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#### **Our Mission**

To grow a safe, vibrant air hub and civil aviation system, making a key contribution to Singapore's success.

#### **Our Vision**

A leader in civil aviation; a city connecting the world.

The Civil Aviation Authority of Singapore (CAAS) is a statutory board under the Ministry of Transport, entrusted with the mission to "Grow a safe, vibrant air hub and civil aviation system, making a key contribution to Singapore's success". As the national civil aviation authority of Singapore, CAAS' roles are to oversee and promote safety in the aviation industry, develop the Singapore air hub and aviation industry, provide air navigation services and contribute to the development of international civil aviation.



oto credit: Liew Tong Leng



#### **Scope and Boundary**

This sustainability report covers our sustainability approach, performance, initiatives, and practices for identified Economic, Environment, Social and Governance (EESG) material topics between the period of 1 April 2024 and 31 March 2025 (FY24/25), unless otherwise stated.

The report reflects sustainability performance and practices across CAAS and the broader aviation sector. For a comprehensive picture of our performance, the Sustainability Report should be read together with the financial information detailed in CAAS <u>Annual Report 2024/25</u>.

#### **Reporting Framework**

This report is guided by the GreenGov.SG requirements and has been prepared with reference to the Global Reporting Initiative (GRI) standards 2021. The GRI standards are selected as they are the most widely adopted standards for reporting on EESG material matters. This report is aligned with the United Nations Sustainable Development Goals (UN SDGs) as applicable.

External assurance has not been sought for CAAS' FY24/25 sustainability report. However, CAAS has conducted an internal review focused on relevance and reliability of information. CAAS welcomes any questions and feedback from all our stakeholders, as they are integral to CAAS' sustainability journey. Please send your questions or feedback on the report via the contact form <a href="here">here</a>.







Global air travel demand is expected to rise strongly in the coming years, connecting the world, creating growth and jobs. We are proud to present CAAS' inaugural Sustainability Report, which lays out CAAS' commitment to sustainable growth, along three key thrusts: a) Decarbonising the Aviation Sector; b) Managing Aviation Operations Sustainably; and c) Building a Resilient and Sustainable Workforce.

#### **Decarbonising the Aviation Sector**

As aviation grows, it needs to be more sustainable. The International Civil Aviation Organization (ICAO) has set a Long-Term Aspirational Goal of achieving net zero carbon emissions for international aviation by 2050. As a global air hub and Council Member of the ICAO, Singapore is committed to doing our part, in a balanced and pragmatic way that maintains competitiveness. The Singapore Sustainable Air Hub Blueprint sets out our targets for decarbonising the Singapore aviation sector for 2030 and 2050 and 12 initiatives we will implement across the airport, airline and air traffic management domains. They include the electrification of Changi Airport's airside vehicle fleet, introduction of a Sustainable Aviation Fuel (SAF) Levy from 2026 and more direct flight routes.

#### **Managing Aviation Operations Sustainably**

As global demand grows, aviation needs to ensure that day-to-day operations remain safe, efficient, and reliable. As the regulator and developer of the Singapore air hub, CAAS will look ahead to anticipate the future, build capacity and capabilities, and work with aviation companies and workers to future-proof our aviation ecosystem. CAAS has set aside S\$1 billion to support sector development over the next five years, in the areas of connectivity, infrastructure, technology and innovation, and manpower. CAAS has also launched the National Aviation Safety Plan 2025-2027 which identifies safety challenges and sets out an action plan of 45 initiatives which the Singapore aviation sector will take together.



## CHAIRMAN AND DIRECTOR-GENERAL MESSAGE (CONT.)

#### **Building a Resilient and Sustainable Workforce**

At CAAS and for the Singapore aviation sector, people are the reason for our continued success and lie at the heart of everything we do. The Singapore aviation workforce is today over 60,000 strong. As aviation grows, we will continue to create good and quality jobs for Singaporeans. We will also leverage technology, including artificial intelligence, to augment our workforce and help them do their jobs better. The Aviation Jobs Transformation Report outlines our strategy to build a resilient and sustainable aviation workforce, driving growth and transformation.

CAAS will continue to lead with ambition, ensuring aviation remains a key driver of Singapore's economic growth and we continue to connect the world and bring people closer together.

