

Science and Technology Committee

Oral evidence: Commercial and recreational drones use in the UK, HC 2021

Tuesday 9 July 2019

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Watch the meeting

Members present: Norman Lamb (Chair); Bill Grant; Stephen Metcalfe; Damien Moore; Graham Stringer.

Questions 330 - 508

Witnesses

I: Gemma Alcock, Founder, SkyBound Rescuer; Professor David Dunn, Professor in International Politics, Department of Political Science and International Studies, University of Birmingham; and David Phipps, Chief Executive, British Model Flying Association.

II: Baroness Vere of Norbiton, Parliamentary Under-Secretary of State for Transport, Department for Transport.

Written evidence from witnesses:

- [University of Birmingham](#)
- [British Model Flying Association \(BMFA\)](#)
- [Department for Transport](#)

Examination of witnesses

Witnesses: Gemma Alcock, Professor David Dunn and David Phipps.

Q330 **Chair:** Welcome, all of you. Thank you very much for coming in. Before we start the questions, if members or witnesses have any declarations of interest that they want to make, it would be helpful if they made them now.

I would be grateful if all three of you introduced yourselves. Incidentally, you may feel that someone else has satisfactorily answered the question that has been put to you and that you have nothing to add, so don't feel that you all have to answer every question, because we have quite a lot of stuff to get through. Can we start with introductions?

Gemma Alcock: Good morning. I am Gemma Alcock. I am the founder and CEO of SkyBound Rescuer, which is an organisation that specialises in the use of drones by emergency services. I work with emergency services to help to optimise their drone deployments. I work with the drone industry—hardware, software, training and other—to help it to create optimal solutions for emergency services. I am also the director of air services for Lowland Rescue, which is a search and rescue charity that searches for missing vulnerable people, from hills to high water, on behalf of police forces across the UK.

Professor Dunn: Good morning. My name is David Dunn. I am professor of international politics at the University of Birmingham. I specialise in security issues and have worked on the area of drones, both large and small, for the last seven years. I have published a variety of things, including the Birmingham policy commission report and various other articles, particularly on the nefarious use of drones.

David Phipps: Good morning. I am Dave Phipps. I am the chief executive of the British Model Flying Association, which is the oldest and largest air sports association in the UK, representing the largest community of unmanned aircraft operators. We have done so safely for the last century. We are approaching our centenary, in 2022.

Q331 **Chair:** Very good. How can education play a role in safe drone use?

David Phipps: The record established by the model flying community is a demonstration of that. Our traditional activities are a bit different from what people associate with drones, in that the conventional aircraft that a lot of our members fly require a greater degree of skill to operate. In a lot of cases, that is something you cannot do on your own. If you go into the middle of a field and try to fly an aircraft, the chances are that it will be a fairly short-lived enterprise. That tends to drive people in the direction of associations and clubs, where they get instruction, guidance, training and education.

Q332 **Chair:** That, in turn, helps to ensure that it is done in a safe way?

David Phipps: Yes.



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Professor Dunn: That is a difference between drones and model aircraft. Drones can be operated very easily without that set-up and background. It is part of the problem of drones that we face. There is an education programme—a drone code online, and all that—but what we see is people either ignoring that or blatantly flouting it. We describe them in our research as the blunderers. The blockheads are also a problem—those who know that they will not be caught and, therefore, fly these things in the flight paths of aircraft, at heights that are inappropriate and beyond the line of sight. There is a whole range of things that are done by people who are using drones in a way that education does not touch. Yes, education is essential. It is also currently inadequate, but it is not enough by itself. We need much more than that.

Q333 **Chair:** This is for the avoidance of doubt, after our previous session. You referred to blunderers and blockheads. I take it that you are referring to a small subset. I do not want to put words in your mouth, but would you say that the majority of drone users are responsible drone users who do it properly?

Professor Dunn: Yes, they are, but that is not the problem.

Q334 **Chair:** I want to avoid people taking offence and thinking that there is any suggestion that the majority of people are blunderers or blockheads.

Professor Dunn: It is a valid point to clarify. I am not talking about all things; I am talking about the problem areas. Those are the ones we need to concentrate on. The tendency is to think about the regulatory environment as to do with the benign users, but we also need to think about how we deal with people who are using these things deliberately, either through ignorance or through arrogance. Indeed, there is a third category—

Q335 **Chair:** You said that, although in some ways the role of education is limited in what it can achieve because of those who choose to opt out, it is inadequate at the moment. Before we come back to you on that, David wants to make a point.

David Phipps: With regard to those who operate unmanned aircraft in the four recognised associations, which include people operating multi-rotor drones, our view in terms of the law is that our members are generally clued up, careful and compliant.

Q336 **Chair:** I have noted the words that you used there.

Gemma Alcock: There is a large number of safe and responsible recreational and commercial drone pilots in the UK. Changing regulations will only impact those who are already flying legally, responsibly and safely, whereas education can target those who are breaking the rules because they do not realise that there are rules to stick to or because they do not realise the risk posed by not following those rules. Education could solve a lot more of our problems than regulation can. Education should come first and regulation second.



Q337 Chair: Should education be a voluntary exercise or should it be imposed in some way, to ensure that, before people start to fly drones, they have to go through a more substantial education process than they go through at that moment?

Gemma Alcock: We need to get better at how we target the people who are flying drones or are going to purchase drones. The point at which most people ask questions about any form of technology is before they purchase it, before they commit their money to it, so we need better education of the point of sale people for drone technology.

If you go to a drone specialist supplier, quite often they are NQEs as well, so they can give that information very well, but, at high street electronic shops, point of sale staff often do not know the drone code. When you buy a drone from those shops, they have signs on the shelves in front of the drones that bullet-point the information that they feel is most important to a customer. Quite often, what is listed is the maximum flight distance of the drone. If someone has no idea that the drone code exists and has bought a drone that says that it can fly 5 km, they will probably want to go home and try that. That information is dangerous, and it is illegal for the pilot to do it. We need to educate the point of sale staff better. That is how we reach the people who are going to buy drone technology. They are the ones who need drone code information, as well as the people flying the drones.

Q338 Chair: David Dunn, you said that current levels of education provision are inadequate. What needs to be done? How should we ensure that everyone actually gets access to it?

Professor Dunn: I would make them do a test—a proper online test. The equivalent situation is the more liberal states in America with regard to gun control. You can go and buy a gun when you have not had any training. That is where we are in the UK now. These things are potentially lethal. We are allowing people to buy them off the shelf without any background checks or licensing or any idea of where they go thereafter, yet these things can be used, potentially, with lethal consequences. That is what we are talking about.

Q339 Chair: There should be licensing? You should have to have a licence to fly?

Professor Dunn: There should be a licence for individual drones and for individual flyers—for individual flyers, not clubs. I would also like each drone to have an electronic signature that links it to the person. That is the only way you will deter the misuse of those things. It would also help to deal with potential criminal and terrorist use, because you would be able to discriminate between those who were licensed and those who were not. That would put you in an advantageous situation for dealing with threats.

Q340 Chair: When you talk about an online test, you are not talking about a test that involves the practical exercise of flying a drone; you are talking



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about being able to answer questions online. Is that right?

Professor Dunn: My position comes from the research I have done with people in the security industry, the airport industry, counter-terrorism police and local police. Opinions vary. They regard an online test as the minimum. Many police and security people would like to see proper physical tests as well.

Q341 **Chair:** What do you want?

Professor Dunn: I am probably inclined to think that if we had a range of different safeguards—background checks and licensing—an online test would be enough for the flying part of it. We need to know who is flying these things and to be in a position to respond accordingly.

Q342 **Chair:** Is there a danger that, if you make it too onerous, a lot of people will simply opt out of doing it?

Professor Dunn: There is a danger, but the danger of that is less than the danger of having unlicensed drones flown in the path of aircraft.

Q343 **Chair:** David Phipps, I notice your body language. You have been shaking your head.

David Phipps: For the model flying community and those within the associations, what David has described seems to be a sledgehammer in the absence of a nut. As far as I am aware, there is no problem to address with association members. We have established a good record. There have been no prosecutions involving our members. Our members consider themselves to be part of the aviation community, and pilots first and foremost. They do not buy the drone as a gadget simply to take photos. It is a different mindset completely.

Q344 **Chair:** David Dunn, you described the potential danger of the use of drones. Does the danger relate only to people with bad intent, who, ultimately, will not participate in any licensing system anyway, or does it relate to people who use drones for perfectly proper recreational purposes but, because they are not properly trained, there are real dangers involved in that? What are we actually talking about?

Professor Dunn: It is both. Certain people use these things at the edge of their range and capacity, thinking that they are compliant with the law, yet they cause a problem to aviation. If these things are licensed, regulated and identifiable, in a way they are not just now, that will be a deterrent against them doing that. It will be a deterrent for the blockheads who are not deterred by current regulations and, therefore, know that they can act with impunity.

Q345 **Chair:** If those people chose not to get licensed, they would, in effect, commit an offence of flying without a licence?

Professor Dunn: They would also be identified as such, because they would be in the airspace without conspicuity.



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Q346 **Chair:** Gemma, what is your view on this discussion and the disagreement between David and David?

Gemma Alcock: You are assuming that pilots are breaking the rules knowingly and causing risks knowingly.

Q347 **Chair:** If someone has not been educated.

Gemma Alcock: I think that education would solve a lot more.

Q348 **Chair:** David Dunn is saying that, in effect, we should force education by requiring it as part of a licensing process, and that because, ultimately, drones are potentially very dangerous, everyone who wants to use one should be required to go through a process to secure a licence. That process would involve education. Is that something you agree with, or do you think it is not necessary?

Gemma Alcock: Education is definitely needed. Enforcing it by regulation is the part I am not sure that I agree with. I think it could inhibit the growth of the industry. We want to enable the growth of the industry, but in a safe manner.

Q349 **Chair:** If you provide all the education that you think is necessary, but someone chooses not to engage in it, because it is not compulsory and they do not have to get a licence, that person can then fly a drone above the maximum limit, fly it beyond its range and, surely, behave in a way that is potentially dangerous, not through any malicious intent, but because they have chosen not to engage in your education. Are you not worried about that?

Gemma Alcock: Of course that is a concern. I think that a good education campaign can reach even those who are not actively seeking it.

Q350 **Chair:** But some will always choose to opt out of it, won't they? Are you not worried about those people?

Gemma Alcock: It is not about not being worried about those people. I think they are a minority.

Q351 **Chair:** Aren't those the ones who are potentially dangerous? It will always be a minority. We have to put to one side people with malicious intent, because they will simply avoid any system that we put in place. The ones I am interested in are the ones David Dunn addressed—people who do not have malicious intent, but who could still potentially pose a real threat through ignorance, because they have not gone through an education programme.

The question I am trying to put to you is, do we simply not worry about the minority who do not go through the good education process that you want to introduce, or do we say, "Actually, that minority are the very ones who could cause a very real threat, and we should require them to do that."?



