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STUDY OF UNMANNED AIR VEHICLE REGULATIONS: AN INTERIM REPORT

Report of the Standing Committee on Transport, Infrastructure and Communities

Hon. Judy A. Sgro
Chair

FEBRUARY 2017

42nd PARLIAMENT, 1st SESSION

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THE STANDING COMMITTEE ON TRANSPORT, INFRASTRUCTURE AND COMMUNITIES

has the honour to present its

TENTH REPORT

Pursuant to its mandate under Standing Order 108(2), the Committee has studied Unmanned Aerial Vehicle (UAV) Regulations and has agreed to report the following:

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STUDY OF UNMANNED AIR VEHICLE REGULATIONS: AN INTERIM REPORT

INTRODUCTION

Unmanned air vehicles (UAVs or drones) benefit society in many ways.[1] UAVs provide a low-cost and low-emissions alternative to using piloted aircraft in many industrial sectors; from forestry and mining to film production and scientific research. UAVs also offer law enforcement officers and other first responders previously unavailable perspectives of accident scenes, while keeping officers out of harm's way during public emergencies. The UAV industry is growing very rapidly with businesses that develop, test, manufacture and sell UAVs and their components generating significant activity in the economies where they are located.

The federal government has exclusive jurisdiction over aviation in Canada. Transport Canada, the aviation regulator, made regulations that enabled the lawful operation of UAVs by operators who possess Special Flight Operating Certificates (SFOCs).[2] The use of smaller UAVs was exempted from the certificate requirement in 2014 on the condition that they follow Transport Canada guidelines for where and how to fly UAVs safely.[3]

Despite the establishment of safety regulations and guidelines, UAVs can pose an increasing risk to piloted aircraft as well as people and property on the ground. Recreational users, which outnumber commercial operators, were identified as the greatest safety concern as they lack awareness of the risks and may not know how to operate UAVs safely.

The Minister of Transport recently announced Transportation 2030, which is the Government of Canada's strategic plan for the future of transportation in Canada.[4] One of the government commitments proposed, in the part of the plan intended to reduce air pollution and embrace new technologies, is to ensure that UAVs are subject to simple, clear and enforceable regulations.

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1 While there are many terms used to refer to what is most commonly called a "drone," such as unmanned air or aerial vehicle (UAV) and unmanned aircraft system (UAS), this report uses the term unmanned air vehicle (UAV) throughout. In the *Canadian Aviation Regulations* (SOR/96-433), "unmanned air vehicle" means a power-driven aircraft, other than a model aircraft, that is designed to fly without a human operator on board.

2 Transport Canada, "Review and Processing of an Application for a Special Flight Operations Certificate for the Operation of an Unmanned Air Vehicle (UAV) System," *Staff Instruction (SI) No. 623-001*, 27 November 2011, paragraph 4.3.

3 Transport Canada, Exemption from Sections 602.41 and 603.66 of the Canadian Aviation Regulations (under 1 kg) and Transport Canada, *Exemption from Sections 602.41 and 603.66 of the* Canadian Aviation Regulations (between 1 and 25 kg).

4 Government of Canada, "Minister Garneau presents his strategy for the future of transportation in Canada: Transportation 2030," *News Release*, 3 November 2016.

The House of Commons Standing Committee on Transport, Infrastructure and Communities (TRAN or the Committee) commenced a study of UAV regulations in November 2016. To date, the Committee has convened five meetings with witnesses in Ottawa; witnesses represented a range of stakeholders including representatives of the traditional ("piloted") aviation industry, UAV manufacturers and users, Transport Canada and the Royal Canadian Mounted Police. All stakeholders supported growth in UAV operations and this interim report describes their key views with respect to the competitive environment for UAV policy globally, new regulations for UAV users in Canada, and the tools available for dealing with privacy intrusions and criminal activities perpetrated by UAV operators. Although the Committee may continue its study of UAV regulations in 2017, it has decided to prepare a report in the interim with recommendations for the Government of Canada to improve UAV safety and foster the Canadian UAV industry.

