being committed.

Property rights and UAS in the US, UK and New Zealand

As discussed in Chapter 2 (above) the remedies of nuisance and trespass are available to

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306 *Ibid*, at paras [159] and [163] per Gault P and Blanchard J, [175] per Keith J, [223] and [260] per Tipping J, and [262] per Anderson J.
307 *Ibid*, at para [117] per Gault P and Blanchard J.
308 *Rogers v Television New Zealand* [2007] 1 NZSC 91; *Brooker v Police* [2007] NZSC 30.
309 *Hosking v Runting* [2005] 1 NZLR 1 (CA) at para [129]-[130] per Gault P and Blanchard J, and [259] per Tipping J.
310 *Ibid*, at para [118] per Gault P and Blanchard J.

protect against physical intrusion into a landowners property. These principles are largely settled, and there is little difference between the way the courts in the US, UK and New Zealand approach these matters.[311]

In summary, trespass requires a physical intrusion, and there is case-law that suggests intrusion into the airspace below the height where civil aviation is permitted may constitute a trespass. The intrusion must also interfere with the use and enjoyment of the land and the structures on it. Nuisance requires some interference with the enjoyment of land and has a broader reach than trespass. But again the courts have been reluctant to penalize actions that don't unreasonably interfere with such enjoyment. Actions performed in the process of law enforcement or anti-terrorism operations, are generally considered to be justifiable exceptions to liability.[312]

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311 *Florida v Riley* (1989) 488 U.S. 445.

312 This is covered in more detail in the earlier discussion of trespass and nuisance in Chapter 2 at pp. 20-23.

CHAPTER 5:

CONCLUSIONS AND RECOMMENDATIONS

In this chapter the strengths and weaknesses of the Canadian legal regime when compared with the US, the UK and New Zealand is discussed. The analysis is divided into three parts: first, regulation of civil aviation in the context of reducing conflicts between CF military UAS and other aircraft both domestically and on expeditionary operations; secondly, controlling the proliferation of UAS in the private sector to reduce their potential misuse; and thirdly a comparison of the protections of private rights, freedoms and civil liberties in the use of UAS by CF. This comparative analysis incorporates recommendations for law reform.

Regulation of civil aviation

There has been a significant increase in recent years in the use of UAS in the airways, with pilots reporting sightings and "near misses" with increasing regularity.[313] For the most part military UAS do not carry "sense and avoid" technology and deconfliction relies upon ad hoc cooperation between civil and military aviation air traffic control. This lack of harmonization and integration of air traffic control poses a significant risk of

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313 Gwynn Topham, "Drones in four near-misses at major UK airports, air investigators reveal", *The Guardian*, 29 January 2016, https://www.theguardian.com/technology/2016/jan/29/drones-near-misses-major-uk-airports-heathrow-stansted; Steve Gorman, "Lufthansa reports near miss with drone over Los Angeles", *Reuters*, 19 March 2016, http://www.reuters.com/article/us-california-drone-lufthansa-idUSKCN0WL01B; Mark Harris, "Near misses between drones and airplanes on the rise in US, says FAA", *The Guardian*, 25 March 2016, https://www.theguardian.com/technology/2016/mar/25/near-misses-between-drones-and-airplanes-on-the-rise-in-us-finds-faa,

incidents between civil aircraft and UAS.

Domestic regulation

While non-military use of UAS in Canada is subject to civil aviation regulation, military aircraft are generally not subject to civil aviation rules. There is uncertainty over whether military UAS under the command of a civilian "pilot" lose the military exemption under the CARs.[314] While the TAA – established under the DND – provides reasonably detailed airworthiness, operator qualification, and operational guidance for the use of UAS by the CF, these rules do not appear to be subject to any independent benchmarking, and little accountability outside of the TAA and DND.

In contrast the FAA in the US exercises much greater authority over military air operations, and has imposed strict requirements on UAS operators, whether military or civil.[315] Exemptions can be obtained for military aircraft and UAS, usually in defined areas of airspace, or on a case-by-case basis.[316] Arguably this approach provides better "checks and balances" by requiring military operators to justify their request for exemption from civil aviation rules, and to ensure appropriate safety and deconfliction measures have been implemented.

