HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Standing Committee on Transport, Infrastructure and Communities

TRAN • NUMBER 035 • 1st SESSION • 42nd PARLIAMENT

EVIDENCE

Thursday, November 24, 2016

Chair

The Honourable Judy A. Sgro

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● (0845)

[*English*]

The Chair (Hon. Judy A. Sgro (Humber River—Black Creek, Lib.)): I call the meeting to order.

Pursuant to Standing Order 108(2), the Standing Committee on Transport, Infrastructure and Communities, meeting number 35, we are studying unmanned aerial vehicle regulations.

Witnesses, welcome to our committee. I'm glad to see that everybody's here.

A voice: Not quite. EXO Tactik is caught in traffic.

The Chair: One set of witnesses is caught in traffic. I guess they're not using a drone, or they would have been here on time.

We will start with who we have right now. We have Ian Glenn, chief executive officer for ING Robotic Aviation Inc., and Mark Aruja, chairman of the board of Unmanned Systems Canada.

Gentlemen, welcome. Thank you for providing us with some important comments on a fledgling industry in this country and around the world.

Mr. Aruja, you have the floor.

Mr. Mark Aruja (Chairman of the Board, Unmanned Systems Canada): Madam Chair, I wish to extend my appreciation to the committee for the invitation to appear as a witness.

Unmanned Systems Canada is a national not-for-profit association established in 2003. With 500 members, we represent the Canadian unmanned systems community. We have been proactively engaged with Transport Canada since 2006, a decade ago, regarding the development of UAV regulations. We have co-chaired the UAV systems program design working group with Transport Canada since its inception in 2010, which has resulted in the guidance material used today by industry and regulators.

The current visual line of sight practices, honed over five years of commercial operations, are the basis of what is being proposed as amended regulations with *Canada Gazette* part I notification expected by mid-2017.

From an industry association's perspective, I will not address the regulations themselves, but rather how they will be implemented. Our critical concern is business continuity.

Under the current regulations, UAV operations are approved by means of a special flight operations certificate, SFOC, whereby an operator in their application for that SFOC describes how the risks of their operation are mitigated. A decade ago, the issue was the lack of guidance to industry and the regulator on how an application should be made by industry for an SFOC, how the regulator might approve an application, and the business risk associated with the lack of an approval process.

Since then, the working group results, our association's visual line of sight best practices, improved Transport Canada staff instructions, and increasingly reliable and affordable equipment, coupled with major business opportunities, have resulted in the dramatic growth of SFOC approvals.

Let's talk about business continuity. In 2011 about 100 SFOCs were approved by Transport Canada. Last year that number was 2,480, and we've passed the 4,000 mark as of this year. There are now 1,000 UAS-related businesses in Canada. This is why business continuity is at the forefront of our concerns. These companies invest in intellectual capital, equipment, training, marketing and sales to meet the requirements of the regulator and to develop commercially viable businesses.

UAS technology applied in areas as diverse as the film industry, construction, and precision agriculture have resulted in better, safer, and cheaper business practices. These results are reflected in an increase in investment dollars flowing to the industry. Regulatory certainty is an important criterion for investors to determine the risk to their investment. Therefore, we are very pleased that Canada is moving ahead toward a regulatory structure.

The business continuity risk we're discussing here has two aspects. One is the transition to the regulations and the second one is the capacity risk at Transport Canada. The two are linked.

With regard to the transition, the regulations are going to address three fundamental areas and accords with how the regulations are structured: knowledge requirements, operating procedures, and equipment.

Companies have invested heavily to build their businesses, and therefore it is critical to their business continuity that the transition to the proposed regulations take into account a business means test reflected in an enabling transition plan. Companies with approved SFOCs should see no change in their operations other than minor adjustments. However, we have concerns, such as how UAV equipment requirements will be defined. Part of the solution will be grandfathering, which recognizes investments made, ongoing business obligations, and proven expertise.

Let's turn to capacity risk at Transport Canada. You may be surprised to learn that there are only two people in the department who are dedicated to UAS regulations. This situation poses the most significant risk to Canadian industry. Not only is the transition to the proposed regulations at risk, but there is also a growing backlog of issues critical to the future of the industry.

We are one of the most innovative industries in Canada, so visioning is part of our DNA. In October our association published "Beyond Visual Line of Sight Best Practices" to enable the industry to take the next critical step. The business case for BVLOS operations needs to be built, just as we have done with visual line of sight operations to capture the immense economic potential.

A recent PricewaterhouseCoopers report estimated that the global accessible market for UAS operations is $127 billion. In sectors ranging from mining to forestry, environmental, pipeline and railway monitoring, to precision agriculture, we have the geography and the expertise to take our experience to the global market.

● (0850)

The lack of capacity at Transport Canada has directly impacted Canadian businesses by a lack of priority on BVLOS operations which is the Holy Grail of the industry in which we're in a global competition.

Canada is a world leader in developing the UAS industry. Unfortunately, failing comparable investment by other nations such as the U.S., Australia, and the various countries in Europe, we are now falling behind. Therefore, we need accelerated government action and investment to ensure that our industry continues to innovate and flourish. We encourage government to examine the broad economic and social implications of this industry, and how other departments can provide resources beyond just those implicated in a regulatory development.

In summary, we are pleased UAS regulations for visual line of sight are being proposed. However, we need a thoughtful implementation strategy to enable Canadians to establish a global market share with this technology, with accelerated government investment and action that is responsive to market realities.

Thank you.

The Chair: Thank you very much.

Mr. Glenn.

Mr. Ian Glenn (Chief Executive Officer, ING Robotic Aviation Inc,): Good morning. I'm Ian Glenn, CEO of ING Robotic Aviation.

This is my 20th year in the UAV business. In 1996, the Canadian Army entrusted me with their UAV program, and I've been engaged with UAVs since then. I've also been engaged with Transport Canada since then. This is the year when I'm looking for Transport Canada to give me the gold watch.

We have not moved forward far enough fast enough. Mark's done a great job of illustrating where we stand today. Where we stand today is, we have failed to keep up with the rest of the world. We were leading, and due to resourcing and focus of Transport Canada on this sector, we have failed to the point where companies are now not looking to Canada but to the U.S. to move their businesses.

That said, there is a way forward for Canada in particular. The first slide I show you is really what the trillion-dollar question is here. It's not about the unmanned aircraft industry. It's about Canada's inability to safely and effectively move product to tidewater. This is a place where robotic aircraft have a great place to play where we can demonstrate to the world that we are safe and effective in reducing greenhouse gases in moving our products to the world.

Most of these products actually transition through first nations lands. I'm one of the first to have taught first nations how to safely fly UAVs. There's a great opportunity in Canada for us to move forward.

On the second slide, which is the one with the picture of the plane and the UAV, there is a technology available today that will address part, if not all, of the challenges faced by Transport Canada and the country. That's a little technology called a transponder, and they are tiny little devices today. Manned aviation uses this type of technology all the time. This is ICAO-approved technology for big planes. We find in 2016 that this is now small and useable technology that every drone could be equipped with.

What does that mean to us? If we think of last week, we had Porter thinking they saw a drone—probably a weather balloon—just because of where it was, but they didn't know. Our airline pilots are spooked by the whole drone phenomenon. There are more unmanned aircraft flying in Canada today than manned aircraft. By Christmas this year, there will be two and a half million drones flying in North America. Remember, we only have 33,000 registered aircraft in Canada. There's a technology that will allow us to work with this. I call this little device, of which there are many manufacturers, the seat belt of 2016. How do we effectively let everyone know where drones are? That's the point I would make.

I've been on every CARAC working committee for 20 years. There are three things we need to do as a country to move this forward rapidly.

Number one, if you're going to fly beyond visual line of sight—and this is where the money is; this is the reason we come to work—we have a thing called a compliant operator. That means you look, smell, and taste like an aviation company, and so you have to have all the safety management processes, and you have all of those things you have to do. If you just go to Best Buy and pick up a drone, you have a lot to learn, and that's important.

Number two, we need compliance systems. We have developed all of those regulations through the CARAC process that basically say, “You look and work like an aviation asset, an aircraft.” That's important.

● (0855)

Number three, we need to tell each other where we are. A “no drones” sign on the fence at the airport isn't cutting it. You know, the education program.... You can tweet all day long; it doesn't really cut it. We need to use a bit of technology and enforce it, not just for unmanned aviation, but for manned aviation as well, and the expense is not high.

The fourth slide speaks to a thought I have about how we can do this and keep everybody happy, because we're Canadians. Most of the work that we want to do in Canada is not over the GTA or downtown Ottawa; it's out over the woods.

I have a team up past Cochrane, Timmins, flying magnetometer surveys for De Beers today, in the snow. That's where we need to be flying. I could be much more cost-effective, much more efficient, if I were able to operate beyond visual line of sight. If every aircraft in Canada had this technology, that would be a great risk reduction exercise.

The origins of ADS-B were that, in 1999, Alaska adopted it. They immediately saw a 78% decrease in man-on-man accidents. It's a great technology.

Finally, we have this ability today, technologically, to move forward. I have certainly made the suggestion that for our manned aviation folks who prefer not to spend money, they're going to buy it anyway. In the U.S., in two years or three years they're going to have to have this technology to fly down to Fort Lauderdale. What they could do is perhaps make it a tax credit. We're talking about a couple of thousand bucks for equipage.

Good technology recognized in the world would change the equation for Canada and all of our citizens. In particular, when we think of the great white north, wouldn't it be wonderful if our first nations, for instance, who are objecting to moving product to tidewater, had the ability to have high-tech jobs in their own communities to help us ensure that we're moving product well?

Thank you very much.

● (0900)

The Chair: Thank you very much.

I'm glad to see that you have arrived. Anne-Sophie Riopel-Bouvier, vice president, operations, welcome.

The floor is yours.

Ms. Anne-Sophie Riopel-Bouvier (Vice-President, Operations, EXO Tactik Air Support): Good morning.

Do you mind if I do my witness statement in French?

The Chair: No, of course not.

We welcome that.

[*Translation*]

Ms. Anne-Sophie Riopel-Bouvier: Thank you very much.

Good morning.

Stéphane Bouvier and I are representing Support aérien EXO Tactik this morning.