#### **Looking Ahead**

Post-COVID, the future of aviation is bright. Singapore is well placed to ride the winds of growth. CAAS will continue to lead with ambition, ensuring aviation remains a key driver of Singapore's economic growth and we continue to connect the world and bring people closer together. We thank our staff and our local and international partners for their support. Our ability to work together and shared commitment to serve with trust and honour will help us navigate a more turbulent world.



Chairman

eng



**Mr Han Kok Juan** Director-General

## FY24/25 REPORT HIGHLIGHTS

Decarbonising the Aviation Sector

Managing Aviation
Operations Sustainably

Building a Resilient and Sustainable Workforce



**30%** of over 2,500 airside vehicles are electric as of July 2025



Signed a new

#### Air Services Agreement (ASA)

with Cuba, and upgraded its agreements with six other countries



Established the

#### \$200 million

OneAviation Manpower Programme



**300+** Electric Vehicles (EV) charging points to be deployed over the next few years



Established the

## International Avionics Lab in

Singapore to explore, initiate and undertake avionics innovation projects



Published the Singapore

#### **Aviation Jobs Transformation Report**

to prepare and equip our aviation workforce with essential skills for future roles



Published a Handbook on

## Aviation Safety Culture

which features practical do's and don'ts, real-world case studies, and industry apendotes



Completed a CAAS Workplace
Transformation project to accommodate
a growing workforce and prioritise

employee well-being



#### SUSTAINABILITY APPROACH

#### **CAAS' Sustainability Governance**

CAAS' governance structure supports the organisation's strategic direction and sustainability efforts through clearly defined roles and responsibilities. Together, these governance bodies ensure that sustainability is integrated into CAAS' organisational and sector-wide initiatives.

- The CAAS Authority is appointed by the Minister for Transport. Led by Chairman Mr. Edmund Cheng, the Authority plays a crucial role in overseeing and shaping the organisation's sustainability efforts. It ensures that sustainability is integrated into CAAS' strategic vision and operations, and guides governance policies that promote environmental responsibility, social equity and economic viability. The Authority meets regularly to deliberate on key issues including relevant policies affecting sustainability and selection of material topics for CAAS sustainability reporting. By actively engaging with external and internal stakeholders and fostering a culture of accountability, the Authority helps the organisation meet regulatory requirements and build long-term value and trust.
- The CAAS Management Committee, led by the Director-General, translates the Authority's strategic directions and goals into action plans. The Management Committee is responsible for setting the environmental targets aligned to GreenGov.SG. It drives the digitalisation, decarbonisation and manpower development efforts of Singapore's aviation industry, and leads efforts to foster consensus, collaboration and partnerships at the international level. Its oversight spans two key areas: sector-wide environmental sustainability, managed by the Sustainability Office under the Chief Sustainability Officer, and organisation-specific efforts, led by the CAAS Corporate Social Responsibility (CSR) Committee.
- The CAAS CSR Committee was established in 2015 and is chaired by the Director (Corporate Development). The committee comprises representatives from relevant divisions and is responsible for driving and managing CSR activities across the organisation. Its focus spans four key areas including environment, community, governance, and the workforce, with particular emphasis on environmental initiatives and community outreach.
- The CAAS Sustainability Office leads aviation-focused sustainability efforts and is headed by the Chief Sustainability Officer. The Sustainability Office is responsible for advancing sustainability goals for Singapore's aviation sector.







#### Sustainability Materiality Assessment

In FY24/25, CAAS conducted a materiality assessment to identify the sustainability issues most relevant to its stakeholders and operations. The final list of CAAS' Sustainability Material Topics covering Economic, Environment, Social, Governance is presented below.