In the UK the CAA has a very strong role in regulating the use of UAS in UK airspace and must also conform to EU aviation rules. Those rules severely restrict the use of large

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314 CARs, Reg. 102.01 (a) and (b), and see discussion supra pp. 33-40.

315 United States Department of Transportation, FAA, *AC No: 00-1.1A: Advisory Circular Public Aircraft Operations* (Washington, D.C.: FAA, 12 February 2014), at para 7. d. and e, and United States Department of Transportation, FAA, *N JO 7210.891: Unmanned Aircraft Operations in the National Airspace System (NAS)*, (Washington, D.C.: FAA, 25 November 2015).

316 See discussion above at pp. 63-66.

UAS over 150 kg that do not have "sense and avoid" capabilities. As with the TAA in Canada, the UK MAA regulates the use of military aircraft and UAS. In particular, the MAA is required to demonstrate that matters such as airworthiness, training and operational safety meet the standard applicable to civil aviation. There is also a statutory requirement to ensure civil aviation agencies are advised and deconfliction is assured with military UAS operating in civil airspace. For UAS larger than nano and micro-sizes, specific approval is required from the CAA, unless the use is in a pre-approved restricted area.

Military UAS in New Zealand are, arguably, even less regulated than in Canada. The NZDF is expressly not subject to the civil aviation regulatory regime,[317] and apart from the general CICA requirement to "obviate danger to civil aircraft"[318] there is no specific regulation governing the use of UAS in civil airspace. This is largely because of the relatively uncongested airspace in the South Pacific, and also the fact the NZDF does not operate medium or larger UAS at present. The NZDF is undertaking significant research and development of UAS, but such activities are confined to restricted defence areas, or have been approved in remote areas of civil airspace on a case-by-case basis.[319]

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317 Civil Aviation Act 1990 (NZ), s 3(2).

318 CICA, Arts. 3(d) and 8.

319 See Michael Field, "No drones for NZ military, NZDF says", *Dominion Post,* 8 July 2012, http://www.stuff.co.nz/dominion-post/news/politics/7241936/No-drones-for-NZ-military-NZDF-says; Radio New Zealand, "Defence considers wider use of drones", *RNZ online* (18 June 2014), http://www.radionz.co.nz/news/national/247515/defence-considers-wider-use-of-drones; and Kurt Bayer, "NZ military develops spy drones", *NZ Herald,* 6 February 2014, http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11197398.

Recommendations

Amongst the countries studied, the US appears to have the most comprehensive and regulated regime for the safe use of military UAS in civil airspace, with the UK coming a close second. Canada has a common border with the US, there is a close security relationship between the two countries (exemplified through NORAD), joint security operations may require overflight within each other's airspace, and there is significant expeditionary cooperation in joint operations under the NATO, UN or coalition banners. It would therefore seem sensible for Canada to harmonise and integrate – as far as is appropriate – its approach with the US in regulating the use of military UAS in civil airspace.

Offshore and expeditionary operations

As signatories to CICA, Canada, along with the US, UK and New Zealand are subject to international aviation law and ancillary international aviation agreements. International regulation of the use of UAS in civil and international airspace is currently being addressed by a number of agencies, including the ICAO, the European Aviation Safety Agency and IATA.[320]

The use of air assets in expeditionary operations is guided by resolutions of the UNSC and UN SOFAs in the case of UN PKOs, by NATO agreements and SOFAs in the case of NATO operations, or by multi-lateral or bilateral agreements or SOFAs between the

[320] EU, European Aviation Safety Agency, *Technical Opinion: Introduction of a regulatory framework for the operation of unmanned aircraft,* (Cologne: EASA, 2015), and see EASA website at https://www.easa.europa.eu/easa-and-you/civil-drones-rpas. See also ICAO, Circular 328, at paras 1.7 and 2.5, available at http://www.icao.int/Meetings/UAS/Pages/UAS_Documents.aspx, and IATA website at http://www.iata.org/whatwedo/safety/Pages/remotely-piloted-aircraft-systems.aspx.

occupied country and the contributing nations. The UN has directly addressed the use of UAS in PKO, and contributing nations will be expected to follow these guidelines.[321] The use of UAS is not expressly addressed in NATO instruments and standard SOFAs, or in other PKO or humanitarian intervention agreements and SOFAs. In such cases there is general reliance on the freedoms allowed for the use of aircraft in furtherance of the mission, and a requirement to comply with the occupied country's aviation rules and air traffic control. However, in a challenged or failed state scenario such rules are often nascent, not enforced or non-existent.