Our company was launched in February 2014 to provide air support service with drones for public safety purposes. We are operators, we pilot the aircraft to help police officers, firefighters and civil emergency responders to obtain live aerial images of the intervention sites. We therefore help them make better decisions faster, optimize their operations to save more lives, and protect those who often risk their lives to protect us.

The first months of operation were a bit more challenging, as the current process to obtain a flight certificate does not apply to emergency operations. There are many initial delays before a flight certificate can be obtained. Unfortunately, fires don't wait for Transport Canada. After doing a lot of work, we managed to get a permanent special flight operations certificate. This has been an essential support to our operations.

Last year, in 2015, we also submitted a brief to the Canadian Aviation Regulatory Advisory Council, as part of the notice of proposed amendments for unmanned aerial vehicles.

My colleague wanted to go over the history of drones. So I'll do it in his place.

It will soon be the 100th anniversary of the creation of drones. In fact, they were already active during World War I. At that time, drone operations were mainly military, which has been the case until recently. Since the 2010s, the technology has become much more accessible to consumers and the general public.

The devices come with GPS. The devices are also miniaturized, like the transponders that Mr. Glenn showed you. Everything has become smaller, much more accessible, less expensive and much easier to fly. The batteries have also become much more accessible.

In 2013, DJI launched a drone called the Phantom. We'll bring one into the room in a second. It's like the model T for cars. It is the first accessible model: it is easy to operate for consumers and the general public. It has revolutionized the world of drones. That's when the popularity of drones exploded.

Today, there are more and more drones. That's when things become more problematic, as was the case in the early days of the automobile. One day, there were too many cars and it was necessary to regulate the traffic, to install traffic lights and to introduce the seat belt.

That's the stage we are at with the drones. These devices are here to stay. Sales will not drop by next Christmas; they will continue to grow.

Thank you.

[*English*]

The Chair: Ms. Riopel-Bouvier, you referenced a report you gave to Transport Canada with some suggested regulations. Could you supply that to the clerk for the purposes of the committee?

Ms. Anne-Sophie Riopel-Bouvier: I will.

The Chair: Thank you very much.

We'll go to questioning. Mr. Berthold, for six minutes.

[*Translation*]

Mr. Luc Berthold (Mégantic—L'Érable, CPC): Thank you very much, Madam Chair.

Thank you very much to the three of you for your presentations, which have shed a lot of light on the current situation. The three submissions were very different.

In response to those three presentations, my first question is for you, Mr. Aruja.

We have just heard Mr. Glenn talk about the seat belt. In the introduction to your presentation, you talked about a transition period for the vehicles, so that the industry does not experience any kind of price shock, which would kill the momentum that is already there.

Previously, we have heard from the representatives of pilots, those other users of the sky. They all felt that transponders were absolutely essential.

What is the industry's position on the use of transponders for drones?

● (0905)

[*English*]

Mr. Mark Aruja: Thank you very much for that question.

First, we have to safely coexist in that airspace. Canada has an enviable safety record. The industry fully understands that is a core business risk we need to address.

I would conclude that what Ian has shown you in terms of that device—it's called an ADS-B transponder—is exactly the association's position that we need some form of government encouragement. It could be a tax credit. It could be some mechanism to get this adopted.

To put it very simply, it's like your cellphone. It sends out a signal, and says,"Here's who I am; here's where I am." The really sophisticated system says, "Here's where I'm going." This is now ubiquitous technology out there. That is exactly the type of technology that addresses the concerns of those who occupy the airspace, and gives us the technology we can take anywhere in the world.

[*Translation*]

Mr. Luc Berthold: I'm sort of following you. You have announced a multi-million dollar or multi-billion dollar industry. I don't see why the government would have to provide financial incentives for drone owners to install transponders. In my opinion, the first concern of anyone who wants to share the sky is to ensure that their devices are safe. So I don't see why the government should intervene.

We can have regulations, but why should the government and taxpayers pay for the industry's transponders?

[*English*]

Mr. Mark Aruja: That's a good question. That's a proposal that's out there now. There is this difficulty. As we have accelerated this industry to the point we are today, how do we make that transition business-friendly? If in the U.S. this becomes mandatory.... When Alaska adopted it, the FAA actually paid for all of those transponders, and had an 80% reduction in their accident rate.

I believe there is a role for the federal government, as the sole regulator with regard to safety in the airspace, to put incentives in place to allow those things to happen. There are incentives for the adoption of electric vehicles and many other technologies.

I think the government has a legitimate role, not to pay the freight, but to put encouragement out there, most importantly, to put those kinds of requirements out there so we can underwrite the safety of operating in that airspace. There's an urgency to doing this, and mechanisms such as financial incentives, even over a short period of time, accelerate that sense of urgency.

[*Translation*]

Mr. Luc Berthold: Mr. Glenn, is the technology now available and accessible to the extent that, tomorrow morning, companies could equip their drones with that?

[*English*]

Mr. Ian Glenn: Absolutely. Yes, the technology is available today. That's one of the reasons I brought this. This is a smaller one. I've been flying one smaller than this on my drones for the last four years. We actually flew in Calgary in the controlled airspace last week doing a job. The technology exists. That's not the issue.

[*Translation*]

Mr. Luc Berthold: Is it expensive?

[*English*]

Mr. Ian Glenn: In small quantities, it's somewhere between $1,000 and $2,000. That's the price range you're looking at. As for adoption, if you pick up any piloting magazine, like *Plane & Pilot*, you won't get four pages in before you see a big ad selling ADS-B transponders for manned aviation.

[*Translation*]

Mr. Luc Berthold: So it would be realistic for regulations to require the rapid installation of that type of transponder. It could be done. The government could act quickly and require it, especially since the equipment is available.

● (0910)

[*English*]

Mr. Ian Glenn: That's correct.

[*Translation*]

Mr. Luc Berthold: You also raised the issue of the limited number of Transport Canada employees currently assigned to drones.

Can you tell us quickly about the problems this is causing to the industry, in the current state of things?

Some hon. members: Oh, oh!

[*English*]

Mr. Ian Glenn: Mark will speak for the association. I'll speak for myself and my company.

I have had to turn away over a quarter-million dollars' worth of work in Canada because Transport Canada cannot react nor does it have the ability to react. There are five regions. Each of the regional inspectors has other jobs, so there is no single point of focus. We have two people. They're lovely folks, but there are only two of them, and that is unacceptable, as I like to say now, because there are more unmanned aircraft flying in Canada than manned aviation, and so is the department going to focus on where the quorum is, and which of them is going to work on manned aviation?

The Chair: Thank you very much, Mr. Glenn.

Mr. Aruja, you'll have to try to answer Mr. Berthold's questions amongst the other questions that are going to get thrown at you.

Mr. Iacono for six minutes.

[*Translation*]

Mr. Angelo Iacono (Alfred-Pellan, Lib.): Thank you, Madam Chair.

Thank you for coming this morning to enlighten us on this new phenomenon that cleaves the air.

My first question is for Ms. Riopel-Bouvier.

What is your overall experience with obtaining a special flight operations certificate? Do the delays in obtaining it now seem reasonable to you? How could that be improved?

Ms. Anne-Sophie Riopel-Bouvier: Our permanent certificate gives us permission to conduct emergency operations without having to reapply each time. Since we have obtained it, we have seen great improvement in our operating procedures. This has made the process much easier. Before we obtained this permanent certificate, which is valid for highly supervised and very restricted operations, the delays for us to receive our flying certificates were over one month. In addition, our operations were relatively easy to evaluate. In the last few months, this summer, the delays were easily between two to three months in Quebec for operators to receive their certificates.

As a result, a number of operators were no longer asking for a certificate and going ahead with the operation without being certified. Others lost a lot of contracts because of those major delays.

You are asking for my opinion and that of our company on what could be improved to speed up the process. It is not necessarily a matter of hiring more staff to process certificate requests faster, but rather about changing the entire process to an extent.

Right now, Transport Canada and the Canadian Aviation Regulatory Advisory Council are putting in place draft regulations that would provide for operating standards equivalent to those for automobiles or for aircraft.

You do not need to apply for a licence before you drive a car. When you are 16 years old, you take driving lessons and then you get your licence. You have rules to follow. You can drive your car in compliance with the rules of the road. If you do not follow them, you are punished. The equivalent for drones could greatly improve the process.

Mr. Angelo Iacono: So you're saying that, in your case, a certificate valid for one or two years would be more appropriate than having to apply for a certificate for each event.

Ms. Anne-Sophie Riopel-Bouvier: Absolutely.

Mr. Angelo Iacono: For recreational drone users, should the same reasoning apply or should there be other conclusions?

Ms. Anne-Sophie Riopel-Bouvier: The use of drones for recreational purposes should be regulated as soon as possible. Those users represent the largest segment at this time. They are the greatest risk to the industry because they are not currently required to have a special flight operations certificate to be able to fly. It's like saying that they don't need a driver's licence to drive their car. That is a danger. In addition, they do not receive the training they need to operate their aircraft responsibly above the heads of the Canadian public.

● (0915)

Mr. Angelo Iacono: Right now, how long does it take to get that type of certificate? If there is an event, how long does it take?

Ms. Anne-Sophie Riopel-Bouvier: You must submit your flight authorization application at least 20 working days in advance. That means about a month, but the current delays are between two and three months for a certificate to be issued.

Mr. Angelo Iacono: Earlier, you said that you were helping the firefighters and the police with their calls. How can you do the work if you do not have a certificate? What are you doing now?

Ms. Anne-Sophie Riopel-Bouvier: With the help of our police and firefighter clients, we were able to obtain permanent certificates. That allows us to do any emergency work.

In addition, we had to develop very important safety procedures to ensure that our operations fit into the Canadian sky properly, above the people, and to ensure that everything was safe.

Mr. Angelo Iacono: Thank you.

What do you think are the main drone-related dangers and issues that have not yet been mentioned this morning?

Ms. Anne-Sophie Riopel-Bouvier: Most of the devices on the market, including the Phantom I mentioned, still weigh several kilograms. In addition, there are no safety features for those devices. For example, the device has only four motors. Drone motors are sort of like light bulbs: they can burn out very easily. Well, if you lose a motor, it's over, the device falls straight to the ground.