CANADA'S PLACE IN THE GLOBAL UNMANNED AIR VEHICLE POLICY ENVIRONMENT

Before the Committee, Ian Glenn of ING Robotic Aviation Inc. and Doug Johnson of the Consumer Technology Association explained that there is currently global competition to attract private investment in the UAV industry and those countries with the most flexible rules for UAVs are expected to attract the high-value UAV businesses to conduct research and testing.[5] The Committee learned from Transport Canada that, until the United States passed legislation with respect to the lawful commercial use of UAVs in the summer of 2016, Canada was the UAV policy leader of the two countries. A representative of Transport Canada told the Committee that the United States has also established dedicated resources for UAVs at the federal level to implement regulations and to foster development and use of the technology.[6] Some witnesses suggested to the Committee that Canada will have to advance UAV policy rapidly in order to remain relevant and allow a Canadian UAV industry to become established.[7]

The UAV industry has developed rapidly in Canada, as it has around the world. Transport Canada issued fewer than 200 SFOCs in 2011; that number increased to nearly 4,000 in 2015. Some stakeholders told the Committee that the SFOC process is too slow to meet the needs of some commercial UAV users.[8] According to Anne-Sophie Riopel-Bouvier, Vice President at EXO Tactik Air Support, Transport Canada has only a few staff dedicated to issuing UAV permits and that delays range from one to three months to

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5 House of Commons Standing Committee on Transport, Infrastructure and Communities (TRAN), Evidence, 42nd Parliament, 1st Session, 24 November 2016, 0850 (Ian Glenn, Chief Executive Officer, ING Robotic Aviation Inc.); Evidence, 29 November 2016, 0850 (Doug Johnson, Technology Policy, Consumer Technology Association). All Evidence cited hereafter is from the 42nd Parliament, 1st Session unless otherwise noted.

6 Transport Canada, Brief, 1 December 2016, p.3.

7 TRAN, Evidence, 22 November 2016, 1000 (David Fraser, As an individual); Evidence, 24 November 2016, 0850 (Mark Aruja, Chairman of the Board, Unmanned Systems Canada), 0850 (Ian Glenn, Chief Executive Officer, ING Robotic Aviation Inc.), 0950 (Tony Di Benedetteo, Chief Executive Officer, Drone Delivery Canada), 0955 (Kerry Moher, Vice-President, Business Development, Fresh Air Educators).

8 TRAN, Evidence, 24 November 2016, 0910 (Anne-Sophie Riopel-Bouvier, Vice President, Operations, EXO Tactik Air Support), 0910 ING Robotic Aviation Inc., 1020 UAS.

obtain a permit[9]. Some witnesses, such as Mr. Glenn, reported that they had lost a considerable amount of business because they could not acquire the required authorization quickly enough.[10] Marc Moffat, Director General at UAS Centre of Excellence, noted before the Committee that the SFOC process is not consistent across the country and should be standardized.[11] Mr. Glenn suggested that Transport Canada needs to allocate more personnel and resources in order to foster and safely regulate this industry, particularly as UAVs begin to outnumber manned aircraft.[12]

A number of witnesses testified that new UAV products are available almost continuously.[13] While it is difficult to predict the future of UAV technology, users assert that beyond visual line of sight (BVLOS) operations are necessary to realize the full benefits of the technology in the mining, forestry and pipeline industries as well as in other applications.[14] Mr. Mark Aruja, Chairman of the Board of Unmanned Systems Canada told the Committee that other jurisdictions, such as the United Kingdom, France, Australia and the United States are already moving ahead on BVLOS rules.[15] Several UAV users and businesses suggested to the Committee that BVLOS regulations should be a priority.[16] Other anticipated operations for which rules will be needed include night flights and flights over people and in urban environments. Transport Canada officials acknowledged that the department must develop and implement regulations for BVLOS operations. The officials also told the Committee that the department wants to enable the Canadian drone industry. The department has allocated airspace to create dedicated UAV test sites in Alberta and Quebec.

The Committee believes that rules for UAVs should be flexible to allow for rapid technological innovation and industry growth in Canada. The Committee recommends:

RECOMMENDATION 1

That any future government regulatory framework for unmanned air vehicles be appropriately flexible so as to ensure the ability to effectively adapt in order to keep pace with a rapidly evolving industry and the varying needs of Canadians, while continuing to balance the public interest for safety and security.

