Presentation to Transport Canada 16 August 2017 – Halifax – Edited for clarity Dec 2017

As an introduction I will let you in on some of my Model Aviation background. I have been flying rubber powered, fuel powered, electric powered and gravity powered aircraft since the early 1960s. My first model contest was in Windsor Park flying control line around 1961 or 1962. I continued to fly Control Line and rubber powered through my teen years. As an adult I took up RC flying in the early 1980s. I have been building and flying Model Airplanes a long time. I have built many airplanes in that time. I have crashed a few. Others have just been worn out. I have worn out glow engines. I have discarded oil soaked planes after literally hours of flying time. In a direct contradiction to assertions in the Canada Gazette about the number of planes that were lost by flying away after loss of control, I have only lost one. I know where it is. I have not been able to find it in very deep hard to get at, woods.

With respect to the proposed regulations, I am appalled at, what appears to me to be, the lack of knowledge and understanding by Transport Canada of what model aviation currently takes place in Canada and the range of aircraft and their frequency of use.

I have been trying to digest the impact of the proposed rules on Model Aviation. The rules seem to have been drawn up by an organization whose intent is to destroy Model Aviation.

I read the weight classifications and feel that it is a clear case of what I refer to. In full size aviation Transport Canada regulates licensing, operation, training, maintenance and fees as a function of aircraft size, type and role. Full size aviation does not lump a Cessna 172 in the same operation class as a Q400/Dash 8. But in Model Aviation you have done that very thing. You contradict your long standing recognition of those principles.

I say this because the MTOW of a Cessna 172 is about 1100 Kg or 2450 pounds. The MTOW of a Q400 is about 65,200 pounds or 29,500 kg. They have about a 26 to 1 difference in MTOW. The regulations applied to these two examples are very different.

However that 26 to 1 weight range is very nearly the same as the 1kg to 25 kg weight limit you have applied to Model Aviation. It is irrational and inappropriate and grossly unfair to apply a dramatic difference in rule making principles to model aviation, which you do not apply to full size aviation.

I would suggest that the rational weight ranges should be 251g to 1500g, 1501 to 3000g, 3001g to 5kg, and above 5kg to 25kg. Those proposed rules you currently suggest should only apply to the 5kg to 25kg weight class. There is little or no justification of the large weight range being proposed. It violates long standing regulatory principles. The rules proposed for the 1kg to 25kg should not be applied to models up to 3000g. Above that weight modification of the rules is still essential.

As one of the Issues identified in the proposed regulations you identify the safety of persons and property on the ground. This is a rejection of the long standing principle of rules being based on risk, as measured by frequency and severity of accidents. This proposal is not supported by the facts. There is no litany of events, nor documentation that supports that finding of a need to protect persons or property on the ground. In fact the opposite is true. Attached is a 195 page report that shows the risk of injury is quite low. This suggestion of limiting damage to people and property on the ground is very much Fake News, similar to another governments claim of an “increase in unreported crime”. That was ridiculed by the current government just as the current rationale should be ridiculed by all who read it.

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Full size aviation presents a greater risk to the population on the ground than does Model Aviation. Within days of The Minister's announcement of the interim rules, in March 2017, 2 General Aviation aircraft collided and crashed to the ground. The death toll, the injuries, and the financial impact of that single incident, is more than all combined Model Aviation incidents in the past 5 years. In fact I would suggest it might be the last 10 years.

The Minister and Transport Canada has not proposed radical changes in General Aviation rules to protect the public and property from this tragic event repeating. In fact they have been distinctly silent on the event. I won't suggest it, but some would argue that this should be regarded as hypocrisy at its' finest. If you will not take steps to limit General Aviation in the same manner that you are applying rules to Model Aviation, then I feel that your actions are gravely discriminatory. This failure may also expose Transport Canada and The Minister to litigation by your abandonment of those long standing, underlying principles in proposing to apply such rules affecting Model Aviation.

It is also apparent that those persons creating the rules, appear to have little or no operational experience in the Model Aviation field. This is evident by suggesting, what appears to this writer, to be irrational and illogical speed limits based on where flying is taking place. In one section you suggest a speed limit of 29 mph for aircraft under 1kg. I have a fleet of fuel powered small planes that weigh around 500 grams that have aileron and elevator controls. Their speed is typically in the 35-50 mph range. Any person who knows and understands Model Aviation would not have made such a speed suggestion. In another area operation is 'permitted' if speed is less than 11 mph. There are a few indoor class airplanes that can fly at those slow speeds, maybe. Safe control outdoors requires planes with an ability to penetrate even slight breezes. The speed limit listed does not appear to make sense.