There have been many cases in which control of the devices was lost, which has resulted in many injuries all over the world. There was a case this fall in Beloeil, Quebec. There are still issues. The woman who was injured by the device had to be hospitalized and she is now suing the operator of the drone.

In addition, it is increasingly easy to fly drones. Less and less knowledge or attention is needed to fly those vehicles. They cost less, so people are taking more risks operating them. In the end, they take them out of the box, they push the power button, they start the motor and they fly the aircraft willy-nilly. They do not pay attention.

There are other risks, such as the batteries in these devices. The lithium polymer batteries are the same as the ones for the Galaxy Note 7 phones, which are now banned on planes, but they are bigger.

[*English*]

The Chair: Thank you very much.

Mr. Aubin.

[*Translation*]

Mr. Robert Aubin (Trois-Rivières, NDP): Thank you, Madam Chair.

Distinguished guests, thank you for being with us this morning.

I will continue to talk about safety, because that's one of the things I wonder about, being a neophyte to this whole industry.

We heard from representatives of pilots who have expressed major concerns.

Mr. Glenn, I'd like to come back to this picture, because it stops exactly where my question begins. If each drone was equipped with the transponder you are proposing, who would be doing what when the two flying objects met? Someone who is not really familiar with the industry could assume that the pilot who is flying the aircraft in the visual line of sight may react more easily. However, if you are controlling a drone remotely and you don't see what is happening, who has to do what in that kind of situation?

[*English*]

Mr. Ian Glenn: The transponder pops up on your screen. Both the pilot and the pilot in command of the unmanned aircraft see each other at ranges greater than 10 kilometres. They both have the same responsibilities to avoid each other. It's like laws of the sea: you always go right. They're the same rules in the sky.

A pilot in command is a pilot in command whether you have a toy you buy at Best Buy or you're the 747 pilot. You have the same responsibilities, and you need to have the same knowledge set. When you see another aircraft in the sky, it's your responsibility to avoid.

We say all unmanned aircraft avoid all manned aircraft, which is true, but both have the responsibility. The issue with the world today is, we can only make a manned aircraft so small because we put people in it, the 95 percentile person. That's why a Cessna is the size it is.

With drones, they're very small, and it's really hard to see them. Both pilots in command have the requirement to avoid each other. That's why you saw the Porter pilots over Lake Ontario take emergency action. They thought they saw something, which they did. What it was, we don't know, but they avoided that incident. The role of the transponder is to allow both pilots in command to see each other much sooner. It doesn't become a drama then. It's simply to avoid each other.

● (0920)

[*Translation*]

Mr. Robert Aubin: Clearly, I do not know the rules, but I guess the two pilots could not reflexively turn in the same direction. Otherwise, the accident is not avoided.

Is that correct?

[*English*]

Mr. Ian Glenn: Not if they avoid each other correctly.

[*Translation*]

Mr. Robert Aubin: Okay.

My next question is for Ms. Riopel-Bouvier.

In your theatres of operations, fire, for instance, must mean a number of gawkers who come to the scene. I imagine you operate visual line of sight flights, since you are very close to the scene. In a plume of smoke, however, I imagine you can also lose sight of your own drone.

Do your drones have safety features such as preventing one of the motors from stopping and the batteries from running out, or enabling the devices to connect to a second system? Do your drones have different safety features than can be purchased over the counter?

Ms. Anne-Sophie Riopel-Bouvier: Yes. We buy our vehicles from manufacturers. Then we need to add several safety features or make changes to the vehicles to make them safer.

Our most commonly used vehicle right now has eight motors. So, as you mentioned, even if a motor fails, we could ultimately complete the mission and have a normal landing. Also, the batteries are connected in parallel, in case one of the two fails. In short, we do have several safety features.

We also have a number of safety procedures. For example, it is the pilot's responsibility to keep the aircraft in line of sight, avoid the plume of smoke as much as possible and fly with the back to the wind precisely to stay out of the smoke.

You were talking about onlookers. When there are operations as a result of a fire or anything else, it does attract a lot of attention. However, there are teams of policemen, firefighters and paramedics who establish security perimeters precisely to ensure that bystanders do not come too close to the fire scene.

Mr. Robert Aubin: Should the safety features included in your devices become a standard for commercial devices sold to whomever wants to have them?

It seems to me that, in popular imagery, the drone we buy in a big-box store is the equivalent of the remote-controlled aircraft that we bought as a toy in the past, a number of years ago. I will not say how old I was. I was going to say it was when I was a teenager, but it's too far away.

Should the basic units not be equipped as well with this coupling system that increases the safety of the devices?

Ms. Anne-Sophie Riopel-Bouvier: Absolutely.

Mr. Robert Aubin: Thank you.

In your opening remarks, Mr. Glenn—

[*English*]

The Chair: A short question.

[*Translation*]

Mr. Robert Aubin: Oh no, in that case, I will not have time.

[*English*]

The Chair: You have 30 seconds.

[*Translation*]

Mr. Robert Aubin: Okay, fine.

I wanted to know whether Canada is ahead of the game in this industry or behind. Just now, in your opening remarks, we heard both statements. On one occasion, we were leaders, on another occasion, we were trailing. Where is Canada positioned in this industry?

[*English*]

Mr. Ian Glenn: In the 30 seconds we have, I think we're falling behind. The U.S. Congress has already drafted language for beyond visual line of sight. They're driven by Google, Facebook, the triumvirate of big commercial folks, and they're moving well beyond us quickly.

The Chair: Mr. Aruja.

Mr. Mark Aruja: Just to help clarify, our position is that we were the world leaders, and we're exactly as Ian has said. The U.S. in particular, because they're close to us, but France, Australia, the investments by those governments are now pushing us into an uncomfortable position.

The Chair: Thank you.

Mr. Sikand, for six minutes.

Mr. Gagan Sikand (Mississauga—Streetsville, Lib.): Good morning. Thank you for being here.

My first question is for Ian.

I saw on your website that you sell a product called Serenity. It has eight hours of flight time, five kilograms of payload, is fully autonomous, and is portable in seven cases.

Is that available to the public?

Mr. Ian Glenn: Yes.

Mr. Gagan Sikand: My concern right off the bat is safety. That's great, but if I ostensibly purchase this and then use it for something else, you could transport narcotics and do worse things. How do we regulate that so it doesn't fall into the wrong hands?

● (0925)

Mr. Ian Glenn: I had the opportunity to address the parliamentary committee on defence of North America a while back. The reality is, with one million-plus drones flying in North America, that day is past. That ship has sailed, right? We're only talking about capability. You can order what you need from China today and just move on.

Where this plays a role is in allowing us to do things that you couldn't do. For instance, in Ontario, the Ministry of Natural Resources and Forestry asked me to look for moose footprints in the snow. Okay, with 25 square kilometres and at two centimetre resolution, drop your phone in the woods, and we'd find it. That's the kind of work that a drone does. We were selected by the World Food Programme to provide fly-over food security. That's the kind of work that a drone does. You can always find other uses for all these technologies.

Mr. Gagan Sikand: Tying that in, is there a way we can mandate that manufacturers somehow geofence these drones or their abilities to stay out of airspace, or our landmarks, or the like?

Mr. Ian Glenn: Absolutely. I think almost all of these technologies have a geofence capability. Certainly, we use geofencing in both of our products.

Mr. Gagan Sikand: Thank you.

Anne-Sophie, I remember being on a plane looking through a magazine and seeing a private recreational plane that actually had a parachute in it. Is there a way we can mandate that the larger drones have a failsafe of a parachute?

Ms. Anne-Sophie Riopel-Bouvier: Totally. The parachute technology is already available. It may need tweaking, but it could be part of the regulations to have a parachute on board.

Mr. Gagan Sikand: Mark, we were leaders, you said, but no longer. How do we get that top spot again?

Mr. Mark Aruja: I think we do that with visual line of sight with that regulation process going forward. I think there is some good material in there that will set the stage for beyond visual line of sight. We need the approval process to start to get beyond visual line of sight operations out there. Industry is poised to demonstrate that we can effectively monitor pipelines and do the kinds of things that Ian is talking about with environmental survey.

There was an article today about deteriorating ice conditions in the Arctic. All of those things are real. Once you get into the rural communities, there's a whole secondary explosion of economic potential that is available there. Beyond visual line of sight is what we need to do. U.K., France, Australia, all of those jurisdictions, including the U.S. in the last few months, are now enabling those.

Burlington Northern railroad is running these now to monitor their railway infrastructure. That's the Holy Grail. We need to move that forward, but we can't do that without resolute purpose and resources to move that forward. That's in weeks from now. We're not talking about years.

Mr. Gagan Sikand: Thank you.

The Chair: You still have two minutes.

Mr. Gagan Sikand: I'd like to pass that time to Vance Badawey.

The Chair: Go ahead, Mr. Badawey.

Mr. Vance Badawey (Niagara Centre, Lib.): Thank you, Madam Chair.

Thank you, Mr. Sikand.

I have to say that I do understand and respect as well as appreciate some of the good things the industry is going to provide society in general. It's exciting, quite frankly, but there are some challenges as well. I want to be very clear about that. Those challenges are primarily around public security and public privacy. Not only do I want to question you on that, but I also want to give you my opinion with respect to my expectations of you, as a representative of the industry—not of government; I want to be clear about that—and with that, trying to strike that balance between economy, which is what you're in the business to be and do and obviously prosper, and your responsibility with your product with respect to public safety and public privacy.

On many occasions throughout your presentations, you mentioned the expertise that you do have. With your expertise, what thoughts have you given to ensuring proactive—and I want to emphasize the word proactive. We can have all the regulations we want. We can have all the policing we want, but that's reactive. The incident has already happened. Let's talk about being proactive so the incident doesn't happen.

What thoughts have you given towards being proactive when it comes to public safety and public privacy?

● (0930)

Mr. Mark Aruja: That's a great question.

We initiated the conversations almost a decade ago with the Privacy Commissioner not only federally, but provincially. Ann Cavoukian, the Privacy Commissioner of Ontario, wrote a seminal piece called “Privacy by Design”. That was the forerunner to how you build geofencing technology in there, so that the technology doesn't allow you to do things that would impact on privacy or those kinds of issues. We engaged early and proactively, she said.