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Gemma Alcock: An online test is one potential solution, although we will have to make sure that it is educational to the right degree. It cannot be so simple that you can skim-read it, pass it and still not come away with a sufficient amount of knowledge of the drone code to be a safe drone pilot. Equally, it should not be so complex that you forget the key messages as soon as you pass the test, because, again, it will not have the desired outcome.

Q352 **Chair:** Do you think that the online test that the CAA is introducing will be sufficient for that purpose?

Gemma Alcock: Provided we make it known to the general public. A key problem at the moment might be that people do not know that the drone code exists. Once they find it, they find it very useful. We need to look at how we get that message across to people.

Q353 **Chair:** Are there any other comments?

David Phipps: The major concern from our point of view will be those with malicious intent, rather than those inadvertently breaking the rules.

Q354 **Chair:** You do not think that people inadvertently breaking the rules because they have chosen not to engage in education pose a threat?

David Phipps: I think that is a decreasing risk. The drone manufacturers have a role to play in all this and in dealing with some of the problems we have encountered so far. Essentially, they are supplying consumers with a gadget that has far too much performance and capability. Why sell them something that they can operate 5 km away, when, in reality, the law requires that they keep it within the visual line of sight? While the drone industry has some responsibility, I think that it is taking its responsibility increasingly seriously.

Q355 **Chair:** Should regulation require the drone industry to sell to consumers only up to a certain standard?

David Phipps: The big manufacturers are now incorporating online tests in the registration process for activating the drone when you buy it. You have to go through a process to establish that you are familiar with the law.

Q356 **Chair:** Should we just leave that up to the manufacturers, or should we require it of manufacturers?

David Phipps: That is a matter for you, in a way.

Q357 **Chair:** The point of this session is to ask for your opinion.

David Phipps: The drone industry is doing it on a voluntary basis.

Q358 **Chair:** Are you happy with that?

David Phipps: It is a very positive step, in the absence of anything else in the meantime. The in-built technology within drones now, which has



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geo-fencing, height limitations and so on, will also help to reduce unintentional lawbreaking.

Q359 **Chair:** Before bringing in Stephen, I will take a final comment from David Dunn.

Professor Dunn: I want to pick up a few points. David Phipps said that there is a decreasing risk. Far from it. The capabilities of drones are increasing, and the number of drones in operation is huge. Millions are produced and sold every year. Ten or 20 years down the line, we are talking about aerial taxis—drone taxis—coming in. The sky is becoming increasingly cluttered.

Most of the people I do research with, in the questionnaires and interviews that I do, say that in their view the number of airprox incidents reported means that a collision with a drone resulting in loss of life is an inevitability in the next five years. That is because of the sheer number of these things being flown. We have avoided an aircraft coming down by pure chance, rather than any luck or judgment on the part of the regulatory framework.

You made the point that we should put to one side those with criminal intent. We need to think about the whole air environment. Regulating law-abiding users is a way of making it easier for the law enforcement agencies to determine who is a criminal and who is not.

Chair: Understood.

Q360 **Stephen Metcalfe:** I have a slightly strange question to start. Are all drones created the same? Are we using a blanket approach? We have quite heavy, large drones that you can buy from high street electronics shops, along with ones that weigh a matter of a few grams. Do we need some differentials between different types of drone and the risk they present?

Professor Dunn: Absolutely. There are different problems with different sorts of drone. For those with a camera, there is the problem of stalking, following people home, filming nudist beaches and over kiddies' pools, and things like that. I was talking to police about that last week. For even small ones with a camera, there may be a set of regulations with regard to privacy, to deal with the intrusion and voyeurism that go with those.

In terms of the impact on aircraft, it is anything under 250 grams. That is the point at which the Americans differentiate between things that are a danger and things that are not. There are those things. The heavier drones get, the more likely they are to bring down an aircraft. There needs to be a sliding scale of regulation for different sorts of drone.

Q361 **Stephen Metcalfe:** That is fine. There should be a sliding scale.

Gemma, you mentioned potentially educating those at the point of sale in how drones should be used and what the regulations are. Is it reasonable



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to think that, when you are selling a drone that is under 250 grams for a few pounds, there will be the same regulation as when you are selling a drone that weighs kilograms for a few hundred pounds or £1,000-plus? Would you apply the same rules to any sale of drones?

Gemma Alcock: In terms of the level of education?

Stephen Metcalfe: Yes.

Gemma Alcock: It needs to be a sliding scale as well. The drone code is a good starting point for any weight of drone.

Q362 **Stephen Metcalfe:** That is a good point, because that is really what I wanted to get to. Is the drone code appropriate for a wide range of equipment that goes from a few grams to multiple kilos?

David Phipps: In terms of differentiating our activity, our aircraft tend to be piloted. If you stop moving the sticks, they crash. That goes for the drones that our members operate, too. Essentially, they are racing drones. They do not have the autonomous systems and autonomous flight capability of a lot of the high street camera platforms.

A scale of regulations is something that we have had in place for many years. Our first threshold is 7 kilos. Below 7 kilos, traditionally there has been very little restriction. Above that, there are some additional responsibilities and limitations. Once you reach 20 kilos, there is an inspection process for design and build, and testing the pilot in combination with the model. We already have an existing scale.

Q363 **Stephen Metcalfe:** That is useful. With regard specifically to the drone code, what is your view of it more widely? Do you think that there are changes that could be made to make it clearer, more widely available and more accessible?

David Phipps: Essentially, it encapsulates the simple way in which we have operated for decades. The essential requirements are, "Don't endanger any uninvolved people or their property. Don't endanger any other aircraft. You are responsible for the safety of the flight that you take." It is a simple set of principles that has served us well for decades. It is a simple message that all our members carry, hopefully.

Gemma Alcock: I think that is a very useful message, if you want to find it. It is very simple to follow, and it is very easy to find if you are looking for it. The problem at the moment is that if you are not looking for it, because you do not know that it exists, it is very easy to miss. The message itself is simple and clear, but getting the message out there needs some improvement.

Professor Dunn: By itself, it is inadequate. We have operated model aircraft for 100 years, but now model aircraft are used around the world as fighter aircraft. Look at what the Houthis are doing with model aircraft in Yemen against Saudi Arabia and the UAE. Look at the instances where



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model aircraft have been filled with explosives and plans have been made to use them against the Pentagon in Washington. We are in a different environment in terms of non-state actors using aerial systems, in Raqqa or even—

Q364 **Chair:** But those characters are never going to engage in education.

Professor Dunn: Yes. The way in which this debate is framed is that it is about the legal, compliant user. I am making the point that you are missing the point.

Q365 **Stephen Metcalfe:** Putting aside drones and model aircraft, you are talking more about knowing what is in the airspace. Because we now have multiple small objects flying—drones or model aircraft—we need to know what they all are, because there are so many of them and the uses can be malicious.

Professor Dunn: Yes, and the more there are, the greater the capacity to hide in plain sight. That is part of the problem.

Q366 **Stephen Metcalfe:** It is not the fact that a malicious user would not register; it is that we will need to know what all of them are. If there is one that is not registered in that mix, we have a better idea of what it may or may not be.

Professor Dunn: You then have the capacity to say, “Everyone stop flying.” Therefore, you can identify the real problem.

Q367 **Stephen Metcalfe:** I want to bring David Phipps in.

David Phipps: In terms of model aircraft, our members operate from point A to point A. They operate from fixed locations, generally in fairly remote spots. They do not operate in urban areas. It tends to be out in the middle of nowhere. We are easily identified as operating within a fixed radius of a point, so I would argue that that is slightly different.

Q368 **Stephen Metcalfe:** I understand what you are saying, but what I had not quite grasped previously was that, if you are looking at an overview of some airspace, with your pilots operating from A to A and some drones operating from A to B, B to A and back again, potentially, you could have a malicious operator operating from A to C. I am stretching this a bit, but I think that what Professor Dunn is trying to say is that by knowing everything, because everything is registered and is giving out some sort of signal so that you know where everything is, when you see something and do not know what it is, you can identify it as potentially—only potentially—malicious. I am putting words in Professor Dunn’s mouth now, but perhaps that is why he is supportive of a wide registration programme, including for model aircraft.

Professor Dunn: Yes. It is not just registration. We also need the capacity to monitor what is going on.

Q369 **Stephen Metcalfe:** Yes. We will come to that.



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Professor Dunn: For that reason, we would think about whether we should tax these things, whether we should have a sky road tax.

Q370 **Stephen Metcalfe:** There is a good argument to be had. It is interesting. We want to make sure we have got the point that is being made.

Professor Dunn: You've got it.

Q371 **Stephen Metcalfe:** Moving on from the drone code, which is a starting point, the CAA is introducing a mandatory online knowledge test this autumn, as the Chairman mentioned. Is it designed to be applied retrospectively to all those who already have drones? How am I going to find out that I need to do it?

Professor Dunn: It would be pointless if it did not.

Q372 **Stephen Metcalfe:** Yes, but I've got no idea. I got a drone a couple of Christmases ago—a little one—and I have no idea.

Professor Dunn: In the same way as car licences were not required and then become the law, because people did not have foresight as to the dangers cars could provide, we just go there. We need an advertising campaign to make sure that people are aware. We also need to train and to empower police officers to do it. Just now they are not empowered to do much about drones.

Q373 **Stephen Metcalfe:** What would you do if you found me operating without a licence? Would I get a warning in the first instance?

Professor Dunn: Yes. The police do not have the legal authority to take down a drone that is operating over Gatwick, for example. We need legislation that equips and trains the police, and provides for them to be able to intercept malicious drones. Again, that is not part of this debate.

Q374 **Stephen Metcalfe:** Gemma, do you want to add anything?

Gemma Alcock: I do not feel that I have an opinion to add on that point.

David Phipps: Our members are acutely aware of the imminent requirements. We have a direct means of communication with all our members, which is one of the strengths that associations and communities provide. The CAA had its largest ever response to a consultation, largely as a result of the communication sent to our members, who feel that they are being unfairly vilified because of the actions of a small minority of rogue drone operators.

Stephen Metcalfe: Yes.

Professor Dunn: It is the same argument about guns in America, of course. Why should we all have to license guns and have background checks when only very few individuals actually cause a problem? Everyone should have guns.



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Q375 **Stephen Metcalfe:** I hear what you are saying. We have to have a public awareness campaign and empower the police, but probably millions of people have been given smaller drones as gifts, or whatever, and I fear they will have no idea that this is coming in. The other point is that they may not use them very often.

Professor Dunn: All mine are broken.

David Phipps: There is also the danger that it may drive some activity out of organised associations or communities if the fees and bureaucratic requirements are set too high. One or two of our members have already suggested that they will go into the middle of nowhere and continue to operate, on the basis that it is highly unlikely anyone will challenge them. They would run that risk, so it may have the opposite effect from what you are trying to achieve.