Recommendations

Canada has addressed in detail the use of UAS on such missions through specific CONOPS.[322] It is unknown the extent to which the US, UK or Australasian military has directly addressed the use of UAS on expeditionary operations, as this information is either classified, or difficult to acquire. Nevertheless, clarification and direction on the operator training, airworthiness and deployment conditions for the use of UAS through higher level DND instructions and Defence Administrative Orders and Directives would seem to be appropriate.

Controlling the use of UAS by the private sector and individuals

As with the use of military UAS, the availability and use of UAS in the private sector and by individuals is increasing dramatically. Most jurisdictions have struggled to keep pace

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321 See discussion above at pp. 57-62.

322 For example, DND, *Project Noctua CU170 Heron Unmanned Aerial Vehicle (UAV) Concept of Operations (CONOPS)*, issued by Commander Canadian Expeditionary Forces Command, 25 May 2009, version 1.1, discussion above at pp. 60-61.

with this phenomenon, and have been playing "catch-up" with regulation. Two aspects are of particular concern. The first is the problem of controlling the private and recreational use of UAS in public places and civil airspace while supporting civil liberties and freedoms. The second is the problem of the misuse of UAS by criminals and terrorists.

Controlling private and recreational use of UAVs and UAS[323]

For the most part such use is confined to smaller UAVs ranging from nano or micro-size of a few kg or less, to larger commercial UAVs/UAS up to 150 kg. In most jurisdictions there is relatively light regulation of small UAVs, but larger and commercially used UAVs/UAS are subject to much stricter regulation.

Canada allows the private and recreational use of UAVs of less than 35 kg without civil aviation permission provided the operator complies with certain rules.[324] No training or certification of the operator is required, and no licencing of the UAV/UAS is required. This is an unsatisfactory situation, particularly given the increasing capabilities in terms of altitude and endurance of UAVs, and the damage or disruption that a larger UAV approaching 35 kg could do to a fast moving aircraft or air operations, including those involved in disaster relief, firefighting operations, or other emergency. For commercial UAS of any size, and all UAS of larger than 35 kg, the operator requires a Special Flight Operations Certificate from Transport Canada (TC). However, exemptions are available for commercial use of UAVs of less than 25 kg provided certain conditions are met. If the UAV is between 2 kg and 25 kg operations must be notified to TC. Again, this leaves a

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323 In this and the following sections the term UAV will be used for smaller stand-alone unmanned craft, and UAS for commercial and larger craft that are likely to be part of a "system".

324 See Figure 1, supra at p 37, for details.

wide discretion for self-policing amongst commercial users in respect of compliance. Monitoring and policing of these requirements will be nigh on impossible for TC.

The US has a similar regime allowing UAVs less than 55 lb (approx. 25 kg) to be used without FAA permission, provided the operator complies with requirements such as keeping the UAV at least 5 miles away from airports, 400 ft clear of manned aircraft, and away from assemblies of people and stadiums. For UAV of 55 lb or more, a "Special Airworthiness certificate" is required from the FAA, unless the operator qualifies for an exemption in a low-risk controlled environment. In December 2015 new regulations came into force requiring registration with the FAA of all UAS between half a pound and 55 lb (228g - 22.7kg) before their first flight.[325] Fines of up to $27,500 for non-registration, and up to $250,000 and three years in jail for serious UAS offences are available.[326]

The UK has a strict regime for commercial and recreational UAS use. UAS must meet at least the same standards for safety and operation as manned aircraft, and there are strict operator training and qualification requirements. Smaller UAS of 20 kg or less do not require approvals but must comply with strict conditions, including a maximum 400 ft height, and a separation of at least 150 m from congested areas and assemblies of people.

New Zealand has taken a very permissive approach to commercial use of UAS with no distinction made between commercial and recreational use. Regulation is based on size

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325 See US, Department of Transportation, FAA, "Unmanned Aircraft Systems (UAS) Registration", FAA website at https://www.faa.gov/uas/registration/.