In the area of proposed costs, Transport Canada and The Minister again demonstrate an utter lack of understanding. Suggesting that a fee of $110 be paid for each new UAV acquired is nonsense. I scratch build many of my planes for $25 to $50. I am not and will not be prepared to pay $110 to register a plane where the fee is many times the cost of the article. Most Model Aviation enthusiasts have 10 plus planes and move planes in and out of their fleets with surprising frequency. To suggest such a fee is irrational and impractical. It reinforces the widely held belief that full sized aviation proponents within Transport Canada, are trying to force the end of Model Aviation. Such actions and proposals certainly confirm that belief to many.

The other matter of costs has to do with the "Administrative burden increase and reduced service standard". The statement says that there has been an increase in non recreational use of Model Aircraft. The non recreational use has no impact on recreational use of Model Aviation. Adding burdensome regulations to recreational use just exacerbates the burden. The proposed rules are a real burden on Model Aviation. They are not necessary. Transport Canada proposes to move that burden to Model Aviation to reduce the administrative burden on Transport Canada that supports the commercial sector. Adding more rules, reassigning individuals to support the Model Aviation "administrative burden" is not necessary. Don't make up useless overbearing inappropriate rules. You cite the qualitative benefits of reduced risk of incidents with full size aviation. There is little or no evidence that there is a change in the risk of incidents. What there is evidence of, is that Model Aviation will be devastated by the new rules. Transport Canada is creating their own administrative burden.

It also contradicts license fee requirements for other recreational pursuits. The same Transport Canada that is proposing such fees on relatively low cost model aircraft, makes pleasure boaters pay NO fees for the registration of pleasure boats that can cost hundreds of thousands of dollars.

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The discrimination between Urban and Rural is another stark contradiction. If the threat is to populations on the ground, effectively the proposed rules say to Rural populations that you are not as valuable or important as Urban persons. Models can be larger and fly closer to you in the Rural environment, but not a City Dweller.

The altitude limits also appear to be another contradiction. It shows a lack of rules for full sized aviation is penalizing the Rural as opposed to Urban flyer. Proposing a lower altitude for Rural flying is a cop out! You blame full size aviation rules or lack thereof for those lower altitude limits. I feel that the real reason is the failure by Transport Canada to regulate minimum altitudes for full size aviation. So it is a story of "Sorry Rural modeler, you can't fly your model as high, because we let full size aviation try to kill themselves by flying slow and in the weeds."

The answer is to immediately implement a minimum flight height rule throughout the nation for full size aviation. This inaction by Transport Canada puts full size aviation at risk unnecessarily. It is not a risk created by Model Aviation. It is a risk created by vested full size aviation interests and a lack of action on the part of Transport Canada and The Minister. Minimum flight altitudes are in effect in almost all other parts of North America, except Canada.

I fly at my cottage in a Rural area. A Bell Jet Ranger repeatedly flies over my property at around 200 feet AGL. I am allowed to fly my models to 300 feet. The colour scheme on this helicopter is such that even with binoculars I am unable to identify the registration. It is dark brown with lighter brown graphics and registration number. It is like the colour of a Tim's coffee with half milk as the background colour, maybe a bit darker. The graphics and registration are the colour of a double double. It is like the low visibility scheme on military aircraft except brown on brown rather than gray on gray. If I could identify the aircraft I would call them or visit them and suggest they shift their route slightly or most sensibly, fly higher.

Transport Canada claims to be serious about safety, and the possible impact of Model Aviation on full size aviation. Many have suggested to me that Transport Canada is not serious. The reason proposed by those persons, is that most of those in the aviation branch of Transport Canada come from one of 2 backgrounds, 1) full size aviation or full size aviation wannabees and 2) a culture of regulation for regulation sake, in other words a culture of bureaucracy.

The result is no regulation that further restricts full size aviation, seems to ever be considered. If Transport Canada are serious about full size aviation safety when it comes to Model Aviation, consider this chilling fact. No Model Aviation pilot, on the ground, is likely to be killed or to suffer bodily harm in a physical interaction between a Model Aircraft and a full size aircraft. So it is imperative that full size aviation stay above the possibility of interaction, or dramatically reduce the possibility of interaction with Model Aviation. The only clear and logical way to do this is to require full size aviation to maintain higher minimum altitudes. I call on Transport Canada to immediately implement a minimum 1000 foot AGL beyond 5km of a fixed wing airport and 0.5 km of a publicly accessible heliport. This makes safety sense. It reduces the possibility of a low flying aircraft interacting with a Model Aviation Aircraft. Both the Model Aviator and the full size aviator, can be dead right in where they are flying. The full size aviator could also simply be dead. This is a reality that the regulators, with their bias, don't seem to understand or accept. The full size aviation community may strongly object to such a regulation.