Material Topic	Why topic is material to CAAS	UN SDGs
Air Connectivity and Air Traffic	Air Connectivity is central to Singapore's role as a global aviation hub. Efficient air traffic management supports economic growth, trade, and tourism, while ensuring resilience and competitiveness. As demand grows, the sustainable management of connectivity and traffic is key to minimising environmental impact and supporting long-term development.	17 PARTHEROUS FOR THE COOKS
Technology and Innovation	Technology and Innovation drive safer, smarter, and more sustainable aviation. By adopting advanced solutions—including Unmanned Aircraft Systems—CAAS enhances operations, improves passenger experience, and strengthens resilience. Staying ahead of emerging challenges ensures Singapore's aviation sector remains agile and globally competitive.	9 MADESTEE SOURCE
Climate Resilience and Energy Management	The aviation sector is vulnerable to climate risks such as extreme weather and rising temperatures. By addressing climate impacts and reducing emissions and energy use, CAAS supports global and national decarbonisation efforts, mitigates operational risks, and enhances long-term efficiency.	7 GEAS GENERAL AND ACTION ACTION ACTION
Employee Well-being and Development	A skilled, motivated workforce is vital to aviation safety, service excellence, and innovation. By investing in training, development, workplace transformation and staff well-being, CAAS attracts and retains talent, enhances productivity, and builds organisational resilience—ensuring a safe, engaged, and future-ready team.	3 GOOD HEALTH 4 COLLITY BUILDING STORTH WORK AND ECONOMIC GROWTH STORTH
Aviation Safety	Safety is foundational to public trust and Singapore's reputation as a leading air hub. Through strong oversight and adherence to global standards, CAAS safeguards lives, ensures service quality and secures the long-term resilience of the aviation sector.	3 GOOD MAITH AND WELL-BEING  8 MICHAEL MAINS CONTINUES AND 17 PARTIMENSAND'S PORTHE COMM.  17 PARTIMENSAND'S PORTHE COMM.  18 MICHAEL MAINS PORTHE COMM.  19 PARTIMENSAND'S PORTHE COMM.  19 PARTIMENSAND'S PORTHE COMM.  10 PARTIMENSAND'S PORTHE COMM.  11 PARTIMENSAND'S PORTHE COMM.  12 PARTIMENSAND'S PORTHE COMM.  13 PARTIMENSAND'S PORTHE COMM.  14 PARTIMENSAND'S PORTHE COMM.  15 PARTIMENSAND'S PORTHE COMM.  16 PARTIMENSAND'S PORTHE COMM.  17 PARTIMENSAND'S PORTHE COMM.  17 PARTIMENSAND'S PORTHE COMM.  18 P
Ethical And Fair Business Practices	Integrity, transparency, and fairness are essential to CAAS' role as a regulator and service provider. Upholding these principles fosters trust, ensures legal compliance, and strengthens responsible governance across the aviation ecosystem.	16 PENEL METER AND STRONG RECTIFICIONS
Critical Incident Risk Management	CAAS Enterprise Risk Management is essential to safeguarding lives and ensuring operational continuity during emergencies—from security threats to public health crises. By identifying and mitigating critical risks, CAAS strengthens resilience and reinforces Singapore's reputation as a safe and reliable air hub.	3 GOOD HEALTH  8 SCENT WORK AND LECKNOOL COOPER  16 PLACE, NUTTINE RECTUREDAY





## Decarbonising the Aviation Sector

As the key sector agency for Singapore's aviation sector, CAAS is strategically positioned to drive sector-wide sustainability efforts through collaboration with industry partners and the international community. It plays a pivotal role in steering the aviation sector towards decarbonisation, while ensuring the long-term competitiveness and sustainable growth of Singapore's air hub. Within the organisation, CAAS consistently monitors and improves its internal environmental performance complementing broader sectoral initiatives.





# Leading the Flight to a More Sustainable Future: Advancing Environmental Sustainability in Aviation



At CAAS, we recognise that sustainability is not just an organisational priority, but a shared goal across the entire aviation ecosystem. Our mission is to lead Singapore's aviation sector towards a more sustainable future by championing innovation, forging strong partnerships, and setting pragmatic targets.

Through collaboration and a whole-of-ecosystem approach, we are committed to reducing our environmental impact while ensuring the long-term competitiveness and resilience of Singapore's air hub.

Daniel Ng

CAAS Chief Sustainability Officer



Mr. Daniel Ng serves as the Chief Sustainability Officer since 2022. In this capacity, he leads the development, implementation and review of domestic and international climate change targets, policies and strategies across CAAS and the Singapore aviation sector.