We represent the professional industry. Those are seminal issues for us, because if we don't have social licence to operate, then we'll fail our businesses. We have in our best practices that when you operate, you wear a vest that's visible that says who you are. If you're operating near someone's property, before you go and operate, you go and talk to those folks and tell them what you're going to be doing. Give them your business card if they have any concerns. That is the way the industry operates.

There is a real concern on the recreational side, for sure. The differentiation between normal aircraft and drones, quite frankly, is they have a camera on them.

You did get testimony on Tuesday from a privacy lawyer that the camera on these recreational drones has a really wide field of view. In fact, most of them have lower performance than what's in your cellphone. The reality of what you can actually do is that you can't do much. There's a perception out there and that is the social licence. To that end, we as an industry have an extremely proactive understanding that this is an issue that we have to address and we believe we've done so.

Mr. Vance Badawey: Do I have time?

The Chair: Yes. You were the next speaker so we'll roll two minutes from Mr. Sikand on to your time.

Mr. Vance Badawey: Thank you.

Again, I want to be clear, we're talking about being reactive. That's what you're suggesting with vests and lines of sight. That's all reactive, but frankly, again to be clear, I'm not concerned about that because it's after the fact. The incident has already happened.

What I'm getting at is how we can be proactive, and what technology the industry has thought about. Let's face it. The market will mature only at the rate of your technology—not government technology, but your technology—that will protect public privacy and ensure safety.

When we look at the attempt to be proactive so the incidents don't happen, how far has industry gone to ensure that, and what products may become available to ensure that public privacy as well as public safety?

Mr. Ian Glenn: I'll take a stab at this. There are two parts to this. One is operational and one is technological. You stressed the technological part. That's why I suggest this as a way forward, because any of our law enforcement folks will know exactly who, what, when, and where.

Mr. Vance Badawey: Let me just interject. That's if you're playing by the rules. Let's take a look beyond.

You're not supposed to use guns in certain ways or in certain situations, but people do, and this is no different. You're going to have situations where people aren't going to play by the rules.

You're going to have situations where incidents are going to happen, and you can have all the policing and regulations, but it has already happened.

Mr. Ian Glenn: Right.

Mr. Vance Badawey: So how do we prevent it from happening? How do we prevent the drone from being used in a situation, for example, with a great number of people, or where there's a privacy issue? How do we prevent that?

Mr. Ian Glenn: Let's switch the topic not to professional UAV operators but rather to counter drone, which is a field emerging in and of itself.

Mr. Vance Badawey: Okay, let's talk about that, because that's the thought I had.

Mr. Ian Glenn: I did 22 years in the military. I was an armoured officer. There was a whole armour...anti-armour thing. We're in that world now where law enforcement worldwide has this challenge. We have to look at the threat and calculate how we can intercept anyone who wants to use these technologies for the wrong reasons.

Mr. Vance Badawey: So there is actual technology that can be put in place whether it be at a stadium, at a public event, people's private properties, airspace, that can actually counter drones so it eliminates them from being able to enter that space.

Mr. Ian Glenn: I will say parts of that have emerged. It is an emerging field, and it's a very rapidly evolving one. It will really be up to our law enforcement folks to support that with the right research and development and technology.

Mr. Vance Badawey: No. Let me just take it a step further. It's not up to law enforcement. In my opinion, and this is just my opinion, it's up to you as the industry to ensure public safety and public privacy, and to ensure that while you're putting these on the market, you also have available on the market the ability for people and/or organizations to purchase these space-free drone devices.

● (0935)

Mr. Ian Glenn: I would offer a counter thought, which is we lost privacy eight years ago when the iPhone came out, or when every camera came out.

Privacy is about social responsibility. What we're stressing is we are like any other aviation activity. A private pilot or a guy in a helicopter can look out his window and see you—

Mr. Vance Badawey: How much time do I have, Madam Chair?

The Chair: One minute.

Mr. Vance Badawey: If I can interject, I disagree. It's your responsibility. This is a new norm for industry. This is a new norm for society. On privacy, yes, you're correct. There are methods, and I'll use that word “methods”, but I'm more concerned with security. If it's not a moral obligation, it's an economic obligation on behalf of the industry that you make those available. Not government, not passing the buck to someone else, but you as an industry will be required to ensure that public safety and public privacy based on the products you put on the market.

That's an opinion, yes, but also it's going to be up to us to ensure that public safety and public privacy are preserved.

What I'm throwing back at you folks as an industry—

Mr. Ian Glenn: Yes.

Mr. Vance Badawey: —is that solution so we don't find ourselves three, five, or 10 years down the road having to react to it then versus being proactive now. That's what I'm throwing on the table at you, and I'm challenging you to, in fact, come out with those technologies.

The Chair: Thank you very much, Mr. Badawey. Your time is up.

I have to acknowledge that we also have the president of EXO Tactik Air Support, Stéphane Bouvier, who has joined us a bit late because of traffic issues and so on.

Your colleague has handled it very well.

I have to move on to Mr. Rayes, but I acknowledge that Mr. Bouvier has brought a UAV and put it on the table so that we can look at it when we switch witnesses, if you like, or beforehand discreetly, if you prefer.

We'll start with Mr. Rayes, for six minutes.

[*Translation*]

Mr. Alain Rayes (Richmond—Arthabaska, CPC): Thank you, Madam Chair.

I saw that you had your hand up and I felt that you wanted to react to the previous comments. I have a question for you and then I will let you continue with the subject. If there are things that you want to add, I will give you the rest of my time to do so, since my colleague who had the floor before me asked essentially the same questions that I find very interesting and wanted to ask you too.

Having said that, I do not quite agree with my predecessor’s comments. I believe that the industry and government have a common responsibility to establish clear rules. I am convinced that this technology is here to stay. In any case, evolution cannot be stopped. The industry is clearly going to keep adapting. I don’t want the government to pay. Mr. Berthold emphasized that just now. The industry can do its work itself, without anyone needing to interfere in its business.

My question is about all the technologies you were talking about, like the transponder. I’d like to have your opinion about it. You can both answer first, then you can continue later.

The government has just passed legislation about rearview cameras, for the same safety reasons as it did for airbags. They will now be mandatory. The industry will adapt and will include the technology for everyone. I think that we should not even question it. All the most recent safety technologies should be included. Airbags should even be installed on all sides. Why should it just be the richest among us who can afford safety systems of that kind? They should be mandatory and the costs should be spread out through the entire system.

As a basic step, could we require companies to install those safety systems in all new drones on the market, as well as putting regulations in place that would require those who already have them to go and get those safety systems? It would automatically result in lower costs, in greater access to the new safety systems, and in a greater assurance of safety.

With other regulations, we could require users to take training in the rules of proper use, in the same spirit as driver training courses, for example.

I would first like to hear both of your opinions.

Mr. Stéphane Bouvier (President, EXO Tactik Air Support): Actually, today, we use a number of technologies to make the safety of the vehicles more reliable. One of the principles is redundancy. In aviation, redundancy as a concept is common. Passenger aircraft have up to two redundancies for each system in use.

For example, the vehicle you can see here is much larger. One of the reasons explaining its larger size is that everything inside is redundant. Redundancy is the fact that all systems are duplicated. So, if one system fails, another takes its place.

The vehicle you see here. the little Phantom 4, has no redundancy. At the moment, it has four motors. If one motor or one propeller gives out, the vehicle fails and crashes.

So redundancy is one of the characteristics of this kind of vehicle.

In terms of passive and active safety, there are parachute system that—

● (0940)

Mr. Alain Rayes: Unfortunately, I have to interrupt you. Your colleague explained all that earlier.

What I would like to know is whether, in your opinion, we could require companies to install those redundancy systems, those security systems, in these vehicles. We are not experts here, but we can imagine that it might be possible. Why not have regulations to require them to be already included in the vehicles in the same way that the government already has regulations for airbags and seatbelts, and that it intends to have for rearview cameras?

The government's role is to make legislation and it is the private sector's role to conform and to come up with technologies to make that happen if it wants products to appear on the market. Otherwise, they would be illegal, in which case, steps would be taken, of course.

Mr. Stéphane Bouvier: At the moment, Transport Canada is doing very good work in this area. It is assessing companies and their missions and it is granting flight certificates to those that prove that they have adequate safety measures for the missions they carry out.

Mr. Alain Rayes: Yes, but the department issues flight certificates to individuals or companies who want to get one.

Could we require the companies that manufacture these vehicles to instal the best safety system, either a transponder or any other redundancy system to back up other systems that might fail? We are not the experts, but there are those who could tell us which system would be best. Is thinking that such a system could be required so illogical?

Ms. Anne-Sophie Riopel-Bouvier: It is not illogical, in my opinion. It was required for airbags, as you said, and the industry came to terms with it.

As of now, I do not believe that other countries have imposed technological conditions, but I do not see why we would not take the initiative in that regard.

At the moment, the entire responsibility rests on the shoulders of the public and the operators. If all the vehicles on the market do not meet the safety criteria we are looking for, it becomes impossible for the operators to meet them. That is why we should impose some regulations on those manufacturing or selling these vehicles.

Mr. Alain Rayes: Thank you.

Mr. Glenn, Mr. Aruja, what do you think of the idea of imposing those requirements on companies?

[*English*]

Mr. Ian Glenn: I think it's absolutely necessary. I think it's essential. We went from having only a few drones to millions, certainly tens of thousands in Canada. It's past the tipping point.

We need this level of certainty about who's flying where, but it has to be both manned and unmanned for the system to work.

Mr. Mark Aruja: The short answer is yes. I think we have a framework to do that. We're concerned about how we get there from here and how we make business continuity work for everybody, but the requirement to have design standards is critical. At the smallest level, if you call it unregulated or a toy—the very small size—it applies, just like the Canadian Standards Association. Something needs to be in place.

[*Translation*]

Mr. Alain Rayes: Let me ask you a very quick question that you can answer yes or no.

To your knowledge, does any country require the manufacturers of these vehicles to meet a minimum safety standard, such as the one we are discussing at the moment? Has any country reached the point of imposing manufacturing standards, as has been done in the automotive sector for rearview cameras, for example?

Just answer yes or no, because my time is running out.

[*English*]

Mr. Mark Aruja: The short answer is no.

[*Translation*]

Mr. Alain Rayes: So if we did it, we would be leaders. I think the government really likes being a leader.