326 US, Department of Transportation, FAA, "The FAA Reminds You to Register Your Drone", *FAA News & Updates*, 16 February 2016, FAA website, at https://www.faa.gov/news/updates/?newsId=84807.

with a UAS of 25 kg or less able to be flown without authorization provided the operator complies with rules including a maximum height of 400 ft, and at least 4 km from airports. If it is to be flown over persons or private property, consent must be obtained from affected people. This is a very restrictive provision particularly where crowds may be involved. It is also practically difficult to enforce. For UAS over 25 kg, a much stricter set of requirements applies including acquiring from the CAA NZ an "Unmanned Aircraft Operators Certificate". A novel part of this process is satisfying the CAA that the operator is a "fit and proper person" to hold the Certificate. Again this is an interesting approach leaving considerable discretion to the agency to determine who is a "fit and proper person" in any particular case. While somewhat vague in its present form, this requirement is a useful innovation for licencing of larger UAS.

Recommendations

The Canadian approach is similar to the other jurisdictions, with a generous minimum weight limit before stricter licencing and authorization requirements apply. It would seem that the lower weight limits of 20-25 kg that are applied in the US, the UK and New Zealand minimize the risk to civil aircraft, people and property if a collision or malfunction occurs. For aircraft over that weight requiring both an airworthiness certification and an operator qualification (as in both US and NZ), would be desirable. Licencing of such aircraft in a central registry of owners and operators – as has recently been introduced in the US – would have significant advantages for policing and security considerations. The New Zealand "fit and proper person" requirement for licencing operators may be an approach worth considering.

Addressing national security concerns about the misuse of UAVs and UAS

There is evidence that UAS have been used by criminal and terrorist elements for surveillance and reconnaissance, and to carry payloads of explosives, or other dangerous items such as NCBR materials.[327] It is likely they will be increasingly used against aircraft, vessels, buildings, or assemblies of people as in large stadiums or at outdoor events. This is a very challenging area, as whatever regulatory regime is put in place to licence operators, certify UAS, and create a register of UAS, criminal elements and terrorists will either ignore these requirements or find a way around them. Homebuilt UAS also "fly under the radar" and are impossible to capture with regulation. Public Safety Canada has developed strategies to address the threats of domestic terrorism, but there is little directly focused on the use of UAS by criminal and terrorist elements.[328]

Recommendations

As can be seen in the preceding section, all jurisdictions, including Canada, have relaxed rules about licencing smaller UAS and operators of such craft. To control access to such equipment by criminals and terrorists there would need to be some import/export controls put in place, along with strict rules for wholesalers and retailers. This would be an

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327 Chris Abbott, Matthew Clarke, Steve Hathorn and Scott Hickie, *Hostile Drones: The Hostile Use of Drones by Non-state Actors Against British Targets*, Report of the Remote Control Project of the Oxford Research Group, (London: Remote Control Project, 2016), http://remotecontrolproject.org/wp-content/uploads/2016/01/Hostile-use-of-drones-report_open-briefing.pdf. See also Jack Nicas, "Criminals, Terrorists Find Uses for Drones, Raising Concerns", *The Wall Street Journal,* 28 January 2015, http://www.wsj.com/articles/criminals-terrorists-find-uses-for-drones-raising-concerns-1422494268; Matthew Weaver, "UK should prepare for use of drones in terrorist attacks, says thinktank", *The Guardian,* 11 January 2016, http://www.theguardian.com/uk-news/2016/jan/11/drones-terrorist-attacks-security-thinktank.

328 Public Safety Canada, *Building Resilience Against Terrorism: Canada's Counter-Terrorism Strategy* (Ottawa: Public Safety Canada, 2012), http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/rslnc-gnst-trrrsm/index-en.aspx. Annex A of this document has a very useful review of the counter-terrorism legal framework.

immense task, but it could be modeled on the approach to sales of weapons for private and recreational use. Ideally private importers and purchasers of UAS should have to acquire a licence to import or to own, give full verifiable personal details including address and contact details, and should be required to provide references and show that they are a "fit and proper person" to own and/or operate UAS provided this requirement can be defined more concisely through clear criteria (eg, no criminal convictions, no affiliations with political activist organisations, good character references from several people). A licencing regime for owners and operators of UAS – as recently introduced in the US (see above) – would also be desirable. These measures require some sophisticated cost-benefit analysis, as even such controls may be easily avoided or subverted by a determined terrorist. But the consequences of a successful UAS attack in the ways described above could be incalculable.