Welcome to the Model Aviation World. We, Model Aviators, are being asked to accept rules that will effectively destroy our past time. The above proposed minimum flying height for full size aviation

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might extend the past time and the life time, of a full size pilot. That is a pretty easy decision to make. Transport Canada will ignore it.

The height restriction comes about from a few simple calculations. A Boeing 777 approaching an airport wants to be at the magic 3 and 1 number. That is 3 miles and 1000 feet from touchdown. That translates to about a 750 feet per minute descent. On takeoff that altitude can be met by the most anemic of under-powered aircraft within 3 miles. Helicopters can usually hover out of ground effect to altitudes in excess of 8000 feet. So taking off and hitting 1000 feet in a half kilometre of a dedicated public heliport, is easy to achieve for operational helicopters today.

The rules as proposed will not enhance the safety of full size aviation. There is no reported incident in the past 2 years where these proposed rules would have prevented an accident. Full size aviation continues to be able to kill themselves without the help of the Model Aviation community. Controlled flight into terrain, VFR flight transitioning to IFR conditions, lack of currency, lack of experience in type, flight into unfamiliar airports, and poor maintenance of General Aviation aircraft, are the leading cause of death and loss in full sized aviation.

Existing rules more than adequately cover the few verified incidents where Model Aviation flights may have caused an interference with full sized aviation operations. Banning flights of 500 to 1000 gram model airplanes in public parks in big cities is not going to enhance full size aviation safety. Yet that is what Transport Canada is going to do. It is wrong on so many levels.

In Toronto the airports are surrounded by 20, 30 and 40 story buildings within a few kilometres of the airports. Flying a 1 kg foam airplane in a park is not going to put full size aviation, buildings, cars or people at significantly greater risk than they would experience playing sports such as basketball (22 oz), baseball (5.25 oz), softball (7oz), or football (14oz). A 15 year old batter can hit a hardball to about 75 mph or about 120 kph. A high school pitcher can hurl the ball at the batter at about 70 mph. There are baseball diamonds all over the city of Toronto. Cities invest in skate board parks. Greater participation in these activities contribute to rising health care costs. Maybe the Transport Minister should get his Minister responsible for consumer safety to ban the sale of baseballs and bats and skate boards and close skate board parks. All of these combined send more people to emergency rooms in the summer months than they wish to count. The proposed rules are not supported by any comparison with any other sport or hobby activity with respect to Traumatic Body Injury (TBI) or lethality.

In the proposed regulations, an exemption seems to have been proposed for those members of the Model Aviation Association of Canada, known by its' initial as MAAC. MAAC seems willing to accept the regulations without much pushback. I am a member of MAAC. Their stance is not supported by myself. Many other members have expressed thoughts similar to mine. MAAC has an agenda in this just as much as those at Transport Canada. The more the regulations restrict Model Aviation, the more prominent MAAC thinks they may become. The administration of MAAC sees more membership as a revenue stream. The more regulations, the more MAAC may appeal to the flying community.

MAAC appears to have completely ignored the vast number of the general population that fly every day in parks, ball fields, undeveloped industrial sites, cottages, lakes both summer and winter, and over private land with the owners permission. I am one of those persons. I know many others. We will effectively be grounded. If we don't travel many miles to a flying field we are forced out of Model Aviation. The money we spend in the community, the businesses we shop in, the interest we generate

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in aviation will diminish or end. These rules will be the direct and unquestionable cause of this unintended result.

So what can be a solution?

First, hire persons in the regulatory section of Transport Canada who have long experience in Model Aviation and not Model Aviation bureaucracy.

Second, impose a moratorium on implementing new rules affecting recreational use of Model Aircraft,

Third, more clearly define what constitutes commercial use of Model Aircraft and Model Aircraft like flying vehicles. Now it is not well communicated. Having done that create commercial / industrial specific regulations.

Fourth, setup a sensible approach to regulating the commercial sector of Model Aviation. This is a disruptive technology. Established entities, generally do not accept disruptive technology. This may immediately disqualify many at Transport Canada from participating in the rule making. A lot of persons will feel uncomfortable with the disruptive technology. Ask the Taxi industry about Uber. Maybe change or leave should be the mantra of Transport Canada management and The Minister, to staff.