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9 Ibid.

10 Ibid, 0910 (EXO Tactik, ING Robotic Aviation Inc.).

11 TRAN, Evidence, 24 November 2016,1000 (Marc Moffat, Director General, UAS Centre of Excellence).

12 TRAN, Evidence, 24 November 2016 0850 (ING Robotic Aviation Inc.).

13 TRAN, Evidence, 24 November 2016, 1025 (DDC); Evidence, 29 November 2016, 1005 (Staff Sergeant David Domoney, National Traffic Services, Royal Canadian Mounted Police).

14 TRAN, Evidence, 24 November 2016, 0845 (Unmanned SystemsCanada), 1020 (UAS Centre of Excellence).

15 TRAN, Evidence, 24 November 2016, 0925 (Unmanned SystemsCanada).

16 TRAN, Evidence, 24 November 2016, 0845 (Unmanned Systems Canada), 0850, 1020 (ING Robotic Aviation Inc.), 1000 (UAS).

RECOMMENDATION 2

That Transport Canada designate additional, safely-situated airspace for unmanned air vehicle testing, training, and recreational use.

Witnesses, including Transport Canada, mentioned that alignment with the U.S. rules for UAVs is in Canada's interest[17] and therefore the Committee recommends:

RECOMMENDATION 3

That any future government regulatory framework for unmanned air vehicles appropriately complement the regulatory structures utilized by the United States in an effort to establish and maintain a seamless and effective cross-border regulatory environment.

As efforts to develop UAV technology are widespread and considering that important advances could be realized by hobbyists, the Committee recommends:

RECOMMENDATION 4

That Transport Canada, the unmanned air vehicle manufacturing industry and commercial operators work together in order to actively engage with private individuals who are involved in experimental modifications to unmanned air vehicles. This may be done through a co-funded program designed to encourage, recognize, and reward innovation.

UNMANNED AIR VEHICLE REGULATIONS

Transport Canada has identified UAVs as one of the top safety risks in Canadian aviation and published a notice of proposed amendment to the UAV regulations in 2015. According to Transport Canada officials, the proposal seeks to shift to risk-based regulation rather than one that differentiates between recreational and commercial UAV users. The assessed level of risk posed by a UAV would depend on the potential danger to aircraft as well as to persons and property on the ground. In a higher-risk operating environment, the regulations would impose more stringent requirements in terms of a UAV pilot's knowledge and with respect to registration, identification and design standards for the UAV in question. Furthermore, Transport Canada officials told the Committee that the department is planning to publish regulations for small UAVs (i.e., less than 25 kg) operated within visual line-of-sight in Part 1 of the *Canada Gazette* in spring 2017.[18]

17 TRAN, Evidence, 22 November 2016, 1000 (Fraser); Evidence 24 November 2016, 1005 (Fresh Air); Evidence, 29 November 2016, 0915 (Consumer Technology Association), 0950 (Aaron McCrorie, Director General, Civil Aviation, Department of Transport).

18 TRAN, Evidence, 29 November 2016, 1020 (Laureen Kinney, Assistant Deputy Minister, Safety and Security, Department of Transport).

With respect to Transport Canada's general approach to regulating UAVs, the Committee recommends:

RECOMMENDATION 5

That any future government regulatory framework place an appropriate onus on unmanned air vehicle manufacturers, and on the industry at large, to assist in maintaining the continued safety of all Canadians within an environment that includes the responsible use of unmanned air vehicles and unmanned air vehicle technologies.

RECOMMENDATION 6

That Transport Canada introduce classes of unmanned air vehicles and that each class be regulated in a manner that considers the common elements of the unmanned air vehicles of that class.

RECOMMENDATION 7

That Transport Canada assess the appropriateness of immediately regulating the use of robot unmanned air vehicles, which fly without any human intervention.

RECOMMENDATION 8

That the federal government grant Transport Canada greater regulatory authority over recreational and commercial unmanned air vehicles and increase its relevant budget accordingly.