Balancing private rights and civil liberties with the use of UAS by CF

This third area of concern is perhaps the most intractable. The human rights and civil liberties are at the heart of the way of life and democratic ideals of countries like Canada and her allies. Unfortunately rapid technological and IT development is making technology and systems of great destructive power widely available to all. Basic human rights and private rights should not only protect civil liberties, but also the right to live one's life free from the fear of violence and attack by criminal terrorist or extremist elements. Striking this balance will necessitate compromise and restriction of some private rights and civil liberties in the interests of the greater benefits of national security. Inevitably there will need to be greater domestic surveillance and the ability to enter and

search property, and detain and question suspected criminals and terrorists expeditiously before communications records, data and other digital evidence is destroyed or digital pathways obliterated. This will often require the assistance of military assets such as UAS due to their sophisticated surveillance and communications technology.

Constitutional and legal protections

Whether a state has a written constitution (such as Canada and the US), or unwritten constitutional conventions (such as the UK and New Zealand), basic human rights and protections against unreasonable detention, search and seizure are generally enforced by the Courts. As discussed in the preceding chapters, there are exceptions where the surveillance, search and seizure is in the national interest, such as with law enforcement or protecting national security. Unfortunately the circumstances where such exceptions may apply are often not clearly spelled out in legislation, nor are they clearly expressed in government and security agency policies. This leaves a great area of potential discretion, which may potentially be abused by agencies using UAS for search and surveillance.

In the US the courts, both at federal and state level, have been vigilant in protecting civil liberties and personal freedoms, but have also been responsible in recognizing appropriate exceptions.[329] In Canada the constitutional protections are less extensive, and the courts have tended towards allowing police and security agencies more flexibility in invading a

[329] See *Kyllo v United States* (2001) 533 U.S. 27 (use of thermal imaging on home an unreasonable search), *United States v Jones* (2012) 132 S. Ct. 945 (use of GPS devise to monitor vehicle movements was unlawful search), and on the other side, *United States v Katzin* (2014) 769 F. 3d. 163 (3d Cir.) (warrantless use of GPS by FBI was a breach of 4th Amendment, but justified under the "good faith" exception).

person's private life and property if there is a clear law enforcement justification. Cases like *Tessling*[330] show the courts are aware of the issues posed by increasingly sophisticated surveillance technology such as that used in UAS, but have not yet definitively grappled with them in an appropriate contest.

Recommendations

Lessons can also be learnt from New Zealand, where Parliament recently enacted the Search and Surveillance Act 2012 (NZ). This measure attempts to bring search and seizure powers into the modern technological age with innovations like more streamlined search warrant procedures, warrantless search and seizure in closely circumscribed situations, and computer surveillance, search and data interception. Along with this modernization of search, seizure and surveillance that both recognize, and uses, modern technology, the Act also attempts to balance the need to protect civil liberties and personal freedoms.[331] While the Act does extend the powers of search and surveillance of police and security agencies and is directly relevant to the use of UAS in such operations, it also clarifies the limits of these powers and the rights of individuals to object to abuses of power. This measure could provide a useful model for Canada.

Privacy, property and the common law

All jurisdictions examined had a high level of statutory protection for communications, documentary and personal privacy. Along with the US, Canada is a leader in this area with legislation addressing the privacy obligations of government departments, access to

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330 *R v Tessling* [2004] 3 S.C.R. 432, discussed above at pp 41-42.

331 Search and Surveillance Act 2012 (NZ), s 5 (Purpose). See also New Zealand Bill of Rights Act 1990 (NZ), Privacy Act 1993 (NZ), and Evidence Act 2006 (NZ).

information, the creation of a Privacy Commissioner, and the regulation of documentary privacy in the private sector. The Privacy Commissioner has published guidelines for "overt" video surveillance by the private sector, including matters like shutter control, secure storage of imagery and data, and destruction of same when no longer required.[332] These guidelines could be broadened to apply to government departments and agencies generally.

