

18 November 2020

Mr Ong Ye Kung
Minister for Transport

Dear Minister (Transport),

Recommendations on Promoting a Safe and Responsible Culture for the Use of Unmanned Aircraft

1. In my last letter dated August 2019, the Unmanned Aircraft Systems Advisory Panel had strongly recommended the implementation of mandatory unmanned aircraft (UA) registration to instil a sense of responsibility and accountability amongst UA operators. We are happy to note that our recommendations have been fully accepted, with mandatory UA registration implemented from 2 January 2020.

2. We also welcome additional steps taken by the Government in the past year to strengthen the UA regulatory framework. These include the introduction of a UA Basic Training and Pilot Licensing regime to ensure that operators of heavier UA are equipped with the knowledge and skills to operate UA safely and enhanced penalties for UA offences to send a deterrent signal to errant operators. The Civil Aviation Authority of Singapore (CAAS) has also made efforts to publicise safety guidelines and enable operators to find out where UA operations are permitted (e.g. through OneMap). We are confident that these measures will convince all UA operators that it is in their best interest to adhere to UA regulations.

3. Besides regulations, it is essential that a culture of safety be built among UA operators. Organisations (see [Annex A](#)) play an important role in building community norms, setting the tone for recreational UA operations in Singapore. We commend organisations which promote a safe and responsible culture, making UA operations safe and enjoyable for all. We urge the Government to lend support to such ground-up efforts and partner organisations with shared interests to promote safe and responsible UA operations. The support will greatly benefit these organisations, increasing their stature and attractiveness as responsible UA organisations.

UA Flying Areas

4. To help inculcate an interest in UA, provide common spaces for recreational UA operators to gather, and foster a culture of safety among the community, we recommend that the Government consider the development of UA flying areas. These flying areas will also provide new or beginner recreational operators with the assurance that UA operations are fully sanctioned at these sites.

5. To be optimally effective, UA flying areas need to ensure safety and balance the needs of the public and UA operators. We propose that UA flying areas be developed along the following principles:

- (i) **Safeguard aviation safety and security.** UA flying at UA flying areas should not compromise the safety of other airspace users such as military and commercial operations, and should not jeopardise national security. If needed, additional infrastructure and mitigation measures should be introduced to ensure aviation safety and security.

- (ii) **Uphold public safety.** UA operations should take place in a safe and responsible manner at these areas to ensure the safety of UA operators, other users, and the public. Measures, such as safety guidelines, should be put in place to facilitate this. UA operations should adhere to existing regulations.
- (iii) **Sensitive to the needs and concerns of the public.** UA operations should take place in a manner that demonstrates sensitivity to the needs of other users, and the public. For example, UA operations can be limited to certain time periods, like other similar recreational activities. It is important that recreational UA operators, other users, and the public work well together to ensure a positive environment for all.
- (iv) **Support the needs of UA operators.** UA flying areas should be sufficiently large for multiple UA operators to fly their UA concurrently and in a safe manner. Light amenities and safety features can be provided to support the needs of UA operators, such as charging points and work benches.
- (v) **Affordable.** To ensure UA operations are within reach of recreational operators, including new entrants, entry to UA flying areas should be kept affordable.
- (vi) **Financially sustainable.** UA flying areas must have a financially sound operating model to ensure support and growth of a community of UA operators in the long-term. The funding model should take into consideration future demand for UA flying areas.

6. We propose that UA flying areas be developed and implemented in a manner that is suited to Singapore's context. Based on a scan of UA flying areas across the world (see [Annex B](#)), we note that UA flying areas could range from sites that are for co-use to sites that are exclusive-use; sites which are rented for a few hours to sites that are set aside for UA operations on a longer-term basis. Some are community-initiated while others are Government-led. These operating models are tweaked and adapted to the contexts of the countries we examined. The operating models can be summarised in the following ways:

- (i) Site Exclusivity
 - a. Co-use. These are areas which are not exclusive to UA operations; other users might also use these sites. UA operators typically do not need to pay to access these areas.
 - b. Exclusive use. These are areas exclusively used for UA operations and actively run by and managed by an entity (e.g. commercial company, drone association). UA operators typically have to pre-book and pay for access to the sites. These sites tend to have more infrastructure.
- (ii) Duration
 - a. Rental. These are areas rented for UA operations and are used for a short period of time, such as for events.
 - b. Interim use. These are areas which are slated for development but can be leased in the interim for UA operations.
 - c. Established use. These are areas set aside for UA operations on a longer-term basis.