RECOMMENDATION 9

That the federal government ensure that regulation of the commercial use of unmanned air vehicles is not exclusively subject to self-regulation standards.

RECOMMENDATION 10

That the federal government ensure that unmanned air vehicle regulations do not unreasonably restrict access to their recreational use.

The following sections summarize witnesses' main points concerning various aspects of the anticipated UAV regulations.

REGISTRATION AND MARKING OF UNMANNED AIR VEHICLES

Several stakeholders who appeared before the Committee recommended requirements that UAVs be registered.[19] Registration is viewed as important because it

19 TRAN, Evidence, 22 November 2016, 0945 (Captain Dan Adamus, President, Canada Board, Air Line Pilots Association International (ALPA)), 0955 (Bernard Gervais, President and Chief Executive Officer, Canadian Owners and Pilots Association (COPA)); Evidence, 29 November 2016, 0850 (Stephen Wilcox, Oshawa

would provide the identity of UAV owners to authorities in case of problems as well as instill a sense of responsibility in operators. The Canadian Airports Council additionally proposed that marking UAVs could be effective in linking them to their owners.[20] The Air Line Pilots Association International (ALPA) suggested that registration could easily be implemented at the point of sale.[21]

The Committee recommends:

RECOMMENDATION 11

That the federal government require permanent markings (eg. electronic or physical) for unmanned air vehicles.

OPERATING REQUIREMENTS AND RULES

Most witnesses stressed the importance of appropriate education for UAV users to promote safe operations. Knowledge of the operating environment was deemed essential for all UAV users. A representative of ALPA recommended to the Committee that a commercial pilot certificate be required for individuals who operate drones on a for-hire basis.[22] For recreational UAV users, a few witnesses suggested that Transport Canada's established pleasure craft licence model, which involves registration, proof of safety knowledge and insurance, would be more appropriate and would allow for rapid adoption.[23]

As discussed previously in this report, it is important for Canada to adopt a flexible regulatory framework for UAVs in order for Canadian businesses to remain competitive. Given that there is a need to balance this goal with the necessity for users to have the appropriate knowledge and training to operate their UAVs, the Committee recommends:

RECOMMENDATION 12

That Transport Canada streamline the pilot certification process for commercial and professional unmanned air vehicle pilots in the interests of ensuring Canada's competitive advantage in this high-growth sector.

Executive Airport, Canadian Airports Council), 0915 (Doug Johnson, Vice President, Technology Policy, Consumer Technology Association); Evidence, 6 December 2016, 1000 (Rudy Kellar, Executive Vice-President, Service Delivery, NAV CANADA).

20 TRAN, Evidence, 29 November 2016, 0950 (Mr. Stephen Wilcox, Airport Manager, Oshawa Executive Airport, Canadian Airports Council).

21 TRAN, Evidence, 22 November 2016, 0945 (Captain Dan Adamus, President, Canada Board, Air Line Pilots Association International).

22 TRAN, Evidence, 22 November 2016, 0945 (ALPA).

23 TRAN, Evidence, 22 November 2016, 1005 (Fraser), 1010 (COPA), 1030 (ALPA).

RECOMMENDATION 13

That any government regulatory framework adopt a public education program, working in conjunction with key industry stakeholders, to educate users of the rules, responsibilities (operational and ethical), regulations, and risks associated with unmanned air vehicles and the regulatory criteria that apply to the unmanned air vehicles they own or manage.

RECOMMENDATION 14

That the committee recommend that Transport Canada require a permit for all pilots of commercial and professional unmanned air vehicles and that Transport Canada study the possibility of requiring a permit for pilots of recreational unmanned air vehicles that pose a risk to the public based on size, speed or other factors.

Those witnesses who commented on operating rules for UAVs generally signalled support for the direction already taken by Transport Canada in its guidelines for small UAVs operated within visual line-of-sight. The ALPA spokesperson recommended that recreational users should adhere to established guidelines concerning flying UAVs at low altitudes, in sight and at least 9 km from aerodromes.[24] The spokesperson also indicated that the danger inherent in UAVs was also in the density of their composition. In its presentation to the Committee, NAV Canada also expressed support for minimum distances from aerodromes.[25]

Given that even small UAVs can cause damage to aircraft flying at high speeds,[26] the Committee recommends:

RECOMMENDATION 15

That any future government regulatory framework establishes regulations for speed and altitude for unmanned air vehicles in controlled airspace.