Q376 **Stephen Metcalfe:** In a moment, I will move on to the national qualified entities pilot competency test. Before I do that, do you accept the point Professor Dunn is making about understanding what is in an airspace? If everything other than the odd thing were registered, you would know where to focus, potentially.

David Phipps: If we were operating within a finite radius of a point, you would expect model aircraft to be within that.

Q377 **Stephen Metcalfe:** But model aircraft do not have to operate within that finite point, do they?

David Phipps: They do not have to, and if they were not operating within that fixed point maybe there would be an argument for additional requirements, but in terms of our 800-plus clubs that all operate within a fixed location I would say that—

Q378 **Stephen Metcalfe:** I want to make it clear that I am not suggesting in any way that model aircraft clubs represent any kind of threat or risk. I am absolutely, 100%, not suggesting that, but I take the point that, as David Dunn said, as airspace gets busier, knowing what is in it is also important. I do not want you to think this is an attack on model aircraft because I think they are very well regulated.

David Phipps: It would be easy enough to let you know we were there, maybe through some sort of notification system to geo-fence our activities.

Gemma Alcock: Other countries are starting to see a rise in drone parks as a safe space for people to fly. Perhaps, instead of potentially stunting the growth of the recreational drone market, we could have drone parks. As long as you fly at those points, you do not have to be registered, but if you are flying outside them you need to be registered. That would impact only on the commercial operators that need to fly anywhere.

Q379 **Stephen Metcalfe:** My final question is about the national qualified entities pilot competency test, which is quite a mouthful. Is that the right



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phraseology? Is it right that it is for commercial drone pilots? Do you think it is adequate? What feedback do you get from your members?

David Phipps: Our members are generally not commercial operators. We deal only with sport and recreation. We have our own scheme of achievements that has been adopted by quite a few other nations. It is a voluntary scheme, and just over half of our members have entered it. Those who operate within clubs generally have to go through some sort of test, in the club, to establish that they are competent to operate at the club.

Q380 **Chair:** This is about specific commercial drones.

David Phipps: We stop at sport and recreation.

Q381 **Chair:** David Dunn, do you think that the test for commercial drone users is sufficient, as Stephen asks?

Professor Dunn: From what I hear, where people do them it works fairly well. My police colleagues tell me that that they come across operators who have not bothered to do any of that and are operating outside the law. We need a system to make sure that they are not doing that.

Q382 **Chair:** Is it your view that we need to tighten it up to make sure that every commercial user goes through it?

Professor Dunn: Yes.

Gemma Alcock: I have worked with a lot of NQEs and often they are of the opinion that they want to coach their students to fly the drones instead of having just a practical assessment. It is difficult to make that commercially viable at the moment because, if you are the only NQE providing it, you will be a lot more expensive than other NQEs. I think most NQEs would like to start delivering flight training as part of their course; it is just difficult to make it commercially viable. We work with Essex police, who are an NQE, and they include a lot of flying in their course. I think it is a very good course.

Stephen Metcalfe: That is a very positive note.

Q383 **Graham Stringer:** First, I make my apologies. I have to leave after I put this question. We have heard about the training of drone operators. What about the training of emergency service operators? They potentially face a threat from drones and they could also use drones. What level of training is there, Gemma?

Gemma Alcock: At the moment, they follow the same route as commercial drone pilots. They will be trained by an NQE. There are two emergency service NQEs, Essex police and Lancashire fire, but they can use any other NQE as well.

Q384 **Chair:** For the purposes of anybody watching this, could you explain NQE?



Gemma Alcock: National qualified entities have been given permission from the CAA to deliver commercial drone pilot training. The emergency services use the same route. It is quite often a minimum requirement. They address tactics for different use cases and do a lot of continuing professional development before they are operational.

Q385 **Graham Stringer:** Do you think the training could be improved? Should it go to a higher level?

Gemma Alcock: No. It is at a good level, especially if they have gone to one of the emergency services NQEs and have incorporated a high level of flying as part of the training. It is at a good level at the moment.

What could perhaps be improved is tactics. That will come only as we better understand how best to use the technology in different use cases. There are constantly different use cases for emergency services using drones. Because it has grown on a rapid scale, it was difficult to use them in the most optimal way from day one, but it is constantly improving as the life-saving, life-preserving and public safety applications of drones grow worldwide. I think it is at a good level and is progressing in the right direction.

Q386 **Graham Stringer:** You are satisfied that they are trained to deal with drones that might threaten aircraft—an air ambulance service, for instance?

Gemma Alcock: From a non-emergency service drone?

Q387 **Graham Stringer:** From a drone that is being misused.

Gemma Alcock: I guess it comes back to the same issue of how we control them. It is everything we have discussed so far. The air ambulance is another form of manned aviation, so it is about how we address separating drones from manned aviation. It is the same problem space. Perhaps once we have worked out better unmanned traffic management and more robust anti-drone systems against drones flying with malicious intent, it will protect all forms of manned aviation, including the air ambulance.

Q388 **Chair:** David, do you have something to add?

Professor Dunn: A couple of things. To start with, it is worth making the point that the utility of drones for the emergency services is fantastic. The other point about drones entering the airspace of police drones, fire drones, air ambulances and the like is that the only response is to move the air ambulance, for example, away from the scene. We have lots of examples where police, ambulance or RAF helicopters have had to move away from doing operations because people watching and filming them doing their operation have endangered those aircraft.

The police are powerless in the sense that they do not have the legal authority to intercept drones, nor do they have the technology or training to intercept drones. It is not just about airports like Gatwick. The story is



writ large across the country where drugs are smuggled into prisons on a regular basis, or there are crime reports where people say, "A drone followed me home." The police say, "Do you have any evidence of that?" The police cannot do anything about it because there is no evidence to log. The amount of criminality committed by drones is massively under-reported because there is no way of getting any evidence of it, nor is there a way for the police to respond to it. Criminals know that and they can carry on doing it with impunity.

- Q389 **Graham Stringer:** That is very interesting and brings up a statistical point. You mentioned in answer to a previous question the increase in airproxes. Are you satisfied that the statistics on airproxes are accurate? You are only relying on one person to report it, whereas if it is an aircraft you are relying on two people to report it. Do you think the statistics are accurate, or are they under-reported?

Professor Dunn: That is probably the case. The airprox reports are often very detailed in what they describe, where they are and what they are doing. Therefore, it is not as if it is just a plastic bag in the way, as some people have suggested. The details are there. Just because a drone is near an aircraft, it does not mean that it has been sighted. It is still a danger whether or not it has been sighted. All the airprox reports we have are where drones have been sighted. The number may be 10 times more than that where drones are not sighted but are still a danger to the aircraft.

- Q390 **Chair:** In the example of an air ambulance landing in a location and drone users turning up to watch and film, you are clear that there ought to be rules to allow the authorities to impose immediate restrictions on flight in that area. Is that right?

Gemma Alcock: Yes. Australia has that as part of its drone regulations. If you see an emergency incident, you have to land and remain away from it. That would be a positive change in regulation. We get a lot of that. Often, it is not malicious intent; it is because they are trying to help find a missing person or help the emergency service. Quite often, that is not the outcome, despite their intentions. That would be a positive change in the regulations.

- Q391 **Chair:** David Dunn, you made a point about a drone following someone home. In that situation, the person operating the drone will not be someone who wants to go through the licensing process that you want to introduce because they have criminal intent perhaps. What do you do to address that?

Professor Dunn: We do it. If in order to buy a drone they have to be licensed, it may deter them from that kind of criminal activity, because they know there will be consequences for their action.

- Q392 **Chair:** What if the person has constructed their own drone, or got it overseas or whatever, and circumvented all the processes we have introduced? What do you do to stop that person operating a drone to



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follow someone home, or do anything else?

Professor Dunn: We have to insist that anything that flies must have a transponder on it and has to be registered. This is the big debate in America just now. The Model Aircraft Association is up in arms about the idea of having transponders on these things, but if we are to have any leverage on the illegal activity of drone use, we have to go down that route.

Q393 **Chair:** As you said, you exclude all legal users and then you know what you are dealing with as regards the one who is not?

Professor Dunn: You also deter criminal activity. There is now no deterrence for criminal use of a drone because people know there are no consequences.

David Phipps: You also deter a lot of local activity by applying those measures.

Q394 **Chair:** But he is talking about real threats.

David Phipps: Yes.

Q395 **Chair:** How do you address those?

David Phipps: I have a couple of points in response to some of the things that have already been said. Operating a drone in proximity to emergency services, HEMS and so on is already unlawful under the current regulations.

Q396 **Chair:** We were told at our last session that there needed to be an ability to impose restrictions, which does not exist at the moment.

David Phipps: That is true, but it is already illegal, and measures should be taken against anyone who does that.

We believe that quite a number of airproxes do not stand up to scrutiny. The UK Airprox Board, in a recent freedom of information request, conceded that in all cases there was no confirmation that a drone had flown close to an aircraft other than the report made by the pilot. We have looked at quite a few.

Q397 **Graham Stringer:** But who else could report it?

David Phipps: Where there have been airproxes involving model aircraft and manned aircraft, in a lot of cases it has been the model pilot who has reported it because the manned aircraft has been in the wrong place. None of those has involved passenger-carrying aircraft; generally, it is small general aviation. For the ones we have looked at in more detail, looking at the ADS-B data, we believe that some of the sightings are other manned aircraft at a greater distance.

Chair: I noted that point.

Q398 **Bill Grant:** Putting aside the drone code and the malicious use of drones,



I am trying to see if there is a read-across between the evolving drone community and the long-established—almost 100 years—model flying community. What information is there about the comparative safety of drones vis-à-vis model aircraft? Can the drone community learn from the safe, proven educational practices of the BMFA? Do we need to reinvent the wheel? Is there a lot of information?

David Phipps: To some extent, the issues arise from the different nature of the two distinct types of aircraft. The aircraft we fly are very much limited to unaided visual line of sight. You tend to operate them within a fairly short radius because the further they get away from you, the more difficult orientation becomes and the more likely you are to crash, whereas with a drone that is less likely because it has stabilised flight and autonomous systems. Whether it is a dot in the sky and barely visible or beyond visual, you can still get it back safely, whereas a model aircraft tends to be much closer because there is no pleasure in flying it beyond that.

Q399 **Bill Grant:** From that answer, I take it there is no read-across. The drone community could adopt the existing and respected practices of model aircraft users?

David Phipps: A key element of what we do is information and education. All our members receive a handbook that details the laws in place at that particular time, and a lot of guidance and information on how to operate safely. That goes to every member. Six times a year a copy of our magazine drops on to the doormat and that contains updates on changes in legislation and updates on where we are.

Q400 **Chair:** That is a good bit of advertising. Well done.