In terms of the common law protections for privacy, the higher courts in Canada have not yet recognized a tort of invasion of privacy,[333] although some provincial and lower court decisions have suggested it is timely given the rapid technological changes allowing greater intrusions on individual privacy including the potential for such intrusions through the use of UAS.[334]

The US courts are the most advanced in their recognition and development of rights of individual privacy placing some reliance on the Fourth Amendment and other provisions in the *US Constitution*.[335] In recent years the UK has expanded the tort of misuse of private information to a more generalized protection of individual privacy,[336] and New Zealand courts have long recognized a tort of invasion of privacy.[337]

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332 Privacy Commissioner of Canada, *Guidelines for Overt Video Surveillance in the Private Sector*, (Ottawa: Privacy Commissioner, 2008), https://www.priv.gc.ca/information/guide/2008/gl_vs_080306_e.ASP.

333 See discussion above at pp. 45-47.

334 See, for example, *Dyne Holding Ltd v Royal Insurance Co. of Canada* (1996) 135 DLR (4th) 142 at 160 per Carruthers CJ, and *Somwar v McDonalds Restaurants of Canada Ltd* (2006) 79 O.R. (3d) 172.

335 See discussion above at pp. 71-73 and cases referred to therein.

336 See, for example, *Google Inc. v Vidal Hall and Ors.* [2015] EWCA Civ. 311 esp at para [25] per McFarlane MR and Sharpe LJ.

337 See, for example, *Hosking v Runting* [2005] 1 NZLR 1 (CA) at paras [118] and [129]-[130] per Gault P and Blanchard J.

Recommendations

While Canada has lagged behind judicial developments in other parts of the world, it is moving in a similar direction. It would be unwise to attempt to legislate for an enforceable tort of invasion of privacy as this would restrict the discretion of the Courts to apply such a remedy to a wide variety of situations, many as yet unimagined given the pace of technological development.

In terms of property rights, these are fairly consistent across all jurisdictions, and the torts of trespass and nuisance operate to restrict the intrusion of UAS into the airspace above a person's property. The general rule is that where the intrusion is within normal civil airspace, or otherwise involves nothing that a member of the public cannot do (such as looking into property from another building), then there is no actionable intrusion.[338] Nevertheless the civil aviation restrictions can be unnecessarily limiting in some cases, and regulation that clearly defines the airspace parameters of police or military UAS over property would be useful. There are challenges with that. In many jurisdictions, including Canada, the low altitude ceiling for civil aviation over populated areas is 1,000 ft above ground level (AGL), or in some cases 500 ft for helicopters. That allows the police (or military if assisting the civil authorities) to use helicopters for surveillance, but not UAS unless specifically approved for use in civil airspace. The maximum height for smaller UAS is 400 ft unless special authorization is held. Therefore the use of UAS at 400 ft or below may well be an actionable trespass or nuisance in terms of a property owners rights. One solution would be to provide by statute for a minimum height of 350 ft AGL for

[338] See, for example, in the US: *Florida v Riley* (1989) 488 U.S. 445, *Chemical Co v United States* (1986) 476 U.S. 227, *California v Ciraolo* (1986) 476 U.S. 207; and in Canada: *R v Tessling,* [2004] 3 S.C.R. 432.

UAS operating over private property, as this would give a "buffer" zone of legitimate surveillance operations. With increasing resolution of cameras, even this height would provide little privacy protection for property owners. Regulations could restrict the duration of surveillance to shorter periods (eg, 60 minutes) where no warrant has been obtained, but requiring a court order or reasonable cause for extended periods (eg, 48 hours), or a warrant and probably cause for surveillance for longer periods (eg, more than 48 hours).[339] Regulations could also be implemented to restrict retention of data and access to it, and requiring transparency and accountability procedures for government agencies, including the CF, for the use of UAS and other surveillance devices.[340]

General conclusion

As tye above discussion demonstrates, striking the appropriate balance between aviation safety, national security, human rights and private rights in an era of increased threat from global terrorism and criminal activity is a major challenge for governments, the military and other law enforcement agencies. The rapid advances in technology, and increased availability of UAVs and UAS in both the public and private sector, has outpaced government policy and regulation in Canada, as it has in other comparable jurisdictions. There is clearly a need for Canada and its allies to address these challenges as a priority, and to provide not only better but also smarter regulation and clearer government policy on the use of UAVs and UAS in all sectors of society. This includes the use of unarmed military UAS by the CF for surveillance and reconnaissance and the need to resolve

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339 For a full discussion of these proposals, see Gregory McNeal, *Drones and Aerial Surveillance: Considerations for Legislators* (Washington, D.C.: Brookings Institute, 2014) esp at 11-18.