DESIGN STANDARDS

Witness recommendations for UAV design standards principally concerned technologies that would prevent UAVs from colliding with piloted aircraft and from going where they are not supposed to go.

Witnesses from both the aviation and UAV industries proposed equipping UAVs flying in controlled airspace with some form of transponder, so that they could be seen on air traffic control and cockpit displays. Given the level of investment that would be required

24 TRAN, Evidence, 22 November 2016, 0945 (ALPA).

25 TRAN, Evidence, 6 December 2016, 1000 (Mr. Rudy Kellar, Executive Vice-President, Service Delivery, NAV Canada).

26 TRAN, Evidence, 22 November 2016, 1010 (ALPA).

to install transponders, however, the ALPA and Unmanned Systems Canada spokespersons also recommended that some form of federal assistance be provided to do so.[27] Ian Glenn of ING Robotic Aviation Inc. noted before the Committee that, since all aircraft have a responsibility to safely share the skies, all piloted aircraft should have transponders that would allow manned and unmanned aircraft to avoid each other.[28] Mr. Bernard Gervais, President and Chief Executive Officer of the Canadian Owners and Pilots Association, which represents the general aviation community, was opposed to private aircraft owners having to invest in new equipment to detect and avoid drones, [29] although it was revealed that a similar requirement will be in effect in most of the United States in 2020.[30]

UAVs can venture into or be left stranded in restricted areas when UAV operators lose control of their equipment or when UAV batteries run out. The Committee learned that it is possible to program a UAV to restrict its operation at defined locations and altitudes. Geofencing was recognized by some witnesses as a proven technology in use today.[31] Mr. Paul Di Benedetto, Chief Technology Officer at Drone Delivery Canada also told the Committee that computer chip manufacturers could enable a "ground stop" function on UAVs that would prevent a UAV from taking off and provide for UAVs in the air to land safely when activated.[32]

The spokesperson for Unmanned Systems Canada, which represents 500 UAV businesses, expressed concern about the impact any new equipment requirements might have on business continuity for its members.[33] This group recommends grandfathering design standards for businesses to protect their investments and business obligations.

Witnesses representing the UAV industry and airports both recommended that any design standards be performance-based.[34] They cautioned that mandating specific technological solutions could inhibit future developments.

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27 TRAN, Evidence, 24 November 2016, 0905 (Unmanned Systems Canada).

28 TRAN, Evidence, 24 November 2016, 0940 (ING Robotic Aviation Inc.).

29 TRAN, Evidence, 22 November 2016, 0945 (ALPA), 0955 (COPA); Evidence, 24 November 2016, 0850, 0905 (ING Robotic Aviation Inc.).

30 Federal Aviation Administration, *Equip ADS-B: ADS-B Airspace*.

31 TRAN, Evidence, 24 November 2016, 0925 (ING Robotic Aviation Inc.), 1040 (Paul Di Benedetto, Chief Technology Officer, Drone Delivery Canada); Evidence, 29 November 2016, 0930 (Canadian Airports Council).

32 Ibid., 1035 (Drone Delivery Canada).

33 Ibid., 0845 (Unmanned Systems Canada).

34 TRAN, Evidence, 29 November 2016, 0905 (Consumer Technology Association), 0935 (Canadian Airports Council).

To ensure the reliability and safety of UAVs in Canada, the Committee recommends:

RECOMMENDATION 16

That any future government regulatory framework requires unmanned air vehicles meet specific testing standards based upon the level of risk they may pose.

RECOMMENDATION 17

That any future government regulatory framework for unmanned air vehicles be designed with systems to prevent run-aways.

RECOMMENDATION 18

That any future government regulatory framework incorporate innovative safety and security-based technologies such as, but not limited to, the use of a BFUFly style app, geo-fencing, tracking devices and other ground blocking technologies.