Photo credit: Changi Airport Group



#### CAAS' DECARBONISATION STRATEGY

CAAS is committed to supporting the long-term, sustainable growth of Singapore's aviation sector. At the heart of this commitment is our goal to achieve net zero domestic and international aviation emissions by 2050. This ambition is guided by the <u>Singapore Sustainable Air Hub Blueprint</u>, launched in February 2024 and submitted to the International Civil Aviation Organization (ICAO) as Singapore's State Action Plan. The Blueprint reflects a balanced approach, one that recognises the importance of environmental sustainability while ensuring that the Singapore air hub remains competitive and resilient in the decades ahead.

CAAS' decarbonisation strategy is built on a structured framework that spans three key operational domains: Airport, Airline, and Air Traffic Management (ATM). These are supported by five enablers: policy and regulation, industry development, infrastructure planning, workforce transformation, and international partnerships. This whole-of-ecosystem approach ensures that our efforts are well-integrated across the aviation value chain, from ground operations and fuel supply to aircraft performance and airspace efficiency.





### AIRPORT DOMAIN

Maximal efforts to reduce energy use and deploy renewables

- Solar power deployment
- Clean energy airside vehicles
- Building energy efficiency
- Low-carbon electricity imports
- Resource circularity through waste-to-energy



Build ecosystem to support the use of Sustainable Aviation Fuel (SAF) in Singapore

- National SAF target and SAF levy
- Central SAF procurement
- SAF production in Singapore and the region
- Airline fleet renewal and operational improvements



Operational improvements to increase efficiency and reduce fuel burn

- Advanced demandcapacity balancing implementation
- Performance-based navigation enhancement
- Gate-to-gate trajectory optimisation

#### **CRITICAL ENABLERS**

**Build coalitions for action** 

- Policy and regulation
- Industry development
- Infrastructure planning and provision
- Workforce transformation
- International partnerships and collaborations

Under the Blueprint, CAAS will work with aviation stakeholders to reduce domestic aviation emissions from airport operations by

20%

from 2019 levels in 2030 and achieve net zero domestic and international aviation emissions by 2050.



#### 13

## Airport Domain: Electrification of Changi Airport's Airside Fleet

- 30% of Changi Airport's over 2,500 airside vehicles are electric as of July 2025
- 300+ Electric Vehicles (EV) charging points will be deployed over the next few years

Changi Airport is making strong progress toward its goal for all airside vehicles to operate on cleaner energy by 2040. To drive this shift, CAAS and CAG have partnered with ground handling companies to coordinate efforts and track progress. A major milestone took effect on 12 March 2025, when all new Class 3 vehicles registered for airside operations, such as cars, vans, forklifts, and tractors, were required to be electric. As of July 2025, 30% of the over 2,500 airside vehicles at Changi Airport are already electric, up from 20% in March 2023. To support this transition, more than 300 EV charging points will be installed across the airside over the next few years. For heavier and specialised vehicles where electric options are limited, renewable diesel (RD) trials began in 2024, involving key partners like the Changi Airport Group, dnata, SATS, and SIA Engineering Company (SIAEC).



An electric airside vehicle connected to its charging station

## Airline Domain: Scaling Sustainable Aviation Fuel (SAF)

 1% SAF uplift target in 2026, rising to 3-5% by 2030 subject to global development and wider availability and adoption of SAF

Singapore is taking bold steps to decarbonise aviation fuel use, with CAAS leading efforts on both the demand and supply fronts. This includes setting a national SAF target and introducing a levy to drive adoption, centralising procurement to manage costs and ensure supply, and scaling up production capabilities both locally and regionally. These coordinated initiatives aim to build a robust and sustainable SAF ecosystem that supports long-term emissions reduction in aviation. From 2026, flights departing Singapore will be required to use SAF, starting with a 1% target and scaling up to 3-5% by 2030 subject to global developments and wider availability and adoption of SAF.



The refuelling of an aircraft with SAF

## ATM Domain: Smarter Flight Paths with Direct Routing

- Approximately 51,000 flights used Direct Routing Operations (DRO) in FY24/25
- Approximately 176,000 nautical miles saved, about 5.96ktCO₂ (1.88kt of fuel savings)

To reduce fuel consumption and emissions from flights, CAAS has implemented Direct Routing Operations (DRO), a key initiative under the Sustainable Air Hub Blueprint. DRO allows airlines to plan more direct and efficient flight paths, reducing unnecessary detours and fuel burn. In FY24/25, approximately 51,000 of the flights filed for direct routings. This resulted in a total of approximately 176,000 nautical miles saved, equivalent to about 5.96ktCO<sub>2</sub> (1.88kt of fuel savings). DRO is a clear example of how smarter air traffic management can deliver real environmental benefits while maintaining operational efficiency.