Professor Dunn: I think they are fish and fowl. There are many characteristics of model aircraft that are not appropriate to this. What we are talking about is the first iteration of the robotics revolution. It is a revolution in easy and cheap access to the air. You need hardly any training. These things are so clever that they more or less fly themselves. They are gyroscopically controlled; they are balanced, have cameras and can go much further. They can pop up just outside the perimeter of an airport and be a danger to flight within five minutes of being launched into the air. That fundamentally changes the calculation.

Q401 **Chair:** Picking up what Gemma said earlier, is there something to be said for a very light touch where people are flying drones in a designated location, just as we have heard about model aircraft flying, but if you want to fly anywhere else, you would require the full licensing you are talking about?

Professor Dunn: But we need to think about what happens if people do not abide by the rules all the time. You cannot have one set of regulations for one set of air users and a different set for another, because that does not protect you against the possibility of new technology being applied to it. For example, the drones being used by the



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Houthis are essentially model aircraft; they are fixed-wing aircraft that have within them better guidance and GPS systems.

Q402 **Chair:** But if you are using them only around an airfield, what is the problem with that?

Gemma Alcock: You will still be able to identify them as not licensed when they are flying outside safe spaces.

Q403 **Chair:** Can't we have one rule for safe space locations, such as an airfield in the middle of nowhere?

Professor Dunn: The FAA is going down the route of wanting them to have transponders too, so that all things are known and conspicuous to detection systems.

Q404 **Bill Grant:** I am sensing a distinct difference between a traditional well-proven system and brand-new technology. I am almost sensing that never the twain shall meet and they are distinctly different.

David Phipps: The European regulations, which come into effect in a year's time, give a differentiation for model flying as an activity. The IATA basic regulation includes in the recital the point that model flying should be allowed to continue essentially as it does today. In the IATA drone regulations, there are provisions for activities carried out within the framework of clubs and associations, which essentially allows clubs and associations to continue operating as they do today.

Q405 **Bill Grant:** On that note, putting aside the commercial operations, probably involving those such as Amazon for deliveries and so on, do you see any integration with the recreational use of drones? Some of your members may already be dual operators of traditional models and recreational drones, which I think you touched on. Do you see them coming together, or is there a barrier for drone pilots to integrate with organisations such as yourselves?

David Phipps: It depends on the activity. A lot of our clubs operate in remote locations. If you are buying a drone principally as a camera platform, flying from the same fixed location and taking pictures of the same farmer's field time and again would have limited appeal. It would not necessarily appeal to people who buy a drone as a camera platform, other than as a safe location from which to operate, but we have within our activities the British Drone Racing Association, which flies drones first-person view with goggles on.

Q406 **Bill Grant:** That is under your umbrella?

David Phipps: That is under our umbrella. It is quite a specific activity and tends to occupy a fairly small footprint. It operates at very low level because there is no excitement if you are not whooshing close to the ground and around obstacles.

Q407 **Bill Grant:** What is your view, David Dunn?



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Professor Dunn: There has been an historical distinction, but a lot of the drones now being made are fixed-wing and have all the technology of the rotary-blade drones. Therefore, they can be operated over long distances and at great speeds.

Q408 **Bill Grant:** Beyond line of sight?

Professor Dunn: Absolutely beyond line of sight, and they pose a real problem. In many ways, they are more problematic in terms of their range and capability than some of the quadcopter drones, so making a distinction between the two different categories might be a bit more difficult than you think.

Q409 **Bill Grant:** Is one of the distinctions that operators of model aircraft tend to purchase small parts and assemble them? They partially build them and then operate them, whereas, for the moment, a drone is off the shelf.

Professor Dunn: You can do that with drones.

David Phipps: In some cases.

Professor Dunn: At Birmingham Drone Club, which I have spoken to, they build their own stuff; they enjoy the engineering challenge of building systems that are beyond the capabilities of ones you can buy commercially off the shelf.

David Phipps: But the ones that operate beyond visual line of sight are outside the scope of our activities anyway. Our association recognises only specific activities. Operations beyond visual line of sight is not one of them. One of the things we provide for our members, and one of the main reasons they join, is a comprehensive range of insurance cover. That is valid only for lawful and recognised activities, so it tends to limit their activities.

Professor Dunn: That is one element you can read across—compulsory third-party insurance as a requirement for drone ownership as a way of providing legal indemnity.

Q410 **Bill Grant:** We have found some common ground.

Professor Dunn: We have some common ground.

Q411 **Bill Grant:** Drones are going to become part of our life. How do we raise public perception and awareness? How do we organise these things? The public perception of drones can be quite negative. How do we improve that? How do we educate the public about what might be coming their way in the next five to 10 years?

Professor Dunn: Fundamentally, by ensuring that we do not have a major catastrophe. The drone industry has many advantages, but if we have a Hindenburg moment, we will have an industry that goes completely into reverse. The way to avoid that is to have foresight and



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vision as to what might happen and take active measures, not light touch, that make sure that those incidents do not happen, or certainly do not happen here.

Q412 **Bill Grant:** Do you agree that to tap into the potential benefits of the drone industry we have to take the public with us?

Professor Dunn: Absolutely.

Gemma Alcock: A lot of the public perception issues are about the fact that people do not know what the drones are being flown for or who is flying them. For example, in the maritime world there are apps that use AIS information. I use one called Marine Traffic. You can spot a boat, find it on the map and see its planned route and why it is on that route. If we had a similar concept for drones for the public to use when they saw a drone above them, they would be able to see it on the map and say, "It's search and rescue. It's not looking at me; it's not spying on me." I think that would reduce a lot of the mistrust. Knowledge is power, and at the moment the public do not have any knowledge of why a drone is above them, so they feel powerless and that is where a lot of the mistrust is coming from.

Q413 **Stephen Metcalfe:** Professor Dunn, I think you mentioned Birmingham Drone Club.

Professor Dunn: Yes.

Q414 **Stephen Metcalfe:** They modify drones and they like the engineering challenge?

Professor Dunn: Yes.

Q415 **Stephen Metcalfe:** They sound like an organised group, but there are lots of other forums. Individuals can find videos online and forums that tell them how to amend or modify their drone. Do you think that represents a risk if it is not regulated?

Professor Dunn: Yes. That is why we need the ability to identify things that are flying and things that are not registered and licensed, and respond to that. The world has changed hugely; the environment has changed beyond the traditional 100-year history of the flying club. There are many sources of information and, unfortunately, many malign actors.

Q416 **Stephen Metcalfe:** What can we do to mitigate the risk of websites and forums giving out information on how to change drones?

Professor Dunn: That is very difficult. For example, when companies introduce their latest drones with geo-fencing on them, Russian websites immediately put out the code to crack it, as a malign action. Therefore, there is a constant arms race in terms of those things. We need robust regulations across the board and robust resources for the police and others to respond when activities are detected.

Q417 **Stephen Metcalfe:** You previously used the example of guns in America.



It may be stretching it a bit, but I get the point. At least we all understand the risk that a gun presents. There are plenty of people who shoot recreationally through clubs and in clays, but we all understand that the gun presents a risk. I do not think enough people understand the risk that a drone can present. Do we need a raising of public awareness?

Professor Dunn: Yes.

Q418 **Stephen Metcalfe:** I know we keep coming back to this, but how do we do it? What do we recommend?

Professor Dunn: Gatwick was a good example, and one that raised awareness without a tragedy being associated with it. Drones are hard objects with lithium batteries. If they come into contact with a soft-skinned aircraft, they will likely make a mess of it at a certain speed, through collision with the flying surfaces, the engines or the cockpit. The British Airline Pilots Association has done tests on that. Drones penetrate.

The public are becoming increasingly aware. There are a number of documentaries. There is awareness, and that is partly why the general public are becoming more sceptical about the wisdom of drones flying over our heads.

Gemma Alcock: Public awareness of the risk is quite good, but at the moment we are lacking in how to mitigate those risks, how to fly properly and where to learn to fly properly. They know the risk, which is where a lot of the mistrust derives from, but we are not giving them the answers on how to mitigate those risks so that we can fly safely. There are a lot of positive outcomes from using a drone, so we need to educate the public on how to do that safely.

Q419 **Stephen Metcalfe:** Presumably, with the increasing autonomy of drones they present an increasing ethical risk as well. You can ask them to track people using sensors, not just cameras; you can have heat sensors and see at night. We come back to the idea that we need a full regulatory framework within which they should operate.

David Phipps: One of the dangers is that there is quite a lot of sensationalised reporting about the potential of what a drone may or may not do. There is a risk that we could end up with regulations developed on the basis of fear rather than fact.

Professor Dunn: However, we are thinking about the next 20, 30 or 40 years, and access to the air will change radically in that period. The advent of AI raises lots of different challenges. If you have not seen the video "Slaughterbots", you should google it and watch it. It is slightly sensational, but it is worth watching a potential world of AI-informed drones of the future and what they can do in changing the nature of warfare, policing and everything else that goes with these things.

There is the combination with cyber as well. We have not talked about drones being potentially spoofed and taken over by being hacked, or a



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swarm of drones being created to attack a stadium, airfield or aircraft, or drones flying into a secure area and then downloading malicious material through a cyber-attack inside the perimeter. The hybridisation of drones and other technologies—AI but cyber as well—presents a series of challenges that we need to be aware of and think through.

David Phipps: The threat to commercial airliners is one of the things that drives public perception. We have an assessment of the threat that I would be happy to pass on to the Committee afterwards.

Q420 **Chair:** Do pass it on. Thank you.

To what extent do either commercial or recreational drones pose a risk to privacy? Keep your answers tight, if you wouldn't mind.

David Phipps: In terms of our activity, to some extent it is irrelevant because the majority of the aircraft we operate are not equipped with cameras.

Q421 **Chair:** I am acutely aware of that. What about other uses of drones, not in designated spaces but elsewhere? What are the risks to privacy and how real are they?

Professor Dunn: They are huge. People like to hide behind high walls, fences, hedges and the like, and sit in their garden or play with their kids, and now anyone with 50 quid can get access to a drone with a camera that gives them the ability to fly over those defences, and beyond those screens, and spy on people.

Q422 **Chair:** Is there any way we can design or manufacture drones to mitigate the risk?

Professor Dunn: That is a difficult one, other than a wide framework of regulation, licensing and the like, to give the police something to go on when they respond. Police have said to me, "We are called to an incident and all we can do is log it. It is not recorded as a crime because we have no way of dealing with it."

Q423 **Chair:** But is there anything we can do in the design or manufacture of drones? Do we permit cameras routinely on drones? What can we do to reduce risk through manufacture or design, or can we not do anything?

Professor Dunn: There is no obvious answer.

Q424 **Chair:** Are GDPR and the Data Protection Act adequate measures for protecting individuals in respect of privacy, or are you not qualified to say?

Professor Dunn: I do not think it touches the drone issue.

Q425 **Chair:** I think it does. The data are being collected; it is absolutely relevant.

Professor Dunn: That is not my area. The police report that they are doing digital forensics when they capture drones and download material,



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but what they say is that, unlike mobile phones and computers, drones are not necessarily equipped for their software to penetrate them. My police friends tell me that they would like a requirement that the software on drones is accessible to police investigation.