RECOMMENDATION 19

That Transport Canada ensure that all unmanned air vehicles that pose a risk to the public based on size, speed or other factors have transponders.

RECOMMENDATION 20

That the committee recommend that Transport Canada take small local and regional airports or aerodromes into consideration in developing its regulations, as well as aircraft that do not have the necessary electronic equipment to detect unmanned air vehicles.

VIOLATIONS AND ENFORCEMENT

Transport Canada officials informed the Committee that law enforcement officials across Canada have noted cases of unsafe, reckless and negligent behaviour by UAV users. RCMP officials confirmed that they are experiencing increased complaints about UAVs from the public as the industry grows.

Transport Canada officials also noted that it has provided information about how to operate UAVs in a safe and respectful way by promoting public awareness of the issues online and through the media. Representatives from ALPA and the Canadian Airports Council expressed the view that more needs to be done to promote public awareness of safety issues, such as requiring information to be provided at the point of sale.[35]

35 TRAN, Evidence, 22 November 2016, 0945 (ALPA); Evidence, 29 November 2016, 0920 (Canadian Airports Council).

It appears that only Transport Canada and the RCMP are authorized to enforce the UAV-related violations under the *Aeronautics Act.* Transport Canada officials indicated to the Committee that the department must work with other levels of government in Canada to enforce the federal UAV regulations. Representatives from NAV Canada and the ALPA expressed support for delegating authority to local provincial and municipal police forces in order to assist in enforcing UAV-related rules. For these reasons, the Committee recommends:

RECOMMENDATION 21

That Transport Canada engage in ongoing dialogue with the Provinces, Territories, and municipalities on unmanned air vehicles, in order to: identify and resolve any conflicts between jurisdictional regulations, to streamline the regulatory process, and to discuss any future safety, security, and regulatory concerns that may result from the ongoing evolution of the industry.

PRIVACY INTRUSIONS AND CRIMINAL ACTS BY OPERATORS OF UNMANNED AIR VEHICLE USERS

Some members of the Committee are particularly concerned about UAVs being used to invade privacy and for criminal purposes.

Certain of the witnesses heard by the Committee were of the view that the impact of UAVs on privacy is not founded in reality, given the low resolution of cameras equipped on recreational UAVs typically used.[36] Furthermore, Mr. David Fraser, a privacy lawyer, advised the Committee that Canadian laws of general application concerning privacy, trespassing and nuisance apply to UAV users. [37] Mr. Kerry Moher, Vice-President at Fresh Air Educators, a company that offers online education in the outdoor recreation field, implied that the education offered to UAV users could help address potential privacy issues.[38]

Witnesses who commented on counter-measures that could prevent a public safety incident caused by a UAV generally conveyed that the technology is advancing rapidly. For example, a representative of the RCMP indicated that they are working extensively on UAV counter-measures to protect public safety with their partners and the industry. It was noted, however, that there is no single counter-measure system that can detect, track and mitigate a UAV at this time.[39] The representative from ING Robotic Aviation Inc. proposed that law enforcement in Canada should support UAV counter-measures with research and development.[40]

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36 TRAN, Evidence, 22 November 2016, 1025 (Fraser); Evidence, 24 November 2016, 0930 (Unmanned Systems Canada).

37 TRAN, Evidence, 22 November 2016, 1025 (Fraser).

38 TRAN, Evidence, 24 November 2016, 1035 (Fresh Air Educators).

39 TRAN, Evidence, 29 November 2016, 1005, (Dave Domoney, Royal Canadian Mounted Police).

40 TRAN, Evidence, 24 November 2016, 0930 (ING Robotic Aviation Inc.).

When Transport Canada officials appeared before the Committee, they expressed an intention to work with other federal departments and agencies to develop a UAV strategy that considers privacy and public safety considerations.

Given these concerns, the Committee recommends:

RECOMMENDATION 22

That Transport Canada and security agencies work in collaboration with one another on ongoing and future research and development of unmanned air vehicle interdiction systems.