Direct Routing Operations can reduce the unnecessary combustion of aviation fuel, hence reducing emissions





#### Collaboration in Sustainable Aviation

CAAS believes that strong partnerships are key to achieving its sustainability goals. Over the years, it has found that close industry engagement, clear regulatory guidance, and balanced implementation timelines are essential for success. Hence, CAAS works closely with stakeholders, including airlines, fuel suppliers, International Air Transport Association (IATA), and other government agencies, through regular engagement sessions and consultations. Feedback from these stakeholders helps refine strategies and ensure that initiatives are both practical and effective. Many of the initiatives in the Singapore Sustainable Air Hub Blueprint are still in their early stages and CAAS will continue to gather input and assess their effectiveness as they mature.

As part of its commitment to international collaboration and leadership in sustainable aviation, CAAS actively engages with the International Civil Aviation Organization (ICAO) to shape global sustainability policies and share best practices. This includes active participation throughout the 13th cycle of the ICAO Committee on Aviation Environmental Protection (CAEP), which spans a three-year period (2022-2025). The cycle culminated in a main meeting held in February 2025, where global experts convened to consolidate discussions and advance ICAO's environmental standards, including those related to aircraft noise, emissions, and operational measures. CAAS contributed to key discussions on long-term climate goals and the implementation of sustainable aviation practices and continues to participate in CAEP's working groups to support the development of science-based environmental policies. Through these engagements, CAAS continues to contribute to shaping global aviation sustainability policies, while aligning Singapore's efforts with international best practices and scientific advancements.

#### **Aviation Emissions Profile**

Singapore's Aviation Sector plays a vital role in global connectivity, with significant operational scale. As air traffic continues to grow, understanding the emission profile is essential for identifying high-impact areas for decarbonisation. To address aviation emissions, CAAS tracks the annual emissions and sustainability initiatives of aviation ecosystem stakeholders and continues to implement the Singapore Sustainable Air Hub Blueprint, which covers the Airport, Airline, and ATM domains, including Changi East developments, where T5 will be a Green Mark Platinum Super Low Energy building.

	2022	2023	2024
Domestic aviation emissions from Changi and Seletar Airports (ktCO2)	277.7	298.9	301.2
International aviation emissions from Singapore based operators (MtCO₂e)	11.9	14.7	16.8



#### CAAS' SUSTAINABILITY INITIATIVES AND ENVIRONMENTAL PROFILE

Climate change is an urgent global crisis. CAAS is firmly committed to securing a greener future for our people and for the organisation. As the national aviation authority, this commitment aligns with the broader national effort under the GreenGov.SG initiative, which drives the Public Sector to lead by example in environmental sustainability. Through GreenGov.SG, the Public Sector is working toward ambitious targets in energy efficiency, water conservation, waste reduction, and solar adoption. As part of this collective effort, CAAS is taking deliberate steps to reduce its carbon footprint, improve resource efficiency, and support Singapore's transition to a low-carbon future.

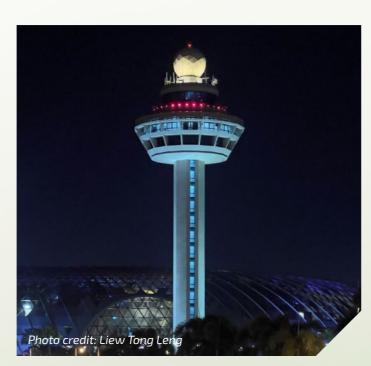
#### Smart Building Management for a Sustainable Workplace

To enhance environmental performance across its premises, CAAS has implemented Building Management Systems (BMS) that enables real-time monitoring of critical environmental data. This system empowers facility managers to respond swiftly to deviations from optimal conditions, ensuring a safe, comfortable, and resource-efficient workspace.

#### Fostering a Sustainable Workplace Culture at CAAS

At CAAS, sustainability is not just a strategic goal, it's a shared responsibility embraced by employees across the organisation. Through green office practices and meaningful partnerships, CAAS is cultivating a culture of environmental stewardship and community engagement.

