

9 March 2016

INVESTING IN THE GLOBAL COMPETITIVENESS OF CANADA'S UNMANNED  
AERIAL SYSTEMS SECTOR

Canada, with its vast geography, low population density, abundance of resources and challenging environment created the conditions to invent bush flying and the related technologies and know-how. Today, aviation in remote locations is a hallmark of Canadian aviation industry around the world. The next big step is to do some of these most challenging tasks with Unmanned Aerial Systems (UAS), where we can once again lead the world in innovation in operating in remote areas.

As Canada's national non-profit association representing public and private innovation in unmanned vehicle systems, Unmanned Systems Canada has spearheaded initiatives which have resulted in the dramatic growth of the UAS industry in Canada. However, we are now at an impasse. With modest, but immediate government action, this impasse can and will be bridged with substantive impacts on the economy, and renewed innovation with novel applications of UAS technology.

The growth of the Canadian UAS sector in Canada has benefited from our close collaborative efforts over many years of work with Transport Canada. The "UAV Program Design Working Group" co-chaired by Transport Canada and Unmanned Systems Canada is an industry and government stakeholder committee formed in 2010, tasked with developing a suite of proposed regulations enabling routine unmanned aircraft operations (aka "file and fly") in Canada. The regulations development process was divided into four distinct phases as a function of risk:

1. UAS under 25kg., operating **within visual line of sight** of the pilot;
2. UAS under 25kg., operating **beyond visual line of sight** of the pilot;
3. UAS between 25 and 150kg., operating beyond visual line of sight; and
4. UAS over 150kg operating beyond visual line of sight.

Phase 1 was completed in 2012 and has resulted in a Notice of Proposed Amendment which is expected to become law in 2017. However, these regulations will only address UAS operations within Visual Line of Sight of the operator. Clearly, monitoring the integrity of Canadian pipelines and hydro lines, measuring the bulk value of our forests, environmental monitoring of the Arctic, are but some of the applications where

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operations must be conducted **Beyond Visual Line of Sight (BVLOS)**. The Phase 2 working group report on recommended changes to Canadian Aviation Regulations to enable BVLOS operations has been completed. It now requires the resources for implementation.

Today, UAS operations are authorized by Transport Canada with the issuance of a Special Flight Operations Certificate (SFOC). Whereas virtually no SFOCs were issued when we started working in earnest with Transport Canada, by 2012 that number had grown to 345, then 945 in 2013 and 1,672 in 2014: we expect that the 2015 tally will follow that growth curve. These SFOCs are being achieved by industry and the regulator working to the results of the Phase 1 work, while awaiting formalization in law. What this means is, that the regulatory efforts to date, have already realized the remarkable economic growth which Unmanned Systems Canada had projected! Every day, somewhere in Canada UAS are:

- Rapidly providing police with high quality airborne data for accident scene reconstruction, significantly reducing the time for reopening our transportation arteries;
- Undertaking monitoring of structures such as industrial flare stacks and cell phone towers, improving safety while lowering costs;
- Increasing crop yields while reducing the use of pesticides and herbicides and growing the discipline of precision agriculture;
- Used for environmental monitoring ranging from non-intrusive surveillance of bird sanctuaries to industrial facilities in our energy sector;
- Used on film sets to improve the quality of their product, while enhancing the competitiveness of our film industry; and
- Site planning, project monitoring, aggregate pit measurements and a host of other applications in the construction industry.

In addition, at least 20 Canadian academic institutions and companies now offer training programs on UAS systems; there have been major steps taken by the insurance industry to address risk management, and so much more.

While our industry has grown exponentially, there has been little or no growth in the critical Government staff required to support this federally regulated economic sector. All of the existing federal government personnel resources assigned to the UAS sector will be occupied for at least the next 18 months on the review and approval of the new regulations noted above. The direct impact is that the draft BVLOS regulatory recommendations and standards resulting from the completion of the second phase of the working group with TC continue to await staff availability for formal staffing and approval within the Department. The recommendations and standards proposed in this phase are critical to the future of our industry and will truly release the economic potential. Some technology development remains to meet the “sense and avoid” capability to fully permit BVLOS operations; however publishing the standards recommended by the working group will provide industry and R&D organizations with the required design objectives. In addition, because BVLOS technology and operations

experience is exportable for mining survey, environmental monitoring and a host of other applications, we risk losing a world-leading opportunity.

Therefore, we propose that:

- The federal government immediately increase the staffing levels of experts at Transport Canada with a mandate to proceed without delay to review, approve and implement the BVLOS guidelines;
- That the federal government identify specific funding through Innovation, Science and Economic Development and the National Research Council to enable BVLOS operations by working with and funding Canadian companies to test, and if needed close technology gaps with improved 'sense and avoid' systems;
- Financial incentives be created for small aircraft operators and equipment manufacturers to install Automatic Dependent Surveillance – Broadcast (ADS-B) equipment into all aircraft. ADS-B promises to greatly improve aviation safety, and in particular the safe integration of UAS into our airspace as an existing aid in sense and avoid technology; and
- Ensure that interdepartmental (e.g. Statistics Canada, Global Affairs, ISED, TC) resources are assigned to a collaborative effort to measure this new economic sector in order to support evidence-based public policy making and investment by the private sector. Policy must also encourage growth in this new economic sector through targeted Industrial Technology Benefits (ITB) requirements on any federal government UAS procurements.

Canadian industry has worked diligently and persistently with the federal government to create hundreds of new companies and commercial initiatives and the creation of a Canadian UAS industry in only a few years. However, we risk being rapidly overtaken by our competitors without commensurate support from the federal government. Other jurisdictions, notably the UK, US and European governments and regulatory bodies are investing heavily and working closely with industry to test how technologies can facilitate safe BVLOS operations in preparation for rulemaking. With the timely implementation of our modest recommendations, we can ensure that the economic outcomes of Canadian innovation can continue apace, and, we can keep Canadian companies in a position of world leadership.

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