Chair: We have to suspend briefly because we are not quorate without three members in the room. Apologies for the delay.

Sitting suspended.

On resuming—

Q426 **Chair:** Do you think the general public have any understanding at all of what the laws are in respect of privacy? What can people do? If, for example, they are followed home or they are sunbathing in the garden, or they are with their children and realise they are being watched by a drone, do we know whether any rules or laws apply in those circumstances?

Professor Dunn: Voyeurism is a crime, but the difficulty is acting on it as far as the police are concerned.

Q427 **Chair:** It is getting the evidence to do so. You are saying that people ought to be aware that, if they use a drone to engage in voyeurism, they commit a criminal offence?

Professor Dunn: Yes.

Gemma Alcock: It comes back to the fact that the public need to know why a drone is flying. Even if it is hovering above you, the camera may be pointing in a totally different direction and it is just by chance that it is above you. It could be part of a search for a missing person. The drone could be in the sky for a positive application, but the public feel that it is spying on them when it is not. They need information about why it is being flown.

Q428 **Bill Grant:** Could a drone fitted with a long-lens facility replace a long-lens camera to invade the privacy of celebrities and the wealthy who fence themselves in? Is that the new long lens?

Gemma Alcock: There are more inconspicuous ways of taking those photographs than using a drone. You put them up in the sky and you hear them. The drone camera has a very wide angle, so you will not get very good details of the person if you are far away.

Q429 **Bill Grant:** You do not see them as a recipe for the invasion of privacy?

Gemma Alcock: No.

Professor Dunn: The drone can have an SLR underneath it; it need not necessarily operate from its own built-in camera. There have been occasions when paparazzi have used those to get around that.

Q430 **Chair:** Is there a view that there ought to be more restrictions to protect



people's privacy, or do we think that the existing law is adequate?

Professor Dunn: The existing law is inadequate, in the sense that crimes are being committed with no recourse to justice. Drones are unable to be intercepted in a way that means the perpetrators can be brought to justice.

Q431 **Chair:** Are there any final comments from any of you before we finish this session?

David Phipps: The UK aspires to be a great place for aviation. We have a history as an aviation nation. Whatever happens, please do not kill off model flying, because it is a precious part of the aviation ecosystem.

Q432 **Chair:** I think you have got that message across very clearly. Thank you for that. Are there any other final comments?

Professor Dunn: Talk to people, as I have done, in various police forces, and in counter-terrorism police and those involved in the security of nuclear power stations, stadiums and airports about their concerns. There is a real need to think beyond the clued up, careful and compliant and to think about the potential misuse of drones as well. Think beyond the next five years about a framework that takes care of a revolution in access to the air.

Chair: Thank you all very much indeed. We appreciate your time.

Examination of witness

Witness: Baroness Vere.

Q433 **Chair:** Welcome, Minister. Thank you very much indeed for coming along this morning. We appreciate your time.

Baroness Vere: You're very welcome.

Q434 **Chair:** Within Government, is there a dedicated team with an explicit vision for looking at the future of drones, the opportunities as well as the risks involved?

Baroness Vere: There is not a dedicated team per se—

Q435 **Chair:** Should there be?

Baroness Vere: If you could give me a second, there are various elements to the future of unmanned aircraft, as I prefer to call them. For example, on the innovation side there is work being done at BEIS through the Future Flight challenge, which is very important and sits under the aerospace deal. Of course, in DFT, we have to make sure that the regulatory framework is appropriate, so we have a dedicated drones team looking at that. Within the CAA, there are various workstreams looking at both regulation and innovation. Obviously, those teams talk to each other. It is very important that we keep up to speed with what is going



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on in the market and how it is developing, because it is developing extremely quickly.

Q436 **Chair:** We have heard evidence that there is a need for Government, in a sense, to pull those strands together to develop an overarching vision for the future of drones, given the enormous potential economic impact of drones: the contribution to new jobs, more environmentally friendly means of delivering goods, the decarbonisation agenda and so on. How do you respond to those calls?

Baroness Vere: We have a vision and it is very clear what the Government's vision is.

Q437 **Chair:** Is it stated anywhere?

Baroness Vere: Not as such, but we did two responses to consultations in which we set out what we knew at that time in terms of where we felt the future was going. I do not think any of us in this room knows where unmanned aircraft will be in 10 years' time, but it is certainly our vision that we want to be a global leader in unmanned aircraft; we want to lead the way on regulation too, and I think we are doing that. We recognise that there are huge opportunities to be had for unmanned aircraft, but all of us also recognise that there are significant challenges to those opportunities being met in full.

Q438 **Chair:** Evidence from PwC and Nesta, in particular, highlighted that the technology is transformational, and that someone needs to be taking a lead in mapping out the future, making sure that the UK is a leader and that we do it safely and within a world-class regulatory framework. You do not think they are right in saying that we need to set out in writing what the vision is and how we get there?

Baroness Vere: I don't, I'm afraid. No, I don't, but there are people looking at this from a vision perspective and that falls under the future of mobility strand of the industrial strategy. Too much Government interference in setting out exactly where we want things to progress is very unhelpful. What the future of mobility strand is doing is working with industry as industry progresses the sector in the ways the market wants it to go. Our biggest challenge is creating the agile regulatory framework that can cope with all the different places that unmanned aircraft can go as a whole.

Q439 **Chair:** In evidence, we have heard about the economic benefits and efficiencies, particularly on decarbonisation, and about their deployment in building surveying, deliveries and so on. What assessment have the Government made of the economic contribution of drones, or unmanned aircraft, to the UK economy now and, say, in 10 years' time?

Baroness Vere: I am very sorry; I do not have any figures with me, but if I find any I will let you know.

Q440 **Chair:** As far as you are aware, the Government have not made any



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assessment of the potential contribution to the economy?

Baroness Vere: They may well have done. I have not seen it at this moment in time.

Q441 **Chair:** Do the Government have a plan as to how they maximise the economic benefits of drones to the UK economy?

Baroness Vere: Absolutely. As I mentioned earlier, it is about working with industry to make sure that it is able to develop as quickly as possible. I refer you to the Future Flight challenge, which is £125 million, linked to £175 million from industry, for taking forward various elements—for example, battery usage, electrification and all sorts of things to do with data sharing. There is a huge amount of work to be done, but I think Government's role falls into making sure that the barriers are as limited as possible.

First, technically, that is where the Future Flight challenge will come in. We need longer battery life. What many people forget about unmanned aircraft is that wind and rain can still be a challenge, and the laws of physics can be difficult sometimes. The technical challenge is one of the big areas. The second issue is the regulatory environment, which I think is absolutely critical, making sure that, alongside the regulatory environment, the airspace is appropriately modernised to take into account the massive increase in unmanned aircraft that we all expect to happen.

The third thing, which I find somewhat surprising, is that public acceptance of unmanned aircraft is quite a challenge. You have recognised that a number of very important uses of drones have already been identified. According to figures I have seen, the public support the use of unmanned aircraft for Government and public sector use by 80% or 90%, so that is very high, but for recreational and commercial use it is not so much; it is less than 40%. I was surprised to see that retail and food delivery fell from 35% acceptance in 2016 to 16% and 17% in 2017 and 2018 respectively. There will be a challenge for industry and service users, the people who use these bits of kit to deliver their service through the lower airspace. They are going to have a challenge as well on public acceptance. I think the Government have a role to play in that.

Q442 **Chair:** What should Government be doing, if they have a role?

Baroness Vere: The Government can do all sorts of different things. The most important thing is to improve the public's perception, and the reality, of safety. Safety is one of the key elements for unmanned aircraft. One of the challenges we will have is how we are to regulate our lower airspace, by which I mean the very low lower airspace. There are many different challenges.

We have Project Chatham, which is the CAA, NATS and the DFT all working together to create a digital superstructure of relevant information about all unmanned aircraft, relating to airspace and the appropriate



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restrictions. Once we have that, it will be open source, so app users and developers can take that information. On to that, we need to put unmanned traffic management systems, which again are in development—the CAA is involved—tying into that electronic conspicuity, which will be really important. It is about time we knew what is in our skies, particularly if there is to be more of it, whatever “it” is. Linked to that is a registration system.

Those four things together will go a long way to making sure that our lower airspace is safer and that the public feel it is safer, rather than just thinking, “I don’t want a random object flying down my street and nobody knows what it is and where it is coming from. It might be a bit noisy. Quite frankly, it is going to my neighbour’s house and not to me. I don’t like it.” The safety element is critical.

Q443 Chair: I totally understand what you say about the need to remove barriers to enable development of the sector, but sometimes it is more than just barriers. We heard evidence from Amazon about the potential for unmanned craft to undertake final mile delivery. That involves planning rules and so forth. How much are the Government doing to think through the proactive steps that need to be taken to facilitate safe expansion of the technology?

Baroness Vere: We recognise that there are all sorts of barriers and that it is hugely complex. For example, the CAA is doing some good work in this area. It was given £1 million from the BEIS regulators’ pioneer fund. That is looking at innovation and making sure that people who are innovating in this space get the preliminary regulatory guidance that they need even to understand in the first instance which regulations will be applicable.

The second is the regulatory sandbox, which is essentially a place where regulations are taken away and we say, “Have a little go and see what you can test and trial, and then we will have to figure out how we are going to regulate it.” The last is the regulatory lab. That is a working environment where we work with people in the regulatory framework. There is a three-stage process. All of it is ongoing. Obviously, further work is going on in the DFT as well in the drones team as to how all of this is going to interact. Deliveries are not immediately imminent in this country.

Q444 Chair: It is quite close.

Baroness Vere: Amazon did its first in 2016; it made a delivery in Cambridge.

Q445 Chair: We were told that there was a five-year timescale.

Baroness Vere: Absolutely. It is not the next six months but certainly in the next five years. I completely and utterly recognise that. This area of my portfolio is one of the most exciting because it is developing so quickly. We have to be on our game to make sure that we are not holding



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anybody back, and that people are given freedom to develop in the way that is right for this country.

- Q446 **Chair:** We also heard evidence to suggest that the UK was behind the curve—that was the wording used—in terms of the development of regulation on drone use and of counter-drone technologies. I am getting the impression from your body language that you do not agree with that.

Baroness Vere: I do not agree.

- Q447 **Chair:** Can you explain your position? We have heard evidence today about the need for new regulation—for example, being able to impose immediate restrictions, which are not there at the moment, on the use of drones in the immediate vicinity of an air ambulance landing. There are plenty of other examples of where regulations need to be developed.

Baroness Vere: I am not saying that we have a perfect set of regulations that does not need changing at all, but, compared with other countries, we are doing very well in our regulation of unmanned aircraft. If you think back to the changes we made to the ANO 2016, we introduced our registration system back in May 2018. It was over a year ago that we said, “We have to start knowing what is in our skies. People are going to register and do a competency test.”