Empowering Employees to Act - CAAS actively engages its workforce in sustainability efforts, helping staff understand the impact of their actions and encouraging them to contribute meaningfully. One key initiative is CAAS' annual participation in Earth Hour, where non-essential façade lighting at the Changi Control Tower and Singapore Aviation Academy is switched off for an hour. Staff are also encouraged to join the switch-off at home, reinforcing a collective commitment to climate action. Employees are actively encouraged to contribute innovative sustainability ideas through dedicated ideathon initiatives, fostering continuous improvement in environmental sustainability practices within the workplace.



Switching off non-essential façade lighting at the Changi Control Tower during Earth Hour

Community-Driven Recycling Initiatives - In 2024, CAAS, together with the aviation community participated in textile recycling drives, collecting used clothing and donating it to the Metta Welfare Association. The proceeds supported Arts@Metta, a social enterprise that empowers youth artists with special needs. This initiative not only diverted waste from landfills but also contributed to a meaningful social cause. CAAS also collects its e-waste, such as old electronic devices, for upcycling. These efforts reflect CAAS' holistic approach to sustainability, combining environmental responsibility with community support.

#### **Monitoring of Corporate Office Environment**

In 2024, CAAS took a further step by launching an environmental monitoring platform at its Corporate Office. This platform tracks a wide range of parameters essential for both health and sustainability, including indoor air quality indicators such as carbon dioxide  $(CO_2)$  concentrations. Annual air quality testing is conducted to ensure that indoor environments remain safe and healthy for all occupants. Beyond air quality, the system integrates temperature and humidity sensors, allowing for automatic adjustments that optimise comfort while minimising energy use. Utilities consumption is monitored at a zonal level, providing granular insights into electricity and water usage. This data supports targeted initiatives to reduce resource consumption and improve operational efficiency. Additional energy-saving features include:

- Dimmable lighting systems that respond to occupancy, as well as natural light
- Variable air conditioning supply based on room heat load

All collected data are synthesised into analytics dashboards and reports, enabling evidencebased decision-making and continuous improvement. These efforts not only support CAAS' environmental objectives but also demonstrate smart and responsible building management.





in Singapore. CAAS sets sustainability targets



All new buildings and existing buildings which undergo major retrofitting to equivalent, where feasible.



Improve the Energy Utilisation Index by 10% by 2030 from average of 2018-2020 levels



Improve the Water Efficiency Index by 10% by 2030 from the average of 2018-2020 levels



Improve CAAS Waste Disposal Index by 30% by 2030 from 2022 levels



100% of cars to run on cleaner energy by 2035



Reduce carbon emissions to support Whole-of-Government effort to peak carbon emissions

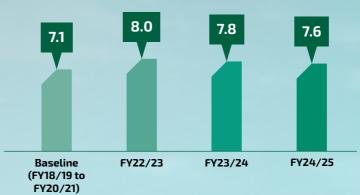




#### Reducing Greenhouse Gas Emissions

CAAS is committed to reducing its carbon footprint in alignment with the national GreenGov.SG framework. To track progress meaningfully, CAAS has taken the average of FY18/19 to FY20/21 in setting the baseline. This baseline was chosen to better reflect hybrid working arrangements post-pandemic. Following 2020, heightened activities at CAAS' operational premises were needed to support post-COVID air travel ramp-up. In FY24/25, CAAS recorded 7.6 kilotonnes of  $CO_2$  equivalent (kt $CO_2$ e) in total emissions. This figure includes both direct emissions from sources owned or controlled by CAAS and indirect emissions from purchased electricity. Compared to FY23/24, this represents a 2.8% decrease in total emissions.

#### TOTAL EMISSION (ktCO<sub>2</sub>e)







## Optimising Electricity Consumption and Greening the Vehicle Fleet

Electricity use remains the primary contributor to CAAS' emissions. CAAS has invested in infrastructure enhancement, including adopting the Guaranteed Energy Savings Performance contracting model for chilled water plant retrofits and adopting energy-efficient appliances and fittings in our premises. Over the years, our premises have achieved the following:

- Since 2018 Green Mark Platinum Certification for Singapore Aviation Academy and Seletar Passenger Terminal Building.
- Since 2022 Green Mark (Healthier Workplace) Goldplus for CAAS Corporate Office.
- December 2022 Building & Construction Authority Green Mark Platinum Award for the new development at the Singapore Air Traffic Control Centre (SATCC), which is still under construction.