340 *Ibid*, at 18-21.

potential civil – military aviation conflicts, the use of UAS in other public sector operations including law enforcement, their use in the private sector, and the potential for their use in acts of terrorism. It is hoped this paper provides some useful analysis of current approaches in Canada and comparable jurisdictions, and recommendations that may be considered by policy-makers and legislators.

APPENDIX 1:

MARITIME ZONES UNDER UNCLOS

Baseline

The baseline is the line from which the Inland Waters, Territorial Sea, Contiguous Zone, Exclusive Economic Zone, and Continental Shelf are measured. The *Baseline* is defined in UNCLOS as "the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State" except where there are deeply indented coastlines, mouths of rivers and bays where the headland is 24 nm or less, straight lines may be drawn.[341]

Internal waters

These are the waters on the landward side of the baseline, including rivers that flow into the sea, bays which have a straight baseline across their mouths, and all inland rivers, waterways and lakes.[342]

The Territorial Sea (TS)

The area extending outwards from the *Baseline* to the 12 nm limit. TS extending outwards from the "baseline" (generally the low water mark). The TS is considered part of the sovereign territory of a coastal state, and all domestic laws apply in full measure to

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341 UNCLOS, Part II, Arts. 5-10.
342 *Ibid*, Part II, Art. 8.

this zone. Even within the TS vessels of other states enjoy a right of "innocent passage".[343] Threats to use, or the actual use of force, the use of weapons and surveillance against the interests of the coastal state would not be within the definition of "innocent passage". [344] Within the TS both military and civilian authorities normally have jurisdiction under relevant statutes and rules of law.

The Contiguous Zone (CZ)

The CZ is the area between the 12 nm limit of the TS to a distance offshore of 24 nm. While not technically a part of a coastal state's sovereign territory, territorial jurisdiction in respect of customs, fiscal, immigration and sanitary laws does extend into this area.[345] Thus the use of UAS for surveillance in connection with those functions would be subject to similar rules as in the territorial zone.

The Exclusive economic zone (EEZ)

The EEZ is the area measured from the *Baseline* to a distance offshore of 200 nm. From the 12 nm limit of the TS, the EEZ is not a part of a state's sovereign territory, but the state can exercise "sovereign rights" for managing natural resources such as fisheries and "energy from the water, currents and winds".[346] Otherwise the EEZ is regarded as the high seas with other states having the right of freedom of navigation.

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343 Defined in Part II, Art.19(1) of UNCLOS as "Passage [that] is not prejudicial to the peace, good order or security of the coastal State."

344 UNCLOS, Part II, Art. 19(2).

345 *Ibid*, Part II, Art. 33.

346 *Ibid*, Part V, Art. 56.

The Continental shelf (CS)

The CS covers the seabed and subsoil of the extent of the natural prolongation of Canada's land territory or the 200 nm EEZ whichever is the greater. A coastal state can exercise "sovereign rights" to explore and exploit the natural resources on or under the seabed including minerals and hydrocarbons.[347]

The "High Seas"

The maritime areas beyond the TS, including the EEZ and CS, are regarded as the high seas, with other states enjoying freedom of navigation.[348] The high seas are reserved for peaceful purposes, and no claims of sovereignty can be made by any state.[349] The principle of *mare liberum* applies in full measure, with vessels navigating the high seas usually only subject to the jurisdiction of their flag State. These freedoms are subject to a coastal state's economic rights in the EEZ and CS, and the rights and interests of other States at international law.[350] Ships on the high seas have various rights and obligations, including the requirement to carry a flag, to obligation render assistance, the right to seize vessels or aircraft involved in piracy or slavery, and the right of hot pursuit.[351]

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347 *Ibid*, Part VI, Art. 77.
348 *Ibid*, Part VI, Art. 78.
349 *Ibid*, Part VII, Arts. 88 and 89.
350 *Ibid*, Part VII, Art 87.
351 *Ibid*, Part VII, Art. 111.

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