- Q448 **Chair:** That will come in this autumn?

Baroness Vere: Yes, that’s right. We picked that up quite a long time ago. As you know, Changi airport had an incursion a few days ago, and now the Singaporean Parliament is saying that Singapore needs a registration system. In our case, it was not, “Oh, there’s an incursion; we need a registration system.” We had thought about it in advance. I completely admit that the regulations are not perfect, but they cannot be because the world is moving very, very quickly.

- Q449 **Chair:** How closely are you engaging with other international partners in the development of a framework that will be suitable for the future?

Baroness Vere: Obviously, we look at what our international partners are doing. We are having two main conversations at the moment. The first is with our European partners. We have regulations coming from Europe that are impacting this area as well. Personally, I think our regulations are better, but that is just me.

The second conversation I have had recently is with the Americans. I spoke about this to the Deputy Director of Homeland Security and had a conversation with Airlines for America. I got the impression that we are doing fairly well, but we will work closely with them. That brings me to the second part of your question, which was about counter-UAV technology. That is a hugely important area and one where we are working as quickly as we possibly can.

- Q450 **Chair:** When there was the issue at Gatwick before Christmas, we heard that airports in some other countries were already deploying technology



that we were not. Is that a fair point?

Baroness Vere: It may well be a fair point, but the thing we are going to come up against in counter-UAV technology is that there is no one size fits all. It depends on the appetite for risk for collateral damage; it depends on the primary regulation that allows you to do something or not do something to somebody else's property, or to their unmanned aircraft. All sorts of things have to be taken into consideration.

The way we are approaching this is that our absolute priority is to detect, track and identify equipment. We need to make sure that we test these things as quickly as we can. The Centre for the Protection of National Infrastructure is doing a testing process at the moment. They put out a call to all manufacturers back in January, but we accept equipment all the time. If any new equipment is developed, it develops very quickly.

Testing is ongoing and quite complicated. It has to be tested in lots of different environments on lots of different types of drone, because not all unmanned aircraft are the same. We expect to have a batch of solutions published in September. It will not be, "Here's a list; you have to have it." It will be, "Here's a starter for 10; there will be more coming." It will be an ongoing process, so, once a manufacturer is on the list, it will be on the list for probably two years, unless significant changes are made to that particular technology. Airports will then be able to look at that and have a degree of comfort that those things have been tested.

Some have already gone ahead and purchased or leased various bits of equipment. It depends on the airport. Is it urban? Is it rural? How close is the nearest building? A lot of airports have already done an analysis of where the most likely launch sites are and where they want to deploy their capabilities. It will never be one size fits all, but the Government do what they can to test the technology that is coming through.

Q451 **Bill Grant:** We heard this morning about the rapid advances in technology and innovation in the use of drones. Do you feel that your Department is ahead of the curve or behind it? I note that you said you have done some good work that will come out in two or three months' time. Are you in a catch-up phase, or are you content that you are operating as fast as the industry is operating?

Baroness Vere: I think the latter in terms of the mainstream part of the sector. There will always be things that are ahead, because they may or may not work. They will be the first movers who might move into a new sector, but I feel that we have a good understanding of where we are. We are working very closely across Government in responding to the different challenges produced by unmanned aircraft. For example, we are working very closely with the Home Office on the unmanned aircraft Bill. It is pretty much ready to go, and we are just looking for parliamentary time. That will be a very important filler between somebody committing an offence and being convicted of it, because that is very important. I promise I will shut up in a second.



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The second really important thing, also working with the Home Office, is the counter-UAV strategy. I admit that historically sometimes we have focused on the risk to airports, because that is where the risk was first of all, but back in 2014 drones were being flown over nuclear power stations. We have to understand that counter-UAV strategy is not just about airports; it is about all sorts of infrastructure, and we are working on that with the Home Office.

Q452 Bill Grant: Maybe there is a slight weakness in the current regulations. There are restrictions on drones operating beyond line of sight, as they say. Is the Department minded to adjust those regulations to get a balance between risk and allowing the industry to develop? They could prove to be quite restrictive. We need to harness and capitalise on the opportunities that drones and new technology bring. I think you touched on that. What would the restrictive element be? Are you minded to ease that going forward?

Baroness Vere: That is a very important point and a very important part of what unmanned aircraft can do. Essentially, they do jobs that are too dull, too dirty or too dangerous for a human to do, which I think is a great description. Beyond visual line of sight is a very important thing, but, for example, if you want to look at a train track going off into the distance, you can get an exemption. Getting an exemption is not rocket science. You make an application to the CAA, pay your £253 and you get an exemption that lasts a year. We understand that there are about 500 renewals for all sorts of permissions every month, and 210 initial ones. In general, it seems to me that the industry knows what to do to get exemptions.

It is important that the restriction on beyond visual line of sight remains. We cannot have people not knowing what they are doing and flying off into the distance and not being able to see. If they know what they are doing, fine.

Q453 Bill Grant: Is the Department comfortable that the exemption element allows the industry to progress further into that sphere of operation?

Baroness Vere: Yes, because the CAA already has a system to allow the industry to do that. There are nearly 5,000 commercial drone operators registered with the CAA, so we know that the industry is fairly significant.

Q454 Bill Grant: They know about the exemptions, so it is fine?

Baroness Vere: Yes. I have not heard of anybody complaining that they did not know they could get an exemption.

Q455 Bill Grant: You have a happy industry?

Baroness Vere: Of course we do.

Q456 Stephen Metcalfe: We heard from the previous panel that the airspace is getting more and more crowded with both manned and unmanned aircraft. One of the suggestions we heard was that everything in the air



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should have a transponder fitted to it. I would be interested in your views on that.

More widely, as the airspace gets more crowded, we need to look at how we manage the traffic. I think the Department for Transport was involved in Operation Zenith, an air traffic management system trial organised by National Air Traffic Services at Manchester airport.

Baroness Vere: There are loads of them.

Q457 **Stephen Metcalfe:** What was your view of that trial?

Baroness Vere: Turning first to electronic conspicuity, we believe it is a very important development. It is the case at the moment that pilots have to look out of their windows like mad. I cannot see that that is any way to develop our airspace going forward. We have to have electronic conspicuity. It was in our Aviation 2050 consultation. We have had about 850 responses, nearly 900, and we are going through those because many of them are very well considered and provide valuable feedback to us. We will look at how that progresses, but it is my view that, all other things being equal, unless there is a particular issue brought to our attention, both manned and unmanned aircraft should be conspicuous in future.

Q458 **Chair:** What is the timescale for responding to that consultation?

Baroness Vere: By the end of the year, so we have a lot to do this summer.

Turning to Operation Zenith, I looked at you blankly because I had not heard of it before. I am going to be frank. There are lots of different trials going on at the moment. I mentioned earlier Project Chatham. That is the key underpinning for all this. On top of that will be laid various traffic management systems, and we will see which of them works. There are trials already ongoing for traffic management systems within the CAA sandbox, for example. Altitude Angel is doing one, but that is not the only one; there are many others. Once we have the data underpinning it, we will have the traffic management systems on top of it.

Q459 **Stephen Metcalfe:** Who is leading Project Chatham?

Baroness Vere: It is CAA, NATS and DFT.

Q460 **Stephen Metcalfe:** In terms of action that the Government are taking to reduce the risk of unmanned aircraft, as opposed to manned aircraft, do you think we are progressing with those trials at the same speed as the potential risk or threat grows?

Baroness Vere: We are progressing with the trials as fast as we can. This is a hugely complicated area. We are not just talking about new drones—the new-fangled rotary-powered drones in the sky. We are talking about fundamental change to our airspace, which has not happened for 50 years. We have to combine everything we are doing around unmanned aircraft because essentially, as I think you raised



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earlier, manned and unmanned aircraft should not necessarily be treated differently. We have to make sure that we know where they are in terms of conspicuity, and we have to make sure that the airspace and its management are appropriate for all the different types of aircraft we will be seeing.

Q461 **Stephen Metcalfe:** Is there anything else the Government can do at this stage, or do we wait for the outcome of the trials?

Baroness Vere: It is not a case of waiting for the outcome; we are actively progressing all these different things.

Q462 **Stephen Metcalfe:** Yes. You talked about bringing forward the unmanned aircraft Bill later in the year. How far has work on that progressed? Is it worth waiting until we have completed our report, for example, to inform that?

Baroness Vere: The unmanned aircraft Bill focuses on powers. It plugs the gap that the police have told us they feel exists at the moment. The registration system comes in at the end of November. The unmanned aircraft Bill will make sure that there are appropriate offences for not being registered. It will include stop and search. At the moment, a police constable cannot stop and search somebody if they suspect they have committed an offence with an unmanned aircraft and shoved it in their bag. We need to fill that particular gap. It covers entry to a house looking for a specific unmanned aircraft—all those sorts of thing.

There are other things relating to prisons. Obviously, the use of unmanned aircraft around prisons is an issue. There are already offences, but it is the gap between commission and conviction where there could be a bit more help for the police. That is what is included in that Bill. Hopefully, your report will be out before the Bill hits the Houses, so we will be able to include anything additional.

Q463 **Stephen Metcalfe:** We have had some evidence about the current system for requesting access to flight restriction zones. I presume that is where a drone, or unmanned aircraft, wants to enter restricted airspace for legitimate reasons. The system to make that application is fragmented and not as unified as perhaps it might be. Is any work being done on that?

Baroness Vere: Yes, there is. We have two problems. Fragmentation also means localised and that is the issue. Flight restriction zones could be at Heathrow airport or an airport that has five flights a day, so we have different elements. It is up to the local air traffic control unit to provide permission. If that is not working because there are only five flights a day, it is down to the aerodrome.

We are aware that there are differences. The CAA has given guidance to all aerodromes about giving permission. It is reviewing all FRZs this year and the permissions being granted. We recognise that as a potential



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issue, but we have to balance it with the particular aerodrome that is being asked to do something.

Q464 **Chair:** To return quickly to Operation Zenith, I totally understand that you are not able to comment on it now, but it is the codename for a programme of live demonstrations of the integration between air traffic control and unmanned traffic management, and is based at Manchester airport, as Stephen said. A lot of people have said that we have to develop that integration. Could you send us the Government's assessment of the operation of the trial, and whether there is a plan to roll it out across the country? It would be really helpful if you did that.

Baroness Vere: Of course. No problem.

Chair: Thank you.

Q465 **Bill Grant:** On a previous panel, we had Special Sergeant Kevin Taylor, a police drone operator. He was very enthused about the new role and the issues about countering the malicious use of drones. If anybody onboard an aircraft is behaving badly and puts at risk that aircraft and its passengers, society takes it seriously, yet if externally somebody operates a drone maliciously around an airport, not unlike Gatwick, it is a summary fine.

Baroness Vere: No.