[*English*]

The Chair: That's great.

I'm going to thank the witnesses who are here. We will suspend momentarily to switch to our next panel of witnesses.

Again, we have a sample for you to look at and familiarize yourselves with. Let's take two minutes to do that while we switch the panel of witnesses.

● (0940)

(Pause)

● (0945)

The Chair: I call the meeting back to order. Could I have the witnesses please take their place at the table. Mr. Di Benedetto, Kerry Moher, and Marc Moffat, would you please take your place at the table.

For the interest of the people at the back of the room and for the committee, the folks will stay for the remainder of the meeting and be either in this room or outside to answer additional questions, if the committee or others have them.

I thank everybody for their patience.

Mr. Iacono and Mr. Aubin, we are resuming our meeting. Would everybody please take their seats or leave the room? It's your choice.

Thank you very much.

Mr. Fraser, you have six minutes for questioning.

● (0950)

Mr. Sean Fraser (Central Nova, Lib.): Is there no further witness testimony first?

The Chair: Let's do that.

I know you're so anxious to ask all these questions.

Some hon. members: Oh, oh!

Mr. Sean Fraser: That's right.

The Chair: We have a lineup of questions, so you had better be fast, not too long. They should be brief presentations, as you know.

I'll turn the floor over to Mr. Di Benedetto.

Mr. Tony Di Benedetto (Chief Executive Officer, Drone Delivery Canada): Thank you very much.

Madam Chair, members of Parliament, distinguished guests, my name is Tony Di Benedetto. I am the CEO of Drone Delivery Canada.

Let me begin by thanking all of you for the opportunity to appear before the Standing Committee on Transport, Infrastructure and Communities. We really are at the cusp of an industry that holds out so much promise. I am encouraged that the government is determined to hear from industry experts as it works to ensure that it gets things right when it comes to regulating unmanned aerial vehicles or drones.

Hardly a day goes by when we don't hear or read something about drones. Sometimes it's a story that reminds us of why it is so important to make sure we chart a responsible path forward that ensures the safety and security for all of us. In this case it was the news of a Porter flight's encounter with an object that may have been a drone about 50 kilometres out from Billy Bishop Airport.

Then there are stories that remind of us of the huge potential this technology holds out, like last week's story on the CBC that looked at how a drone outfitted with defibrillators could cut response times and increase survival rates during a heart attack. To put that into perspective, the Heart and Stroke Foundation of Canada estimates that approximately 40,000 Canadians suffer cardiac arrest each year. When the heart stops beating, the chance of survival drops 7% to 10% for every minute a defibrillator doesn't deliver a life-saving electrical shock to restart the heart.

A University of Toronto computer science engineer has determined that strategically placed drones carrying defibrillators could beat ambulances to the scene by many minutes, and in some cases cut response times in half, helping many people survive. That's just one application.

The sky is literally the limit when it comes to the various applications this technology holds out, everything from drones for agricultural use, mapping, exploration, disaster recovery, urban planning, security services, architecture, and engineering, not to mention the extent to which this technology will be a game-changer when it comes to just-in-time delivery and the management of logistics around supply chains.

As the technology and innovation advances, the list goes on and on. That's what excites us at Drone Delivery Canada.

Since 2014, we have been working with government and municipalities to explore the potential of drones in delivering a robust logistics platform. We're proud to say we were the first to market, and in a short time we have assembled some of the leading minds in this country, leading researchers and professors in aerospace studies, to develop a commercial logistics platform that can meet government and commercial needs in rural and remote parts of this country. For example, we're working with the City of Vaughan, the first city in Canada to undertake a pilot program. Together we're looking at how drones can provide these logistics services to the city.

We are also excited about the potential this technology holds out for Canada's northern communities. We are busy at work on a pilot project that is looking at these communities, and seeing how drones can provide a safe and reliable way to deliver much needed services like just-in-time medicines and medical supplies.

We're also looking at opportunities to partner with Canada's indigenous communities and employ their youth. Like a number of countries around the world, we, too, are looking at how Drone Delivery Canada can support Canada Post, in this case, around mail service in northern communities, helping to reduce costs, adding efficiencies, and taking greenhouse gas-emitting trucks off the road.

All of us in this room can see the potential. The challenge is in making sure that this industry rolls out in a way that taps into this great potential, while at the same time ensuring it is done in a way that protects all of us, while at the same time addressing the legal and ethical issues.

As industry leaders, we want to continue to be part of that process working alongside government to make sure that Canada is seen as a leader when it comes to this policy development around new and emerging technologies.

The future is here. Right now government policies and regulations are lagging behind the progress that is being made by industry. The global drone market continues to attract investments, and efforts to advance this technology are being made in leaps and bounds.

Let's join forces and work together. We can't continue to operate in a regulatory, legal and ethical vacuum. The possibilities are unlimited, but like all potential, it needs to be harnessed and regulated in a way that it is in the best interests of all us.

Thank you again for your time. I look forward to being part of the policies that will be a model for the rest of the world.

● (0955)

The Chair: Mr. Moher from Fresh Air Educators.

Mr. Kerry Moher (Vice-President, Business Development, Fresh Air Educators): Thank you, Madam Chair, and committee members for the opportunity to appear today.

As a proud Canadian and a small business owner, I'm very excited about the potential for unmanned aerial vehicles, UAVs, both in Canada and globally. I look forward to sharing my thoughts and insights on how Canadians can benefit from this technology and harness its potential for both social and economic benefit.

In a world with too many industry-specific acronyms, I'm going to use “drone” in place of “UAV” for the purpose of today's discussion.

How do we increase the confidence of the Canadian public in the safety and viability of drone operation? I ask this question because I believe we cannot realize the economic potential of drone operation if the Canadian public doesn't become more comfortable with drones, or more specifically with drone operators and their credentials.

For the past 15 years, Fresh Air Educators, a company with global headquarters in Ottawa, has been at the forefront of online education and innovation in the outdoor recreation field. Our leadership began in power boat safety courses through a very successful partnership with Transport Canada to provide the federal pleasure craft operator card program, and with the United States Coast Guard to deliver the state specific boater education card programs, both commonly referred to as a boat licence.

Building on that leadership, Fresh Air Educators has worked to bring innovations from online boating education to other outdoor activities, such as hunting and firearms, all-terrain vehicles, snowmobiles, and sailing. Establishing partnerships with dozens of federal, provincial, and state agencies to make effective, engaging online education available to their residents, Fresh Air Educators has certified more than two million outdoor enthusiasts through our 125 online courses delivered on behalf of more than 50 government agencies in Canada, the United States, and Australia.

Most recently, through our involvement with the Small UAV Coalition in Washington, D.C., we have been working with experts in the field of drones to leverage online training as a key tool for providing safety and ethics training to the millions of new recreational and commercial drone operators in North America.

It's difficult to get definitive sales data for this industry in Canada to quantify the opportunity. However, by comparison, the U.S. is expected to sell more than two million drones in 2016, the fourth year in a row in which sales have doubled. Sales are expected to reach 10 million drones by 2020, granted commercial drones are expected to provide much of that additional growth.

Major global drone manufacturers have confided that Canada is a very significant market. Given our geography, it should surprise no one in this room that drone ownership in Canada is growing at a similar rate. We need to capitalize on the economic opportunity that drones provide both to Canadian citizens and to small businesses. We must ensure that certification and training is done properly to ensure safe and ethical operation while increasing public confidence in drones.

Canada was once viewed as perhaps the most drone forward country in the world, and had a huge head start on many countries in terms of the legal ability to operate drones for commercial purposes. As such, Canadian companies have been able to grow their businesses nationally and to export their skills and expertise globally.

Moreover, Canada has been able to attract significant U.S. investment for drone testing and training, but that head start has been completely wiped out in the last several months. The Federal Aviation Administration of the United States enacted new streamlined drone regulations in 2016 that have paved the way for commercial drone operation in the United States. Canada must respond if we hope to remain relevant in this growing, international industry.

Luckily, Transport Canada has some thoughtful, well-researched updates to the current drone regulations. These updated regulations include three critical elements, namely, registration, education, and certification. Registration provides accountability, but let's not stop there. Let's ensure that registration leads to education. After you register your drone, we'll teach you how to operate it safely, legally, and ethically. Moreover, let's work with commercial operators to ensure that they have the proper training needed to secure the necessary legal certification and requisite skills to succeed in their field.

These new drone regulations present a tremendous opportunity for Canada to regain a position of leadership on this issue on a global scale. Allow me to specifically address four key ingredients in the proposed regulations where we believe the details matter most.

● (1000)

First is registration. We will increase compliance if we can protect the registrant's personal information and avoid unnecessary fees.

Second is interactive, engaging education for all operators. Most high-profile drone incidents are simply caused by a lack of education and information for safety and regulatory requirements. There is no malice. It is pure ignorance. Let's also give all operators a strong ethical foundation so they can be proper stewards for drone technology. This is also the group that will become future commercial operators. Let's pave that path.

Third is in-person testing. While the FAA's new part 107 rule is much more streamlined than the previous 333 exemption process, it is needlessly cumbersome for commercial operators to travel to one of 700 testing centres to take a knowledge test that can easily be administered online. Moreover, that in-person test costs $150, whereas online testing can be much more affordable.

Fourth is curriculum. It is very easy for this kind of curriculum to include aeronautical knowledge that is more appropriate for airline pilots than drone pilots. Let's ensure the curriculum and testing is specific to the activity, with topics and language that are relevant to the audience. Our 15-year track record with Transport Canada's office of boating safety has Fresh Air Educators well positioned to provide Canadians the online training and certification needed to ensure public confidence in drones.

I thank you for your time. I will be happy to answer any questions you may have.

The Chair: Thank you very much.

Now Mr. Moffatt from the UAS Centre of Excellence.

Welcome.

Mr. Marc Moffatt (Director General, UAS Centre of Excellence): Good morning, and thank you very much, Madam Chair and committee members. You should have my notes in a little package in front of you as to what the UAS CE is all about, but I'll present it here as well.

I'm pleased to present this morning and I would like to thank you very much for this opportunity. My name is Marc Moffat. I'm the director general of the UAS CE, located in Alma, Quebec, and co-located with 3 Wing Bagotville. I've also had the pleasure of serving with the military for 20 years in the air force.