Fifth, start a more comprehensive program to ensure the user community of Model Aviation knows the existing rules. Transport Canada has failed to use the Model Aviation community and social networking to make the rules clear. It appears Transport Canada may have spent more time and money on these proposed rules then they have ever spent on enunciating the existing rules. *The existing rules as they are clearly protect almost all full size aviation.* No further administrative burden needs to be born by the Model Aviation community or Transport Canada. I strongly believe that this is a fabricated issue.

Sixth, impose minimum flight altitudes of 1000 feet AGL, or above the nearest obstruction within 1 km horizontal distance of the full size aircraft, except within 3 km of a full size aviation airport or 0.5 km of a publicly accessible heliport. (The distinction between a publicly accessible and a private heliport is deliberate. Just as a private landing strip in a pasture should not be considered an airport.)

Seventh, start looking at existing research, and funding more research, into the potential risks to objects and people on the ground, before implementing new rules affecting Model Aviation. A very recent paper on the subject (195 pages more or less) is included in paper form along with this presentation. It clearly studies and shows that weight classification determines possible injury. It also clearly shows the distances a test model may bounce or travel after uncontrolled impact with the ground.

Eighth, Transport Canada must be more rigorous in their investigation of reports being made about encounters with Model Aviation by full size aviation. Many of the recent reports are patently false. Again Transport Canada seems unwilling to scrutinize in detail some of these reports, because the possibility exists that, reports as presented reinforce the departments perception and regulatory direction. In other words the reports are accepted on face value because those reports support Transport Canada's. At a minimum Cockpit Voice Recorder and Flight Data Recorder information must be collected as an electronic confirmation of the stories being presented. Some of them are quite creative fiction. Hasn't anyone noticed that reports which were formerly of UFOs and weather balloons are now being reported as UAVs.

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Ninth, Transport Canada has to accept that the number of Model Airplanes and Model Aviation participants is as large or larger than the number of active full size General Aviation participants. This is evidenced by the large numbers of Model Aircraft registered in the United States, prior to the regulation for such registration being rescinded. We are the majority and we expect to be treated with much more acceptance and respect than has been shown recently. We vote. We pay taxes. We write to and talk with elected officials. Persons and groups ignoring us may do so at there political and economic peril. I feel that if these proposed rules are enacted, that there will be a lot of pushback directed to MPs and Senators, way beyond what has taken place to date.

The formal presentation ends here. Attached are many appendices addressing specific items in more or repeated format, as well as enclosed is the 195 page technical paper referred to above.

Contact information

James A. Haliburton
25 Walton Drive
Halifax, NS
B3N 1X6

1 (902) 499-5250

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Appendix A

It has recently come to my attention, that the Air Canada Quality Assurance Dept. has been dealing with false claims of in-flight interactions with Model Aircraft. As many as one false incident per day has been reported. Most of these are not being forwarded to Transport Canada. In fact it may have become a standing joke in parts of Air Canada, as to whose turn it is to make a report today. Transport Canada has not pursued the operators or management, for information the airlines and other operators may have, about questionable or patently false claims of Model Aircraft interactions with full size aircraft.

Failing to require airlines to report all pilot initiated reports is a serious breach of the focus on safety by the agency.

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Appendix B

When the Minister announced interim rules for “Drones” he took pains to say it was to protect the general public from being injured by falling drones. The statement was not supported by any reasonable reference to research or statistics showing this to be a problem.

The reality is that model aircraft present minimal risk to persons or places on the ground. A recent report to the FAA in the U.S. clearly reports that in fact they do NOT present a significant risk to the general public. A copy of that report is included with this presentation.

That report makes the rationale for many of the interim and proposed rules invalid. Therefore it makes the making of the rules invalid. The rules must be revised in light of this real research. The interim and proposed rules should be suspended in the meantime.

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Appendix C

Transport Canada has repeatedly trotted out and the media has reported multiple times the incident of an aircraft “approaching Billy Bishop” having to take evasive action when it encountered a ‘drone’.

This incident shows several areas of great concern about the actions and behaviour or Transport Canada. I will explain.

The actual facts appear to be more complex. The “approaching Billy Bishop” is very misleading. It seems that the aircraft in question was really 55 kilometres away from the airport. You could say a flight to Billy Bishop was approaching that airport when it was still over New Brunswick on its’ way from Halifax.

A lack of specific details serves to mislead the public in a way that supports the faction in Transport Canada that wants more draconian rules on model aircraft.

The other fact that seems to be minimized by Transport Canada, is the fact that the aircraft was at an altitude of more than 3000 metres, or about 10,000 feet.

Finally Transport Canada does not seem to have done a forensic examination or close scrutiny of the pilot report. I will attempt to show you a few calculations which should have caused Transport Canada to have reservations about this incident.