Q466 **Bill Grant:** According to the police sergeant it is. I am making a comparison. For onboard activity you end up in jail, quite rightly so, if you endanger an aircraft and its passengers. Perhaps I can read what the special sergeant said. He told us that a breach of the air navigation order is "a summary-only, low-level offence, dealt with basically by fine." Surely, the risks are equal. If you are going to take down an aircraft from onboard or externally, the offence must merit severe punishment. That would appear not to be the case.

Baroness Vere: I would hate to disagree with the police sergeant, but I am going to.

Q467 **Bill Grant:** Fortunately, he is not here.

Baroness Vere: He is not, so I am slightly going to. He might have been asked a slightly different question. If there is intentional use of a device to endanger an aircraft at an international airport, the sentence is up to life imprisonment under the Aviation and Maritime Security Act 1990. Recklessly or negligently causing or permitting an aircraft to endanger any person or property is dealt with by an unlimited fine and up to two years' imprisonment. For recklessly or negligently acting in a manner likely to endanger an aircraft, or any person in an aircraft, the sentence can be up to five years' imprisonment. The sentence can be up to life imprisonment. If you go to Heathrow and fly your drone around and endanger an aircraft, you risk life imprisonment.

Q468 **Bill Grant:** The information we were given about the use of drones may



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not be accurate.

Baroness Vere: There are many other—

Q469 **Bill Grant:** It is about the burden of proof. I dare say it comes down to that as well. Was the drone really a danger to the aircraft? Your Department is content that it is sufficient?

Baroness Vere: We are content at the moment, but we are not content with the issue, because we believe that the stop and search power and the powers of entry are needed, not only to act as a deterrent but in investigating further drone sightings as they occur. That is where we are missing stuff.

Q470 **Bill Grant:** Is your Department engaging with the police to counter drone activity? We saw the disaster at Gatwick—the time, the cost, and the inconvenience. What engagement do you have with the police and others on effective systems to counter the malicious use of drones? Are you helping the police, or is somebody else giving them a wee bit more assistance?

Baroness Vere: Obviously it is an ongoing process, but there are established protocols. The DFT, the police, the Home Office and the CAA work together. Each airport is different, so each airport has a different protocol. We have done revised guidance, or the CAA has done revised guidance, for the airports, which are now putting that in place in terms of their roles and responsibilities to react to any incursion, and they are updating their training programme to make sure of that. I went to Heathrow the other day and saw their desktop exercise; they have a big sheet that shows that, if a drone incursion happens here, this is what happens there, with a big grid. Whereas many years ago that would not have been thought of, now there is not an airport in the country that has not thought about it, spoken to their local police and come up with a protocol.

Q471 **Bill Grant:** The appropriate agencies are working together to counteract the incursion of a drone?

Baroness Vere: Yes. Basically, it is the DFT and the CAA sitting slightly to one side providing guidance, but the big relationship is between the airport and the local police.

Q472 **Bill Grant:** You might be limited in your reply, but are we content as we speak today that, in the event of something similar to the Gatwick incident, it could be brought to an end sooner, to allow people and aircraft to move about as they should? Is Gatwick ever going to happen again, or are you confident that we can bring such an incident to an end sooner?

Baroness Vere: All I can say is that I hope so. The problem is that each incursion is different, and that is the issue.

Bill Grant: I have one final question.



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Baroness Vere: You can ask as many as you like.

Q473 **Bill Grant:** You said that the protocol was different for each airport, because there are different volumes of aircraft movement, and those things vary between airports. But shouldn't there be a standard protocol throughout the UK, through the CAA?

Baroness Vere: No, because the other issue is that each airport is different. Some are in rural locations and some in urban locations. Their counter-UAV technology will be different, depending on what they feel is the best for their area. Obviously, the guidance issued by the CAA is standardised, but each individual airport then reacts to that guidance and says, "This is how we will react."

Q474 **Bill Grant:** The individual airports decide what counter system they want to secure?

Baroness Vere: They can, and when we have our list that comes out in September those will be the ones that are approved per se, but not mandatory. There is one very important thing to point out. Airports do not compete on security, so they share best practice really well. There is no advantage in trying to compete on security. In particular, the ones with the greater amounts of capital, such as Heathrow and Gatwick, are very good at sharing with other perhaps less well-endowed airports.

Q475 **Bill Grant:** To quote a BALPA captain, every flight should be a safe flight.

Baroness Vere: Exactly. That is what we want.

Q476 **Chair:** Going back to Special Sergeant Taylor, if I may, there was a discussion about the need, as he and other witnesses saw it, to have strict compliance with restriction zones around airfields. Captain Pottage from the pilots association said, "We were asking for it to be treated in the same way as reckless driving offences are considered. I believe we requested a fine of up to £5,000." He was saying that it needs to be very strictly enforced, with rules about the restricted zones around airfields.

Special Sergeant Taylor said: "Breach of the air navigation order is a summary-only, low-level offence, dealt with basically by fine. Our successful prosecutions have been based on cautions as a result. Aircraft endangerment, which is extremely difficult to prove, is the one that becomes triable." That is what you were talking about. He goes on: "We have spoken to the CAA about doing that in relation to a couple of situations we have had in Lincolnshire. It is extremely difficult. You have to be able to prove categorically that the aircraft was endangered, not just that somebody was flying close to an airport. Flying close to an airport with no aircraft taking off or landing would not be considered by the Civil Aviation Authority to be endangering an aircraft if there isn't one to endanger. Those are the challenges."

Basically, they are saying that we need to take it more seriously and get the message out to everyone that if people breach restrictions around airfields, because of the potential catastrophic consequences, even if we



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cannot prove in an individual case that an aircraft was endangered, we have to up the penalties. That, in a sense, was the point that Bill was putting to you. Could you respond to that?

Baroness Vere: I would hate necessarily to disagree with the police sergeant.

Chair: But you are going to?

Baroness Vere: We are slightly early days in this. What I would not want to do is start messing around with the state of the current law when there has not been enough challenge to it. For example, earlier this year, in January, a chap was flying a model aircraft near Heathrow. He got a £2,000 fine, and they took his model aircraft away and smashed it up. That was appropriate. He was 500 metres away but he was breaking the flight restriction zone. Within the air navigation order, there are a number of offences that people are being convicted of at the moment. They are the article 94-type offences, and they tend to result in fines. To a certain extent, that is all right.

Q477 **Chair:** You are satisfied with the penalties as they stand?

Baroness Vere: I am satisfied at this time. However, recklessly acting in the manner we were discussing earlier is also in the air navigation order, in articles 240 and 241. We are in a situation where, although a number of airport incidents have been reported, further development of the legal framework may not yet be needed, because we still have the ultimate one, which is life imprisonment.

Q478 **Chair:** But you do not think that, as the special sergeant felt, we need to send out a very clear signal to people that flying within restriction zones of airfields is a non-starter, because of the catastrophic potential consequences of what could happen?

Baroness Vere: I do not think you send out a very strong signal to people just by upping and upping and upping the number of years in prison, or the size of the fine. The reality is that it must be a communication and education exercise by Government and the police. Indeed, that happens. I do not know whether you saw that Merton police tweeted, just before Wimbledon, "Don't do it—don't fly unmanned aircraft over Wimbledon. You're not allowed to." It is up to all sorts of different people coming together.

When Extinction Rebellion were planning their incursion, I was clear in the media, saying that it is up to life imprisonment. That is how we make sure that people understand that it is a very serious offence, not by suddenly changing a maximum fine of £2,500 to £5,000. I do not think that will change anyone's mind at all. We have to say, "Look, if you do this, it will be treated very seriously indeed, and you could go to jail. Just remember that."

Q479 **Damien Moore:** The Committee has received evidence that current



drone detection, identification and defeat technology is insufficient. What will the Government do to improve those technologies and protect the UK from criminal drone users? Drones are used for different crimes. The obvious ones are delivering drugs, knives and things to prisons, but there is also hacking, burglaries and all those kinds of thing. What do the Government have planned to defeat those different types of crime?

Baroness Vere: That is a really important point, and one we have touched on a little bit already, with the detect, track and identify work that the CPNI is doing. That is not just for airports. It is for prisons and for everybody who might want to know what is in the sky, how they are going to identify it and figure out where the controller is, and all the things we can do. That is in process, as I have already said.

We are also working very closely with the manufacturers of effector technology; effectors are the stuff that can actually do something about the drones. Am I delighted with the development of effector technology? No. Nobody is. But, again, it goes back to the fact that an unmanned aircraft can look like all sorts of different things. It does not have to be white and in a box with four rotors at either side; it can be all sorts of things. Therefore, developing a one-size-fits-all effector technology is probably not going to happen. However, what is happening is that, by working closely with the manufacturers, we are able to understand better. It is not in the manufacturers' interests to have their products doing things that are illegal. We are working closely with DJI, for example, which already has a competency test in its new drones, before they are allowed to take off.

There are lots of things we can do. In effector technology, we are looking at various effectors. Some of them have been deployed around airports, and the military has some as well. They can be all sorts of different types, whether straight kinetic or other ways of interference. I cannot go further than that.

Q480 **Damien Moore:** Okay. Would the Government make electronic identification of drones mandatory?

Baroness Vere: We intend to.

Damien Moore: That was straightforward. From November this year—

Q481 **Chair:** Do you know what the timescale is on that?

Baroness Vere: The European regulation is effective from July 2020, next year. It is in our books, and it is effective from July 2020. No. Hold your horses, I've got that wrong. It is the delegated Act that has that in. It is in our rulebook now, because it is the delegated Act. There are two of them— a delegated Act and an implementing Act. It now has a three-year transition. Across Europe, there is a three-year transition for all drones.

Q482 **Chair:** Electronic identification of drones will be mandatory from when?



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Baroness Vere: There is a three-year transition now for the manufacturers.

Q483 **Chair:** When did that three years start?

Baroness Vere: I think it was 1 July.

Q484 **Chair:** This year?

Baroness Vere: This year, yes. It is an EU system.

Q485 **Stephen Metcalfe:** On the retrospective aspect, what about all the drones that are already out there?

Baroness Vere: I don't know.

Q486 **Chair:** Can you come back to us on that?

Baroness Vere: I will come back to you on that. We will have to have a consideration as to whether they can be retrofitted. Part of the consultation is whether things can be retrospectively fitted with a beacon to make them conspicuous.

Q487 **Stephen Metcalfe:** Realistically, if you have paid £50 for a drone, you are not going to go into getting it retrofitted with some tracking device.

Baroness Vere: We will certainly consider that. It will be in our consultation response.

Q488 **Damien Moore:** From November this year, all drone operators using drones of over 250 grams will be required to be registered. Why was 250 grams used as the threshold?

Baroness Vere: Because that is the size of drone above which it can carry a payload, particularly a camera. It is also used as a threshold by the EU. We are content at this time; it may be that we will amend it in future, but it was felt that that was the right weight.

Q489 **Damien Moore:** As the technology for other things that could be attached to drones develops, it will be smaller and lighter. It will be ongoing?