First off, let me provide a few words on our organization and what we have accomplished to date in support of the Canadian UAS community. Established in 2011, the UAS CE, or Centre d'excellence sur les drones, has been committed to support of the UAS community and its development. The site has been supported by the City of Alma and its council.

The UAS CE is a non-profit organization whose mission is to develop a centre of expertise, services in innovation and design, applications, and UAS operation, but most specifically to support the safe integration of UAS in our Canadian airspace.

The City of Alma has the humble pretension to state that the UAS CE test site was established even before the Federal Aviation Administration created the six American sites.

The UAS CE has more recently been highlighted in the updated Quebec aerospace strategy, 2016-26. The Quebec government has agreed to invest in two specific areas. First, the UAS CE will be heading the establishment of a UAV cluster that will be mandated to provide some strategic orientation to the Quebec aerospace sector. Second, the government has agreed to invest $800,000 in infrastructure for the establishment of a pre-qualification and training site. This pre-qualification test site represents a potential investment of $2.5 million. It could then become one of its kind in North America.

Concerning operations, infrastructure, and airspace, the UAS CE's location and co-operation with 3 Wing Bagotville has made it possible to conduct, for example, medium altitude, long endurance, or MALE, UAS operations in segregated and non-segregated airspace. We have supported the operation of a 45-foot wingspan UAV, flying more than 160 kilometres from the Alma airport at altitudes over 15,000 feet.

More recently, Transport Canada has approved the establishment of eight areas of class F restricted airspace to conduct UAV operations. Most specifically, these zones are critical to the beyond visual line of sight operations. These operations represent the next critical step for UAS development in Canada.

The UAS CE is also the co-founder of the International Consortium of Aeronautical Test Sites, or ICATS. The first international organization of its kind, the consortium supports the industry by enabling the development and testing of UAVs. ICATS was created to share information between the members on operational safety, flight regulations, and when allowed to do so, actual operational experience.

The UAS CE and its approximately 20 members, which are from universities and colleges and private industry, have developed very specific and exclusive expertise. The centre has participated in multiple round table discussions, conferences, and other events related to the sector and would like to offer the following observations.

On regulation development, the proposed regulations for the UAS under 25 kilograms within line of sight profile appear to provide the appropriate framework and have been supported by the community at large. However, the timelines have continued to slip to the right and have, in my opinion, resulted in numerous illegal operations, since the SFOC process has been too slow to cope with the demand. I'm fairly certain that the community will agree on that point.

On recognition of and support for a national test site, we need hands-on participation and involvement from Transport Canada. For your information, so far, there have been two test sites established in Canada: one in Foremost, Alberta—I'm not too sure if they've been invited to speak—and ourselves. We have received Transport Canada's support in the establishment of restricted airspace, and we believe it has strong interest in participating in the development and the operation of BVLOS operations. However, to date, we have been treated as any other operators.

Some provinces, such as Alberta and Quebec, have committed time and money to present strategic orientation. There is an urgent requirement or need to provide some strategic guidance at the federal level as well. I believe it would have a positive influence on the overall development of regulations.

As for standardization across all regions, as I stated, although regulations are being adapted to provide a safe framework, there is a wide gap between regions when it comes to its application. The SFOC application process is different across all regions and this is an issue that needs to be addressed.

On awareness, Transport Canada appears to have some concern with respect to the number of incidents related to UAS. However, I strongly believe that this increased number of statistics is driven by a lack of knowledge from recreational users. I think we've talked about that in the previous segment.

● (1005)

In conclusion, I'd like to thank you very much for this opportunity. I'm looking forward to answering any questions you might have, in French as well.

The Chair: Thank you very much, Mr. Moffatt.

Mr. Fraser, you have six minutes.

Mr. Sean Fraser: Excellent. Thank you very much.

I'm thrilled that you're here. I find this fascinating. The technology's cool, and having the drone in the backdrop of my line of sight today adds to the experience.

I'm going to focus primarily on the economic benefits of developing the industry. I've had the pleasure of meeting with Drone Delivery Canada previously.

First, Mr. Moher, you mentioned that we lost the lead that we had in the past few months because of the regulatory scheme introduced in the U.S. Is the best and quickest thing we can do to move quickly to harmonize the regulatory scheme in Canada to match what's going on south of the border?

Mr. Kerry Moher: I think we'll always want to respect reciprocity, certainly with the commercial operator certification process, but we could also streamline it. There are opportunities to learn from what the FAA has done and do it better. Specifically, to that end, the FAA looked long and hard at whether or not they would do these knowledge tests in person or online. They just didn't have a track record of ever having done this type of training online, whereas Transport Canada has been doing it for years.

Certainly, we would want to harmonize and we would love to have reciprocity. A drone operator certificate in Canada or the U.S. would ideally travel, but there are ways we could do it better.

Mr. Sean Fraser: In the previous panel we heard some witnesses talk about potential government investments. Specifically, they referred to tax credits to implement safety devices.

Mr. Moffatt, you described some of the investments made in Quebec. Are there specific government investments that you think we can recommend that would help foster innovation so that we can become the world leader once again?

Mr. Marc Moffatt: Concerning initiatives, I talked about the strategy in Quebec and I talked about it also in Alberta. There's a move in both of these provinces and other provinces as well. The intent behind this strategy or this cluster that the premier has put forward is to regroup the Quebec community and get the community to talk in unison to figure out where we're going from a strategic or investment or development perspective. That's the intent for now.

Our test site has been working with universities and private industry as well on integrating the airspace. To be honest, it's brand new in Quebec, as far as looking forward to strategies is concerned, so there hasn't been any move with respect to developing any systems to date.

I've worked very closely with Aéro Montréal. They have declined the invitation—they weren't quite prepared—but I'm the voice for Aéro Montréal as well, so I'm fairly well connected with the community. If there were a move afoot, I'm pretty certain I'd be aware of it.

● (1010)

Mr. Sean Fraser: Turning to the folks who are using this in interesting applications right now, I'd like to hear from both of you your thoughts on whether there are specific investments we can be making to foster innovation in the industry and, perhaps more importantly, whether there are existing barriers to new applications.

Just by way of background, one of the opportunities I see is that a researcher at St. Francis Xavier University in my home community has developed a fairly small technology to detect gas leaks in energy infrastructure. I know that the payload on the drone sitting behind you can handle this kind of technology. I see no reason that we can't strap one onto the bottom of it and capture all the gas leaks across every piece of pipeline infrastructure in Canada.

There are probably thousands more applications that I've never thought of. Are there barriers that exist now that we could eliminate to expand the applications that could be used with UAVs?

Mr. Tony Di Benedetto: The barrier we're facing today is simply the regulatory process. We've partnered with the universities, the leading minds in Canada for UAV research—the University of Toronto and the University of Waterloo. At Waterloo, for example, they have been tagging icebergs for the government since 2012 utilizing drones. We saw this and said that we should harness this academic knowledge and bring it to fruition.

The technology exists, and the reality is that when you throw money at it, things happen very quickly. We've taken the approach of building on a managed-service platform. I'm sitting here listening to all the concerns about the fail-safes and the regulations. We've built a platform that adheres to all this. We are the operator. We assume the liability. We build our platform with safety in mind.

For us the biggest hurdle is simply regulations. If there's a way that the government can invest capital, I think it is just simply to speed it up and to just let the commercial applications come to light. It's an amazing industry.

Mr. Sean Fraser: That's great.

I'll go back to Mr. Moher. I have a little less than a minute to finish, and I want to hit on the licensing and certification process.

I think when we're dealing with large-scale commercial operations, we'd probably want somebody who can demonstrate hands-on experience. What's the most efficient way to ensure that we're getting these drones safely into the hands of people who are going to use them? Do they conduct this online test that you referred to at point of sale? Do they have to show they've obtained a licence before they purchase it?

Mr. Kerry Moher: I don't think it would be at point of sale. I think there would be a compliance opportunity. The training right now, the testing for the operator's certificate, the part 107 of the FAA is extremely rigorous. You could not take it at a Best Buy and do very well. I think we have to look at the reciprocity issue. We want our commercial operator's certificate to match that program. Even a pilot would need some fairly significant online training. I think they would do it online at their own convenience, and need to keep it with them.

Mr. Sean Fraser: That's perfect, and I think that's my time, Madam Chair.

The Chair: Thank you very much.

Mr. Berthold, you have five minutes.

[*Translation*]

Mr. Luc Berthold: Thank you, Madam Chair.

Thank you all for your very enlightening testimony.

The more we hear from witnesses during this study on drones, the more we learn about them and the more we realize that there is an extraordinary potential for the Canadian economy. Your desire to have some regulatory certainty is important. We must not develop a phobia towards this new technology, as we heard in the first meeting. We must not do with drones what was done with Uber, that is, wait until it is too late before acting and pitting industries against each other.

So thank you for your very interesting testimony.

We are getting quality witnesses and we have received a request from airport representatives to appear before us. We also raised the possibility of inviting people from the municipal world. It might be helpful to allocate an additional day to the study on drones in order to really explore the matter, and so that the committee can quickly report to the government. We must play our role as advisors with these regulations. I am making that request to all my colleagues. We are very open to the idea of adding another session.

The Di Bernadettos are both asking for regulation. At the same time, you say that your main obstacle is regulation. Can you tell me exactly what the industry needs to function properly, with a guarantee of safety? How do you explain that paradox in a few words? You are saying that regulation harms you and, at the same time, you say that you need it.

Either of you can answer.

● (1015)

[*English*]

Mr. Tony Di Benedetto: We look at this as a commercial operation. We look at how Air Canada flies and the regulatory requirements they undergo. It's all about safety. Our platform is built around safety first. We are the operator. We wish to be the operator when that time comes. We oversee a fleet of drones executing a service. Our technology, our back-end systems software integrates back to Transport Canada, NAV Canada. All these different technologies that we heard about earlier, the transponders, it's a catalyst to putting it all together to create a proper framework. Regulations are lacking today on how you immobilize this technology. The consumer world is a different beast in itself because the accountability aspect is very limited. Who's responsible: the Best Buy who sold the drone, or the individual flying it? There's a whole other level of complexity there. From our perspective, from a commercial standpoint where these applications become key economic drivers for Canada, you need to partner with the right operators who understand what it is. It's a serious business. People's lives are at risk, and you need to address that.