At 10,000 feet or less we can assume a speed of less than 250 knots. This calculation will assume a speed of 200 knots. This speed means the aircraft was traveling about 330 feet per second. This is a distance longer than a CFL football field. The pilots noticed the ‘drone’ and felt that a course deviation was warranted based on the time they had to observe the ‘drone’.

Here comes the questionable parts of the report. If it took 3 seconds to detect the ‘drone’, determine that it was on a converging course, and that it might require a course change the aircraft would have flown over 1000 feet. If a discussion took place between the flight crew, a few more seconds could be assumed. Say now a total of 5 seconds has passed. This means the aircraft has now flown 1600 feet or 5 football fields.

If we assume this was a ‘drone’ of a multi-copter type, we now have to assume the flight crew has much better than 20/20 vision. In other words, the ‘drone’ was not visible, at the calculated distance, to more than 99 % of the general population. Only someone with vision approaching 30/20 or 40/20 could see a drone at that distance and make an accurate determination of what it was and what was the threat.

It does not appear that Transport Canada requested the cockpit voice recording if one was available on the aircraft involved. Such a request and the above simple speed and time assessment might have lead Transport Canada to strongly question the validity of the claim. They also do not appear to have gotten a dump of the flight data recorder information to verify the extent of the flight deviation required. This is an unacceptable failure of the investigative branch of the Department.

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Finally look at the possible ‘drones’ that could be at 10,000 feet and 200 knots. This was not a parent out with their child flying a consumer drone, the very type the Minister is attacking with these proposed rules. The possibilities are numerous, but let’s look at several.

First it could have been an authorized drone flight under an SFOC which the crew failed to make themselves aware of through, published NOTAMS. The proposed rules would not have applied to an operator following the terms of their SFOC.

Second, it could have been a research facility again following the terms of their SFOC . Has Transport Canada investigated which operator with specific or blanket SFOC could have been operating there?

Third it could have been the US military. Flying in that area it is unlikely but possible. I have first hand accounts of US military drones flying at low altitude over the Peggy’s Cove in Nova Scotia. They would normally have permission, but it is a reasonable possibility.

Fourth it could have been Canada’s military. Their UAV exploits in active theaters of war is not very stellar. They could have been testing or lost control of one of their UAVs.

Has Transport Canada questioned the US or Canadian Military in respect of this incident?

Finally the most likely explanation is that the incident report is FALSE.

Insufficient detail has been made available to conclude otherwise. No detailed calculation and modeling of the incident has been released. As an outside observer, and with knowledge of visibility and speeds of drones, I can only conclude that the incident was a fabrication.

Transport Canada rules must be changed to require more strict processes be followed to investigate such events. Pilots found to have fabricated or embellished accounts must be removed from the cockpit. The rules propose Administrative Monetary Penalties to be assessed to Model Aircraft fliers. Similar rules MUST apply to pilots and operating companies over false or misleading incident reports. If the rules are deemed fair to model flyers, which I strongly disagree with, then they are just as fair to full size operators.

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Appendix D

Transport Canada has fallen victim to calling Model Planes, “Drones”. It is long overdue for them to be more precise in their use of language.

The field of endeavor is called Model Aviation. There are as many types of Model Planes as there are full sized planes. With technology, Model Aviation is leading the way. Model Aviation is as much a disruptive technology as cell phones were. Transport Canada has failed to accept or keep up with the changes. It is embarrassing to have a Transport Minister whose career has been based on science, math, engineering, and whose major exploit was an activity which deeply depended upon rational analysis of risk, and who now proposes rules which have abandoned those principles.

The word Drones has become associated with rotary winged aircraft of a certain style and appearance. All “drones” are Model Planes. All Model Planes are not drones. Transport Canada has to abandon the use of the word drones as a generic term referring to all Model Planes. The must be more specific and explanatory in their publications and dealings with the media. As it is now, persons who fly fixed wing model planes could be correct for saying they do not fly drones. I could also say when flying my Phantom 3 that I am not flying a model plane.

Just as Transport Canada should be clearer in what they intend to say, they must also recognize that regulations should differentiate based on type of Model Aircraft being flown. The risks are not the same. The rules should not be the same. Lumping 1kg planes with 25kg rotary winged aircraft are two drastically different risk scenarios. Abandon those differences and you will likely create rather than reduce risk.

For now the proposed rules are not reasonable. They are not likely to be practical. Enforcement will be problematic. When rules are not reasonable, not practical, not easily enforced, they will be ignored or flaunted. I don’t know what except political pressure will make Transport Canada understand this. They have a bee in their bonnet and do not seem inclined to listen to rational ideas.

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