



### Issue 80

## DRONES IN WORKPLACE SAFETY AND HEALTH

Drones, also known as unmanned aerial vehicles (UAVs), have seen many technological advancements since their origins in the military. They provide a lower cost alternative to manned aircraft and can reduce risks to human life. Drones that are equipped with artificial intelligence (AI) and machine learning (ML) technology enhance safety and productivity at workplaces too. Data collected by drones can be analyzed by AI and ML, enabling humans to make quicker and better decisions without being subjected to risks.

The Civil Aviation Authority of Singapore (CAAS) regulates the use of unmanned aircraft in Singapore and the regulations governing the use of unmanned aircraft are outlined in the Air Navigation Act and its subsidiary legislation, Air Navigation (101-Unmanned Aircraft Operation) Regulations 2019.<sup>1</sup>

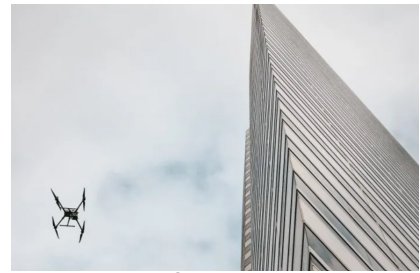
Various agencies in Singapore have incorporated the use of drones in their operations to make tasks easier, safer, and more efficient. For example, National Environmental Agency (NEA) has been using drones to check for mosquito breeding at dengue hotspots. These include areas that are risky for workers to carry out anti-dengue operations such as roof gutters in private estates.<sup>2,3,4</sup>



Source: GovTech<sup>2</sup>

The Building Construction Authority (BCA), together with the Standards Development Organisation, public agencies, AI experts and professional bodies have been encouraging the use of advanced technologies to increase productivity and efficiency in the Built Environment sector. Building inspections to identify defects and potential maintenance issues can be dangerous and time-consuming. Workers are subjected to the risks of working at height and a lot of equipment and manpower is needed to ensure work is carried out properly and safely. Drones is an enabling automation tool that Competent Person (CP) can use to meet the requirements of the Periodic Façade Inspection (PFI)<sup>5</sup> regime.

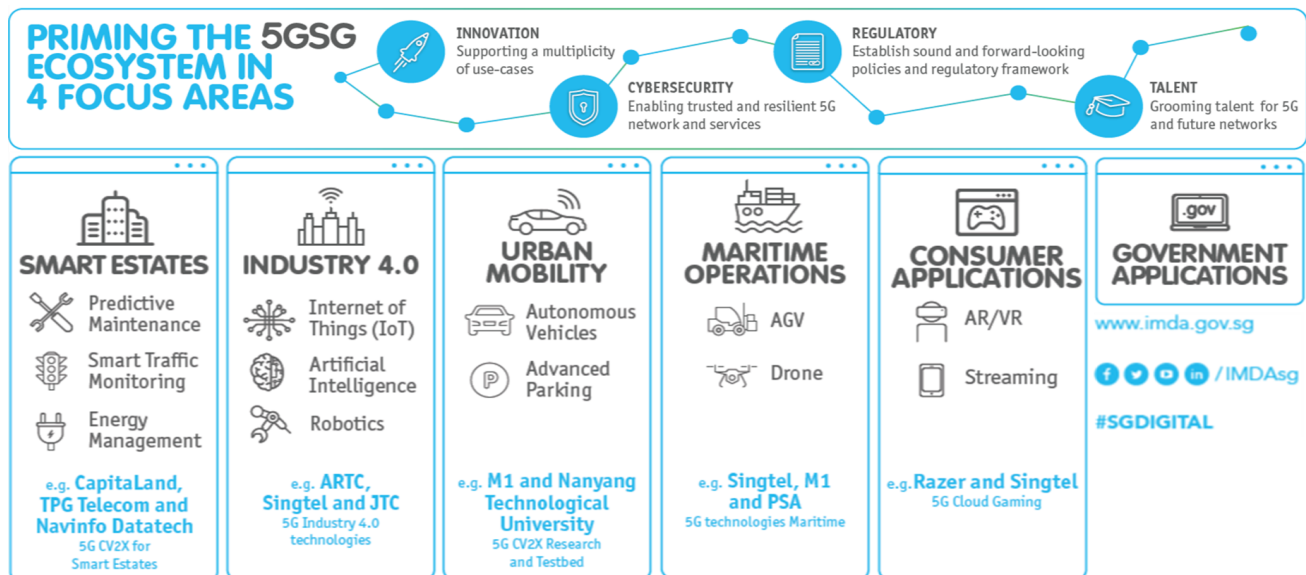
When conducting façade inspections, drones can be used in visual inspections, making façade inspections safer, more efficient, and less labour-intensive.<sup>6</sup> Together with industry stakeholders, BCA developed the world’s first Technical Reference (TR 78: Part 1 & 2) on use of drones to conduct building façade inspections under the Singapore Standards Programme administered by Enterprise Singapore.<sup>5</sup> Besides being safer, AI-enabled drone-based inspection with machine learning capabilities can also help to alleviate manpower constraint as such systems become more reliable and accurate over time to identify defects quickly.