7. We are convinced that the development of established UA flying areas is the most effective way to grow a community of UA operators and build a culture of safety and responsibility on a sustained basis. Taking into consideration the COVID-19 situation, we propose that the Government consider implementing the concept of established UA flying areas when feasible. In addition, we encourage the Government to determine how best to support ground-up efforts that seek to develop such UA flying areas.

8. We are privileged to have been entrusted with providing views on the UA regulatory framework and helping to promote a safe and responsible culture for the use of UA. With the submission of this second and final set of recommendations, we have accomplished what we had set out to do. We are happy to continue to provide our expertise and experience on UA matters in support of the Government's continued efforts to facilitate beneficial uses of UA while safeguarding aviation safety and security.

9. We look forward to the Government's consideration of the recommendations.

Yours sincerely,



Mr Timothy de Souza

Chairman, Unmanned Aircraft Systems Advisory Panel

Enclosures

Annex A – Landscape of Organisations with UA Activities in Singapore

Annex B – Overseas Case Studies of Recreational UA Flying Areas

Landscape of Organisations with UA Activities in Singapore

1. There are 3 types of organisations that help to set the tone for recreational UA operations in Singapore:

a. Community organisations

Community organisations are entities comprising of hobbyists who come together over their shared interest in UA flying. These organisations implement safety guidelines and develop norms to creating a safe flying culture within their communities. Some of these organisations have developed their own UA flying area for use by their members while others have enhanced the vibrancy of UA activities through workshops and events, and increased interest in UA. Examples include the Multi-Rotor Association of Singapore and Radio Modellers Singapore.

b. Educational institutions

Educational institutions have begun to incorporate UA into their programmes and curriculum, to further interest in Science, Technology, Engineering, and Mathematics (STEM). These courses typically have practicum components which allow students to participate in hands-on activities involving UA. UA interest groups have also been set up in schools. UA operations for such groups take place in controlled settings with supervision. Examples of educational institutions which incorporate UA into their programmes include Temasek Polytechnic, Singapore University of Technology and Design, ITE College Central, and Republic Polytechnic.

c. UA education and training providers

UA education and training providers provide guidance to beginner operators via introductory workshops, programmes, and courses, helping them to understand basic flying concepts and safety principles while growing the community of UA operators. Several of these providers also provide advanced courses catering to UA operators with high proficiencies. Examples include Avetics, Garuda Robotics, MIRS Innovate, and JustFlyIt.

Overseas Case Studies of Recreational UA Flying Areas

1. We have identified several models of UA flying areas across a few countries, including the United States of America, Japan, and South Korea.

United States Federal Aviation Administration's Fixed Sites

2. Since 2018, the United States Federal Aviation Administration (FAA) has granted temporary airspace authorisations, allowing recreational operators to fly at certain “fixed sites” within controlled airspace¹ across the country. These sites are established via an agreement between a sponsor, typically an aeromodelling organisation, and the FAA.

3. The fixed sites are listed online on FAA's website and routinely updated. When operating at these sites, UA operators are required to abide by existing regulations (e.g. height restrictions, keeping UA within visual line of sight, not flying above people and moving vehicles) as well as additional site-specific guidelines.

Exclusive UA flying area (Enclosed): DJI Arena in Tokyo, Japan

4. The DJI Arena is a 535 square metres indoor arena located in Tokyo city. Outdoor UA flying is not allowed in most of Tokyo without approval from the authorities.

5. The Arena is managed and operated by Japan Circuit in partnership with DJI Japan. The arena is netted and the circuit is adjustable. UA operators can rent the arena on an hourly or daily basis. The arena offers pilot training programmes, hosts workshops, and organises events for schools, corporates and individuals.

Exclusive UA flying area (Outdoor): Hangang Drone Park in Seoul, South Korea

6. The Hangang Drone Park is a 27,000 square metres flying field that is designated for UA flying within Gwangnaru Hangang Park. The park is located east of Seoul along the Han river. UA flying is not allowed in central Seoul.

7. The drone park supports recreational UA operations for UA under 12kg. To fly at the park, UA operators must book a timeslot ahead of time, which is allocated on a first come first served basis. To ensure safety, the park limits the number of UA at any one time. UA flying can only be conducted within the park operating hours (from 8am to 4pm) and night flying is not allowed. UA operators are required to abide by existing regulations (e.g. height restriction of 150 metres, keeping UA within visual line of sight, not flying above people). The Korea Aeromodellers Association organises classes at Hangang Drone Park on a regular basis.

¹ Controlled airspace, as defined in the United States, is airspace located two or more miles (3.2km or more) around airports.