RECOMMENDATION 23

That the Committee communicate with the Public Safety and National Security Committee, and the Justice and Human Rights Committee, to consider utilizing their respective expertise to examine any possible privacy, public safety, and/or national security implications of unmanned air vehicles and unmanned air vehicle technologies resulting from the potential criminal use of this emerging and expanding industry.

RECOMMENDATION 24

That the federal government ensure that Canadian privacy legislation adequately protects Canadians from the recreational and commercial use of unmanned air vehicles.

LIST OF RECOMMENDATIONS

APPENDIX A
LIST OF WITNESSES

Organizations and Individuals	Date	Meeting
As an individual	2016/11/22	34
David Fraser, Partner, McInnes Cooper		
Air Line Pilots Association International		
Dan Adamus, President, Canada Board		
Canadian Owners and Pilots Association		
Bernard Gervais, President and Chief Executive Officer		
Drone Delivery Canada	2016/11/24	35
Tony Di Benedetto, Chief Executive Officer		
Paul Di Benedetto, Chief Technology Officer		
EXO Tactik Air Support		
Stéphane Bouvier, President		
Anne-Sophie Riopel-Bouvier, Vice-President, Operations		
Fresh Air Educators		
Kerry Moher, Vice-President, Business Development		
ING Robotic Aviation Inc.		
Ian Glenn, Chief Executive Officer		
UAS Centre of Excellence		
Marc Moffatt, Director General		
Unmanned Systems Canada		
Mark Aruja, Chairman of the Board		
Canadian Airports Council	2016/11/29	36
Stephen Wilcox, Airport Manager, Oshawa Executive Airport		
Consumer Technology Association		
Doug Johnson, Vice-President, Technology Policy		
Department of Transport		
Laureen Kinney, Assistant Deputy Minister, Safety and Security		
Aaron McCrorie, Director General, Civil Aviation		
Mark Wuennenberg, General Flight Standards Inspector		

Organizations and Individuals	Date	Meeting
Royal Canadian Mounted Police	2016/11/29	36
Byron Boucher, Assistant Commissioner, Contract and Aboriginal Policing		
David Domoney, Staff Sergeant, National Traffic Services		
As individuals	2016/12/06	38
Kamran Behdinan, Professor		
Hugh Liu, Professor		
NAV Canada		
Brian Guimond, Manager, Military Operations and Unmanned Aircraft Systems		
Rudy Kellar, Executive Vice-President, Service Delivery		

APPENDIX B
LIST OF BRIEFS

Organizations and Individuals

City of Vaughan

CUAVA

Department of Transport

ING Robotic Aviation Inc.

Unmanned Systems Canada

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant Minutes of Proceedings (Meetings Nos. 34, 35, 36, 37, 38, 39, 40, 41 and 44) is tabled.

Respectfully submitted,

Hon. Judy A. Sgro
Chair

NDP supplementary opinion

At the beginning of our study on drones, we were still far from imagining the complexity of the challenge posed by the recreational and commercial use of drones and their regulation. While we support several of the Committee's recommendations, we would like to emphasize that some of them raise more questions than they provide clear guidance.

This is particularly the case with Recommendation 4, where no witnesses in the paragraph preceding the quote are directly associated with the idea that commercial operators work together in order to maintain productive dialogue with individuals who work in The experimental modification of unmanned aerial vehicles.

At this time, the Committee has not been able to identify categories of drones that should be subject to specific regulations.

Recommendation 19, for example, would require all types of drones, commercial and recreational, to be equipped with a transponder, which was not necessarily demonstrated by the study.

In particular, we propose that the Committee invite the following witnesses to discuss other aspects of the regulation of drones that the interim report was unable to address:

- The Minister of Transport to further disclose his vision to the Committee.
- The Privacy Commissioner of Canada to review the possible impacts of the use of drones on the protection of privacy and personal data.
- Trade unions so that workers' representatives can share their concerns about the safety of their members working in the airline industry
- Representatives from the economic sectors where drones will play a key role in their activities.
- Provincial and municipal representatives to disclose to the Committee their safety concerns

Finally, to the extent that the Committee's report indicates that this is an interim report, we reserve our final conclusion to the study on drones when the Committee finalizes its study on the subject.