The Chair: Do you have any additional comments? You still have a minute and a half.

[*Translation*]

Mr. Luc Berthold: Fine.

My next question goes to Mr. Moffat. He was the visionary, because he established what now constitutes the base.

You are asking for the establishment of a centre for drone training and certification. By that, do you mean that all drone owners should be trained in Alma? If not, could recreational users do an online training course, as Mr. Moher proposed?

Mr. Marc Moffatt: Training involves a number of aspects, depending on whether the use is recreational or professional. The prequalification centre, where the infrastructure is, focuses on professional use. We want to build a little village to validate systems. The RCMP, the Sûreté du Québec and the Canadian Coast Guard are all currently making acquisitions, but those organizations always have to deal with the vendors. So we want to propose systems. We are taking steps so that we can work with the National Research Council Canada to test those systems in an impartial manner and integrate them into Canadian airspace.

I can give you a very simple example. We want to reproduce what exists in Blainville, just north of Montreal. Transport Canada has a centre that tests all motor vehicles in Canada. Our interest is in developing our facilities to test systems. In Blainville, they do everything that involves motor vehicles; we want to do everything that involves drones.

[*English*]

The Chair: Thank you very much, Mr. Berthold. Your time is up now.

Monsieur Aubin.

[*Translation*]

Mr. Robert Aubin: Thank you, Madam Chair.

Distinguished guests, my thanks to you for joining us and for upgrading my knowledge, which, I confess, was somewhat limited. That knowledge comes to me via the pictures you often see on Facebook. They are truly magnificent in terms of promoting tourism, but a little disastrous when you see drones crashing to earth.

I would like to understand how airspace is shared. We know that, as soon as a conventional aircraft takes off, its route is already set. We know exactly where it will go and all risks of collision are eliminated. However, I get the impression that drones do not have to follow rules like that. Perhaps that is the wrong impression. It may just be that recreational use is not subject to those rules whereas professional uses are.

Could one of you enlighten me as to how airspace is shared among drones and aircraft?

● (1020)

Mr. Marc Moffatt: In the short term, restricted zones are established around the airport in Alma. These are closed so that systems and procedures can be developed. Drones will have to find a way to share the airspace; it is not up to aircraft to get out of their way. So our drones have to be properly equipped. We provide the spaces in which to develop the integrated systems.

In the short term, we operate under special flight operations certificates. That does not sound very special, but once a company has a certificate, it can operate within a very defined perimeter approved by Transport Canada.

In the future, we will also be looking to allow flight beyond visual line of sight. This would mean deploying systems all through Canadian airspace and equipping drones. There are vast areas in Canada, whether for pipelines, forestry or mining. Those drones have to be equipped. Flight beyond visual line of sight would be a real advance.

Mr. Robert Aubin: As I understand it, your proposal would sit relatively well with companies operating drones professionally, but not with all the recreational pilots buying vehicles that are less safe. But most incidents happen when the use is recreational, not professional. Would that be regulated by your centre or not?

Mr. Marc Moffatt: Not necessarily, because the regulations for recreational use and professional use are not exactly the same. I am not talking about little systems like DJI's Inspire drone. We see a little more flexibility with recreational use. However, the people using the systems are not sufficiently aware of the dangers and that is where the short-term problem lies. Providing training online, as has been proposed, is an excellent idea. We have to work at educating people. That kind of vehicle would typically be operating within sight.

Mr. Robert Aubin: Mr. Moher, you talk about education a lot and that appeals to me.

[*English*]

The Chair: Make it a short question, please.

[*Translation*]

Mr. Robert Aubin: How will online training be able to reach the customers, given that they are being told that they will know how to operate the vehicle in five minutes and given that they think they are competent even though they are not?

[*English*]

Mr. Kerry Moher: I think one of the things that we would love to be able to do is give people a great foundation. When we implemented the pleasure craft operator card program with Transport Canada back in the mid to late 1990s, there were a lot of people who had very little experience operating boats and plenty who had many years of experience.

In fact, we still get a lot of very experienced operators going through the program initially kicking and screaming, saying there can't possibly be something new that they could learn from this training program, and ultimately coming out at the other end feeling much better about not only their own skill set but certainly that of those around them.

We're trying to give a foundation to the general public so that when you see even a recreational drone operator, as a Canadian citizen you'll know that they have a base level of training. When I take my drone into the local high school and to a local park, people come out of the woodwork. There's just a lot of misconceptions. It's unclear what, if any, training I may have.

The Chair: Thank you very much.

We move now to Ms. Block.

No? Okay.

Mr. Berthold.

Mr. Luc Berthold: No problem.

[*Translation*]

Thank you very much, Madam Chair.

I will continue along the same lines.

We have all tried to fly one of those cheap little drones that you can buy in stores, at least those of us with children have. We have all flown them into walls and, basically, crashed the darned thing, despite all the protection systems. Those are the drones that Canadians are currently familiar with, I feel.

The potential for drones to deliver parcels to people's doors clearly raises safety issues. I will come back to that. At that point, municipal bylaws are an issue too.

A number of people have a stake in the commercial use of drones. Will they fly in the evening, at night, in the morning, for example? People are seriously afraid of drones being used.

We have not talked about this a lot, but we have to give some thought to the acceptability of drones, especially commercial drones, as opposed to the drones we use at home like I do; the ones we try to fly and end up smashing a flower pot or some similar object, as I mentioned.

Where are we with commercial use? Can either of the Mr. Di Benedettos tell us whether your company has dealt with authorities other than Transport Canada?

● (1025)

[*English*]

Mr. Tony Di Benedetto: We've been speaking to a variety of different government bodies, federal, provincial, and municipal. One of our partners is the City of Vaughan. They're the first city in Canada and I believe North America to be looking at executing a drone pilot program as part of their smart city initiative.

We looked at this. There's this huge stigma. You have to listen to all the different stakeholders, including the residents and all levels of government. Our approach is let us learn to crawl together. Forget about walking. Let's learn how to crawl. Then we walk and then we run. But let us start in the backyard. Let us start in Canada's north where there are wide open spaces, where we're far away from people, and there are a lot of trees and there's an immediate impact.

[*Translation*]

Mr. Luc Berthold: Let me stop you there.

Previous witnesses have told us that Canada is beginning to fall behind.

Are countries that have no northern regions going to wait until we have conducted tests in the north before starting a drone industry?

That is what concerns me. We feel that things are coming to a boil at the moment and I certainly do not want that economic boom to pass Canada by and for us to be last to profit from it. We can talk about the north, but it is also a challenge for municipalities to sit everyone down at the same table and come up with fair regulations.

[*English*]

Mr. Tony Di Benedetto: Correct. Globally, it's an exploding space. You have countries such as Australia, Ukraine, the U.K. The FAA in the U.S.A. issued their first licence approximately a month ago.

Everyone's treading very cautiously in this paradigm shift that is happening in our skies. The sensible approach is to start slowly and gradually learn, involve all stakeholders in this process, and then move it closer over time. This is the way we see the world working from a commercial perspective.

We're tweaking. We're testing on a daily basis with our researchers and our university partners. Every day we're learning something new. By starting in the backyard, we'll bring Canada to the forefront.

We'll make this country become a leader in this space, and then everyone will start adopting this. That's the right way of doing it. From a commercial perspective, that makes a lot of sense.

[*Translation*]

Mr. Luc Berthold: Mr. Moffat, what is your opinion about that?

Mr. Marc Moffatt: There are ways to include drones. Take France as an example, where they have beyond visual line of sight flying. Their airspace is structured differently. The country is in charge of everything 1,000 feet and below. Above 1,000 feet, Europe is in charge and things work differently. It is a risk management issue. France has taken the measures it needs to fly beyond visual line of sight.

For example, France has a major problem with copper being stolen from the railway systems of their high-speed trains. First, they used helicopters to try and find the thieves. They ended up using a drone, which makes almost no noise and which has a range of 10 kilometres. A drone weighs two kilograms or less. Risk management in the airspace is working very well. Those are concrete examples.

Mr. Luc Berthold: So they started outside urban areas, where drone use is less visible. That allowed them to practice and become proficient.

Mr. Marc Moffatt: Yes.

I would like to finish my example. We must not think about drones as we see them today. Twenty or 30 years ago, who would have thought that we would have a computer, a telephone and a camera in our pockets? An entire infrastructure has developed around telephone use.

I believe in drones. I believe that drones will deliver pizzas too, but it won't happen tomorrow. That is why we are here to talk about it and to put regulations in place. It is a matter of time.

● (1030)

[*English*]

The Chair: Thank you very much, Mr. Moffatt.

Mr. Hardie.

Mr. Ken Hardie (Fleetwood—Port Kells, Lib.): This is fascinating. I've had a chance to chat with some of you. We've received a couple of suggestions that we don't lapse into techno panic, and I don't think there's any need for that.

I see some great opportunities, especially in the North, to serve the remote communities, to drop in needed supplies, etc. There are boundless opportunities here, and we have to have the regulatory framework that looks after that.

I also envisage the day when we see a drone handcuffed in the back of a police car because it has just delivered drugs to somebody.

Notwithstanding the fact that a lot of these things are going to be gifts at Christmas, my prediction is that within a year a lot of them are going to be sitting up on a shelf somewhere when the novelty has worn off, which leaves us with two sectors. One is commercial, and commercial has some very robust visions. The other is the hacker. When I was a kid, back when we were banging rocks together, we used to love to soup up our cars. Somebody had a brilliant idea. Why don't we create drag strips, so the kids can get out and safely demonstrate what they are doing? As we speak, there are hackers in basements building bigger and faster drones that can go higher.

I guess I'll look to you, Mr. Moher, and Mr. Moffatt, you can comment as well. Has there been any thought as to how to engage these hackers, bring them out, let them play in the sunshine, and let them innovate, instead of forcing them into the basement where they are going to be up to no good?

Mr. Kerry Moher: That's an interesting topic, and you're right. There are some limitations on the drones that are available right now. If you asked a number of the manufacturers about the current regulations, one of the topics is a design requirement.

Mr. Ken Hardie: You know as well as I do that there is going to be somebody who is going to modify that.