Source: CNA<sup>6</sup>

The future of drones is promising, especially with the introduction of 5G technology. Currently there is a physical limitation as drones can only fly within line of sight of its drone pilot. With 5G there is an opportunity to overcome this limitation, for users to remotely control drones over the network. In future, drones could be operated beyond visual line of sights with Centralised Flight Management System (CFMS)<sup>7</sup> to accomplish their tasks, while being monitored remotely by personnel at their drone operation centres.<sup>3</sup>

To help companies develop, adopt, and commercialise 5G solutions locally, Infocomm Media Development Authority (IMDA) launched a 5G grant in 2021 and partnered Maritime and Port Authority of Singapore (MPA) and CapitaLand Investment (CLI) to allocate 4 testbed sites at Maritime Drone Estate (MDE), Singapore Science Park, PIXEL and Sentosa for 5G trials.<sup>9</sup>



Source: IMDA<sup>8</sup>

Drones is one of the solutions of interest and companies such as Airobotics, Garuda Robotics, ST Aerospace and Singtel, with the support of IMDA, are conducting 5G network and technology trials to enable safe and robust maritime drone operations. Nova Systems Asia has also tested the use of an unmanned aircraft traffic management system to enable large-scale drone operations.<sup>10</sup> The 5G grant and ecosystem goes beyond infrastructure and includes industry partnerships to develop 5G talent, as well as solutions and services to drive 5G adoption. Companies who wish to develop 5G drone solutions are encouraged to come on board to seize the opportunities offered.<sup>11</sup>



Source: MPA<sup>10</sup>

The list of successful drone use cases across industries continue to grow every day. Drones as a service will become a force-multiplier to support sustainable and economical solution for many dull, dire and dangerous applications. With the ability to operate in austere conditions, drones can help to lower workplace injuries and fatalities by eliminating the need to place workers in hazardous and dangerous environments.<sup>12</sup>

## References

### [1] CAAS Air Navigation Act

<https://www.caas.gov.sg/legislation-regulations/legislation/air-navigation-act>

### [2] Drones that keep Singapore going

<https://www.tech.gov.sg/media/technews/drones-that-keep-singapore-going>

### [3] How Red Dot Drone is realising Singapore's dream to become a smart nation

<https://e27.co/a-drone-eye-view-how-red-dot-drone-is-realising-singapores-dream-to-become-a-smart-nation-20210413/>

### [4] Singapore Smart Nation initiatives and possible opportunities

<https://www.scs.org.sg/articles/smart-nation-singapore>

### [5] Periodic Facade Inspection (PFI) Media Release

<https://www1.bca.gov.sg/about-us/news-and-publications/media-releases/2021/10/21/new-regulations-for-periodic-inspection-of-building-façades-to-start-from-1-january-2022>

## References

[6] 'Safer, more efficient and less labour intensive': Drones to be used to conduct building facade inspection

<https://www.channelnewsasia.com/singapore/drones-inspect-building-facade-safer-new-regulations-bca-2257857>

[7] Advisory Circular—Centralised Flight Management System

<https://www.caas.gov.sg/docs/default-source/docs---srg/ac-anr101-2a-1-centralised-flight-management-system--20220404.pdf>

[8] IMDA 5G Innovation

<https://www.imda.gov.sg/programme-listing/5G-Innovation>

[9] IMDA to open up 4 5G testbeds to all businesses

<https://www.businesstimes.com.sg/government-economy/imda-to-open-up-4-5g-testbeds-to-all-businesses>

[10] Launch of Singapore's Maritime Drone Estate as Test Bed for Drone Technologies

<https://www.mpa.gov.sg/web/portal/home/media-centre/news-releases/detail/fcb27660-2879-47dc-aad1-fa4af9d59ea9>

[11] IMDA announces new funding to boost 5G adoption and commercialization

<https://www.itnews.asia/news/imda-announces-new-funding-to-boost-5g-adoption-and-commercialisation-560614>

[12] Here's How Drones Improve Workplace Safety

<https://consortiq.com/uas-resources/heres-how-drones-improve-workplace-safety>

*OWLlinks is brought to you by Workplace Safety and Health Institute, Singapore.*

For enquiries, feedback or to unsubscribe, please email us at [contact@wshi.gov.sg](mailto:contact@wshi.gov.sg)

The information provided here is based on information available at the time when this issue of OWLlinks was compiled. The information provided here is not to be construed as implying any liability to any party nor should it be taken to encapsulate all the responsibilities and obligations of the reader of OWLlinks under the law. Please note that Workplace Safety and Health Institute will be unable to provide full-text of articles listed in this OWLlinks if it contravenes the copyright regulation.