Baroness Vere: Yes, and we may have to look at that again. But, at the moment, we are content that between 250 grams and 20 grams, we are covering the vast majority of the market we are trying to get to, which is the stuff that can carry cameras or payloads.

Q490 **Damien Moore:** The Committee was told by the CAA that a drone operator must be registered, and that operator is then able to oversee remote pilots. That would mean, hypothetically, that the head of a drone association could register themselves and a large number of remote pilots, while incurring only a single fee of about £16. A single drone user, however, when registering as a drone operator, would also have to pay £16. Is that correct, and is it fair?



Baroness Vere: Ah, the model aircraft associations.

Chair: They are in the room, so be careful.

Baroness Vere: No, no, that is absolutely fine. They know precisely what I think, because I had the pleasure of meeting them. We have the UA Bill coming forward, which will mean that operators of UAs have certain roles and responsibilities under the law. As I said to them, if they then want to be responsible for all their members as remote pilots, they should think very carefully about that. It is the case that there will be either fixed penalty notices or things that are a lot more serious.

Q491 **Chair:** Legal liability would attach to the club?

Baroness Vere: Yes. You have to slightly think through this. What is the point of the registration system? If somebody's unmanned aircraft crashes to the ground—whether fixed-wing or rotary, I don't really care—what do you want to know? You want to know whose it is. If it has a number on it that is just for a club, how am I going to know whose it is? It strikes me that that means that the system would not work as we want it to work.

In order to make that system work, you would have to go to the club and the club would have to try to find out whose it was. Then what is the club going to do? When a new member comes to that club, is the club going to vet that member, look through their social media and make sure that they are a good guy? The challenges of that way of operating are many.

I say to the model aircraft associations that I absolutely respect their position as people who care deeply about safety, and the safety of our airspace. Therefore, if that is the case, why would they not wholeheartedly support a registration system that we feel would improve the safety of our airspace, not just for model aircraft but for everybody flying any sort of aircraft in the sky?

Q492 **Chair:** There will be individual registration? Is that the plan?

Baroness Vere: Yes, because otherwise it cannot work. However, the point about the remote pilot is a very good one. We are very happy with the remote pilot. Somebody who has a multitude of model aircraft can apply to be an operator. They just have to pay once, and that is absolutely fine. They have lots of aircraft, and they can put the same number on their aircraft, because they are all there. There is no problem with that at all. If their 16-year-old son wants to have a go as a remote pilot, we are absolutely fine with that; the remote pilot can be the son operating, but, obviously, somebody has to have responsibility for that particular aircraft.

That is how we see the system working, and we think that is fair and future-proofed. Again, we do not know where this is going to go, so it is really key that things are future-proofed. Eventually, when we have our registration system, electronic conspicuity, our unmanned traffic



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management system and Project Chatham all working—if you follow me—we have a system that will work. If somebody puts a drone or an unmanned aircraft up in the sky with a beacon on it and it is beeping, and that drone is not in the registration system, we will be able to say, “What’s going on there?” That is quite important.

Q493 Damien Moore: That’s the key thing, isn’t it? The head of an organisation is taking a huge risk if they register all that to them, because it is not the club. It must be to the person. You do not know whether people will do things criminally, intentionally or otherwise. That in itself would be a huge risk for them, and not best practice from which to work.

Baroness Vere: I agree. I am just slightly saddened about what I think is very reasonable sum, at £16.50. It was consulted on and it could be more or less, but it is going to be around £16.50. There is a competency test, which I am fairly sure that anyone who flies a model aircraft will fly through, so to speak.

Another thing to recall is that the changes to the ANO that brought this in were made back in May 2018. My Department and the CAA have received a huge number of individual letters about it, yet the change to the ANO happened over a year ago. The only thing being consulted on at the moment is the cost, which is such that the system wipes its face. That’s all. It is just to make sure that you and I—I am not a model aircraft or drone flyer—do not as taxpayers have to pick up for somebody else’s hobby, which I think is fair.

Q494 Damien Moore: Absolutely. What is the Government’s position on making inbuilt safety features, such as geo-fencing, a mandatory requirement?

Baroness Vere: They have just become so. In the EU regulations that came in, and the delegated Act that came in in July, along with electronic conspicuity, there is also geo-fencing. Again, there is a three-year transition period, but it will be very helpful. To be fair, many unmanned aircraft already have geo-fencing, but making it mandatory is very helpful, particularly as Project Chatham and so on all come in. Then what will happen is that drones literally will not go in the places they are not supposed to go to, which will be very helpful for everybody.

Q495 Chair: When does that happen?

Baroness Vere: That is with the three-year transition period, which is for geo-awareness, electronic conspicuity and noise limitations. We have not really discussed noise and drones, but there can be an issue, particularly if they become more prevalent in our skies.

Q496 Stephen Metcalfe: You have painted a comprehensive picture of how, in future, when all the parts are in place, we will have this fantastic system whereby, when one plane—sorry, unmanned aircraft—is beeping away, we will be able to pinpoint it and say, “What is that, what’s it doing,



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where's it going and does it present a risk?" But it sounds as if that complete, comprehensive system is some time away; it is not going to suddenly appear, because there are a number of trials and things need to be put in place.

How do we raise awareness among the public now of some of the risks that drone operation presents? If something were to happen, and we cannot find the beeping plane that in future we will be able to find, and it lands and does damage to a sports event or a concert, something truly malicious, what will the Government's response be? Will it be to say that we have been working on it? Do we need to increase the speed at which we do this to match the speed at which drone use is growing?

Baroness Vere: I think we are working as fast as we can already. Education is an absolutely critical part of what we are doing at the moment. The CAA is leading on the drone code, which is basically advice on how to fly what they call a drone and I prefer to call an unmanned aircraft, safely and responsibly. Awareness of the drone code has gone up from 54% in 2017 to 71% in 2018. I do not have the figures for 2019.

Q497 **Stephen Metcalfe:** Among?

Baroness Vere: Among drone users. The second thing is the Dronesafe website and the Drone Assist app, which I have in a nerdy kind of way downloaded to my iPhone and had a look at. It is very good. It shows you where the flight restriction zones are; it will tell you, "No, you can't fly here." It is a very useful piece of kit.

The CAA gets out among the flying community as much as it can to promote things such as the drone code and Dronesafe. It will go to Duxford and various other meets over the summer to help people to understand. We are working with clubs to make sure that they understand what is out there. We have a very good partnership with Jessops, which sells a lot of those sorts of drone. We are sending in unmanned aircraft specialists to deliver training to the employees of Jessops to make sure that, when someone buys a piece of kit, they know what they are taking on.

The competency test that will be required for all operators or remote pilots from November will have the basics, and probably a little bit more, that people need to fly an unmanned aircraft responsibly, such as knowledge of airspace regulation and general knowledge about unmanned aircraft. Then there is something called human performance limitations, which is basically about flying in fog and stuff like that, beyond visual line of sight, and all that sort of stuff. There are also privacy and security issues; some of those things need to be considered. It will be the case that education is very important, which is why the competency test is so important and why everybody needs to take it.

Q498 **Stephen Metcalfe:** The registration system comes in in November?

Baroness Vere: Yes.



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Q499 **Stephen Metcalfe:** It is going to be £16.50?

Baroness Vere: That is what is being consulted on. It will be there or thereabouts.

Q500 **Stephen Metcalfe:** If you choose not to register, will you be committing an offence?

Baroness Vere: Yes, you will, when the Bill comes in.

Q501 **Stephen Metcalfe:** Will the offence be the ownership of an unmanned aircraft or the flying of an unmanned aircraft?

Baroness Vere: Obviously, at some point the police will have to take a little bit of a pragmatic view that, if you have a drone underneath your bed that is covered in dust and is not actually registered, it is probably okay.

Q502 **Chair:** But the actual offence is owning a drone without registering it?

Baroness Vere: It is failing to be registered as an operator of a drone. I do not have the wording with me, unfortunately.

Q503 **Chair:** Perhaps that is something else that you could cover in writing.

Baroness Vere: Of course, no problem. The offence will be that you did not register as an operator, and it will probably be a fixed penalty notice. What we are not trying to do here is to over-criminalise people; that would be foolish. It is more about giving a slap on the wrist, a bit like giving a parking ticket, for a first offence: "Look, you should have registered your unmanned aircraft. Go and do it now, and, by the way, here's a fixed penalty notice. Don't do it again."

Q504 **Stephen Metcalfe:** I have had contact from model aircraft flyers or pilots who feel that they have existed perfectly happily for up to 100 years, and there are no examples of malicious or dangerous use, which you may wish to contradict. They feel that they are not being awarded the respect that they deserve as a community that has been in existence and operating very safely. First, can you address the bit about whether there have been any incidents? Secondly, is the only barrier to them the cost? Is that the only reason that they say they are unhappy with this proposal?

Baroness Vere: To take your second point first, I am not going to speak for them as to why they are unhappy. Of course, we completely respect the fact that it is a very long-standing, traditional hobby, but even though it is a long-standing and traditional hobby, it is still putting objects into the sky, and I cannot reconcile in my head why it should be different for somebody who undertakes a new hobby with a similar but slightly different aircraft. I cannot reconcile why they should be treated differently.

People will say that they have a good safety record. Sure. I expect the vast majority of all unmanned aircraft users to have a good safety record,



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because they will have done the competency test and will be well educated. I do not expect that we will have hundreds of thousands of troublesome flyers out there. I referred earlier to the case in January this year when a chap was fined £2,000 for flying his model aircraft near Heathrow.

Q505 **Stephen Metcalfe:** Do you know if he was part of a club?

Baroness Vere: I couldn't possibly comment, but I understand that might have been the case. It might have been the case or it might not have been. There are conflicting views.

Q506 **Chair:** In the first panel today, we heard from Gemma Alcock, founder of the SkyBound Rescuer Project. She said that, if people are buying from some of the specialist places, they will inform those people of their responsibilities. You are working with Jessops, for example. But she has a concern that in other high street outlets the sales staff may have no idea about the rules surrounding this, what people should be doing, the fact that they need to register and so forth. Are you doing anything to ensure that every retail outlet gives the necessary information to purchasers on a voluntary basis, or is there anything that actually mandates them to do so?

Baroness Vere: Can I write to you on that? I would like to go beyond the work that we are doing with Jessops. I am fairly sure that we are speaking to other high street retailers. If I can provide you with the information in that way, it would be much appreciated.

Q507 **Chair:** It would be very helpful. And could you address the specific question whether you have decided to adopt a voluntary approach, or whether you think that actually there needs to be some mandation—that, when someone is selling a drone, they must inform the purchaser of certain things?

Baroness Vere: Of course, that would have to be for all unmanned aircraft, whether rotary or not, and online, too. That is another issue, as I know that a lot of model aircraft are sold online.

Q508 **Chair:** Understood. Thank you very much indeed. We appreciate your time.

Baroness Vere: You are very welcome.

Chair: Thank you.