Mr. Kerry Moher: Right, and I guess that design requirement would criminalize them for doing those types of things. They would have to sign off on not making some of these design requirements. It's a bit of a balance. You heard other witnesses earlier. Some of those modifications they are making make that, in fact, safer.

Mr. Ken Hardie: Yes, but Mr. Badawey was absolutely right on. Unfortunately, it's pretty easy once you really start thinking to black hat this a lot.

Mr. Moffatt, what do you think? Should we create the equivalent of a drag strip for the hackers who really want to have fun and innovate with these things, but to keep them from going to the dark side?

Mr. Marc Moffatt: I don't know if I'd call them hackers, but there are a few companies in Canada that if you look at the system behind, there's no airworthiness confirmation behind it. These systems have been put together and we haven't really put them up to the rigorous testing we would do for an aircraft. I'll take the example of a laptop. You turn—

Mr. Ken Hardie: Quickly, please, if you could, because I have some more questions.

Mr. Marc Moffatt: You need to make sure when you put these things together that they are airworthy, that they are thoroughly tested. When we implement those rules, from the airworthiness aspect of systems, then we'll see some of these systems disappear, in my opinion.

Mr. Ken Hardie: With respect, we need to factor in the people who will not play by the rules, who will not put identification on, who will not put a transponder on them. We need to engage these folks rather than, as I say, leave them to their own devices.

This brings me to the key question I have.

Public confidence—somebody mentioned it in the first panel—is going to be critical to the growth of this industry. It's going to happen anyway. I mean, that train has left the station and I think we all agree that the genie is out of the bottle on this thing. Further to what my colleague here was talking about earlier, if I'm writing recommendations, and I will be, I'm going to be suggesting that industry has to take a proactive lead in helping us manage this technology. It isn't going to be left up to the government, or an understaffed Transport Canada, to deal with it. You guys have to get out in front of this, if you're going to enjoy any kind of public confidence. Do you have any comments on that?

● (1035)

Mr. Paul Di Benedetto (Chief Technology Officer, Drone Delivery Canada): Sure, absolutely. It's nice to meet everybody today, by the way.

One of the things that we took a look at when we started this endeavour was exactly that type of rogue mentality. You look at our UAVs that we plan on putting into the skies. These are larger than the ones that you see behind us, because we are going to be moving merchandise to remote communities, and so forth, and down the road to a home, a driveway, a rooftop somewhere. The imperative thing that needs to be looked at in all these UAV manufacturers, and all the people who look at these systems that these UAVs come out of, is an ability to ground stop these vehicles. Our embedded systems, that we made sure are built up with that philosophy from the ground up, if there's a ground stop, or Transport Canada or NAV Canada needs to say that you cannot fly, those UAVs shouldn't be taking off at all. If there's a way to enact legislation, a law that forces the manufacturers of these chip sets, like companies such as Intel, AMD, and other manufacturers—

Mr. Ken Hardie: I get where you're going here, but back to you guys. You actually have to help us come up with this.

The Chair: Hurry, Mr. Hardie.

Mr. Ken Hardie: I've run out of time. My advice to you is to get ahead of us on this, because you don't want draconian regs that slow you down and put us further behind.

Mr. Paul Di Benedetto: Yes, absolutely.

The Chair: Mr. Aubin.

[*Translation*]

Mr. Robert Aubin: Thank you, Madam Chair.

I would like to go back to the subject of education, which seems critical to me. It seems to me that the industry will make greater strides in the area of professional use. That is actually already more regulated than the recreational side, even though the recreational side takes up more space at the moment.

I am fine with your drones flying over our forests and pipelines and in the far north. But when the neighbour's drone flies over my backyard, I have a problem, not with identity theft in this case, but with the shattering of my privacy.

How do you deal with the right to privacy with something as new as the drone industry?

Let us start with Mr. Moher.

[*English*]

Mr. Kerry Moher: All of our courses have a very strong ethical component to them. In building out that curriculum, if these are key issues, of course there's legal ramifications, and any operator needs to know what the regulatory requirements are. That has to be in the training, of course, but then there's that grey area. That's where the training can come in. A big component of a lot of our courses deals with scenario-based training. We put them through different scenarios and allow them to have some thought-provoking opportunities to consider what they may or may not do in certain situations.

[*Translation*]

Mr. Robert Aubin: Since you mention a grey area, for me, it is that current privacy regulations are not sufficiently precise for you to deal with the entire problem in your training sessions.

[*English*]

Mr. Kerry Moher: Certainly, if those are going to be the legal requirements, and if that's what we want the course to cover, it can cover whatever the curriculum would mandate. I would argue that it wouldn't just be the rules and regulations. Sometimes you need to go beyond that into some areas where they need to be a bit more thought provoking. We talked about the idea of stewards here.

Most drone operators are the most ethical you can imagine. I don't have a cynical view of my neighbours. I didn't have it before drones were around, and I won't have it moving forward. That doesn't change my perception of things. Certainly, if these are concerns, then let's ensure that's part of the training.

[*Translation*]

Mr. Robert Aubin: Do either of the other witnesses want to add anything, or make any suggestions, about the ethical aspects of the drone industry?

Mr. Marc Moffatt: I can talk about awareness. I can give another example of what one company has done.

The little system we saw, the one from DJI, comes in quite a small box. The company has put on a large and very visible sticker on the side of the box, informing the purchaser to go to the Transport Canada website to get information about privacy, given the problems involved.

In this case, the distributor took the initiative. It was not done because of any Transport Canada regulations. There are a number of similar examples that could be used.

● (1040)

Mr. Robert Aubin: Thank you.

[*English*]

Mr. Paul Di Benedetto: Leaving a lot of this up to the operator is the area of problem here, especially in the recreational world. The philosophy is there have to be technologies built into these UAVs at any level, recreational and commercial, that force these UAVs not to do specific things, be it not flying at a particular height, be it not exceeding a certain geofence that's around Parliament or around certain schools. These are technologies that need to be embedded that cannot be altered, not by a consumer. There are always going to be hackers that will try to do things to it, but this is technology that we need to bring, activate, and propose to the manufacturers.

We have close relationships with the manufacturers we use. That's the driver for us on what we do for safety. The last thing you want is for someone to take control of a UAV that's in the sky doing something. On the recreational side, you look at these smaller drones, and we see them as toys. In reality, they're not toys. They're toys to us, but they can be malicious to other people.

The manufacturers need to take up some responsibility. We, as designers and operators, have a very vested interest in this to protect the security of not only ourselves and our clients but the populace in general. I think it's something that needs to be addressed with the manufacturers who put out this technology, saying that this has to be in there, and it has to be at the base, ground level of the technology.

The Chair: Thank you very much.

Mr. Sikand.

Mr. Gagan Sikand: Thanks for being here.

Thanks, Tony, for mentioning that article with the defibrillator. I tweeted about that last week. I think it's great that first responders can get something that flies as the crow flies, especially in rural areas. I'll get back to that if I have time. I am splitting my time with my colleague.

Kerry, if we were to have a course, would that be in partnership with the government?

Mr. Kerry Moher: Ideally it would be.

We've seen the curriculum that's been laid out. There's a draft of it. In the analogy to the pleasure craft operator card program, there's a set of standards that need to be covered.

Mr. Gagan Sikand: It's in partnership with the government.

I had Amazon's largest distribution centre in my riding until they opened one up down the street. It's in another riding now. I know their pilots were coming to Canada to be trained to go back to the States.

If you come to Canada and get this certificate, are you allowed to operate in the United States?

Mr. Kerry Moher: That was because at the time you couldn't operate. They couldn't even get the training done in the United States. Eighteen months ago, you couldn't legally operate a drone commercially in the United States.

Mr. Gagan Sikand: Now they can.

Mr. Kerry Moher: Now they can. I have to say that because of that limitation, it's not that it wasn't happening, it's just that it wasn't legal.

Mr. Gagan Sikand: Okay.

What I'm getting at is that America is a huge marketplace. I want somebody in Texas to be able to go online in partnership with Canada, pay a fee, get a licence, and operate a drone down there. I want us to make money off of this, U.S. money, as well.

Is there a way we can get that reciprocity that you were talking about, so that we're harmonized and so that what I just mentioned becomes a possibility?

Mr. Kerry Moher: We would do our very best to help you get that reciprocity, but obviously, we couldn't determine that. We understand very well what the requirements are, and we would like to help Transport ensure that there is reciprocity, for sure.

Mr. Gagan Sikand: I can drive in the United States. I see this as the same thing. It's a licence. The technology is the same. The operation is the same. I think we can benefit.

I'd like to split my time.

The Chair: Mr. Iacono, quickly.

[*Translation*]

Mr. Angelo Iacono: My question goes to the people from Drone Delivery Canada.

If I am correct, you want regulations that would allow you to make deliveries with drones. It may be pizza delivery, medication, even bigger things, as you mentioned just now.

How do you foresee making deliveries by drone safely, given that it will not be possible for the pilot to be constantly within sight of their drones, as is currently required?

I have a second question. In your view, who will be held responsible if, during a delivery, there is an accident involving a drone and a person, a car, a truck or anything else? How will liability be determined?

● (1045)

[*English*]

Mr. Paul Di Benedetto: To see what we envision and what we are practising, imagine a railway in the sky. Our UAVs would follow a predetermined path. These aren't similar to the UAVs behind us that you can take up with a joystick and fly wherever you want. Our UAVs would operate on a predetermined route. They would be vetted by the regulatory body, Transport Canada. They would operate at a specific altitude and speed, and in certain weather conditions. Once things are exceeded, they wouldn't fly. That is how we envision this operating.

To start, it would be in a very controlled environment. The UAVs would take off from what we call a drone spot, which is a predetermined parking spot location where it's a controlled environment, so humans can't walk into it when the UAV is starting up. It would also land at a controlled location.

For us, as my colleague Tony mentioned, it's crawling. We're not going to have UAVs landing on your doorstep tomorrow, because there's a lot still to learn. There is a lot of safety, a lot of regulations, and there are a lot of processes that we still all need to learn.

The Chair: I hate to cut you off, but to my colleagues, it's come to the end of our meeting time. The room is available, so for the committee members who have a few extra minutes, the equipment is set up, and you can ask some more questions, if you would like.

Thank you very much for this valuable information.

At this point now, I must adjourn this meeting.