CAAS has also installed solar panels at the Singapore Air Traffic Control Centre (SATCC) and plans to expand solar deployment to the Singapore Aviation Academy. CAAS will continue upgrading its infrastructure to boost energy efficiency, including a new, more efficient water-cooled chiller plant in SATCC. These enhancements will support CAAS' ongoing energy conservation efforts.

These initiatives contributed to a 3.3% decrease in electricity consumption in FY24/25 compared to FY23/24, with usage falling from 18.9 GWh to 18.3 GWh. This reduction was primarily driven by adoption of energy-efficient appliances that reduced overall load across facilities and enhanced real-time monitoring and control through smart building management systems, which enabled optimization of energy use and early detection of inefficiencies. Similarly, the Energy Ultilisation Index (EUI) improved by 3.3% year-on-year, reflecting better energy performance per unit area.

To mitigate scope 1 emissions, CAAS is committed to transitioning its fleet of 13 vehicles to cleaner energy sources by 2035, or upon the expiration of each vehicle's Certificate of Entitlement, whichever is earlier and contingent on the availability of suitable clean energy models.

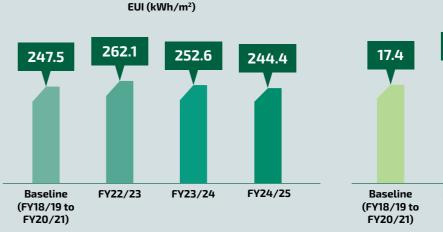
#### Advancing Sustainability Through Green Procurement at CAAS

CAAS has strengthened its green procurement practices to ensure that environmental considerations are embedded in purchasing decisions. These enhanced measures aim to reduce energy consumption, promote resource efficiency, and support Singapore's broader sustainability goals.

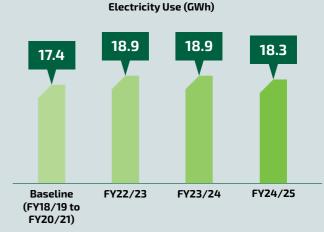
In procuring electrical appliances, CAAS now evaluates not only upfront costs but also energy efficiency and lifecycle costs to ensure long-term value and reduced environmental impact. For lighting, all lamps must meet a minimum 3-tick rating under the National Environment Agency's (NEA) Mandatory Energy Labelling Scheme (MELS), ensuring high energy performance. Similarly, air-conditioners must be rated at least 3-ticks, while refrigerators must meet a minimum 2-tick rating under MELS. For televisions, a higher standard is applied, requiring at least a 4-tick rating, except for 40 to 43-inch models, which must be rated at least 3-ticks.

Beyond electrical appliances, CAAS also ensures that white printing paper is certified with the Singapore Green Label by the Singapore Environment Council, supporting responsible sourcing and reduced environmental footprint.

#### ELECTRICITY CONSUMPTION FROM CAAS PREMISES



**EUI: 3.3%** improvement from FY23/24



**Electricity Use: 3.3%** decrease in FY24/25

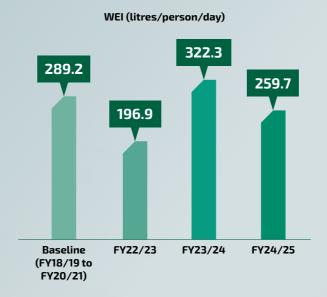


#### **Reducing Water Usage**

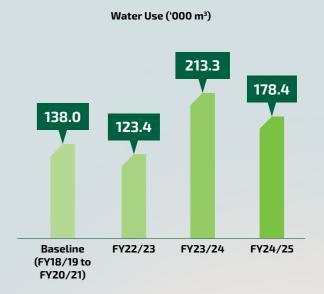
CAAS' Water Efficiency Index (WEI) improved by 19.4% compared to FY23/24. This was due to the bulk of operations being decanted during Singapore Aviation Academy's (SAA) construction works and the improvements observed at various CAAS premises. The new SAA buildings will be retrofitted with better water-efficient fittings.

CAAS remains committed to optimising water usage where measures implemented include a robust inspection and maintenance regime supported by a smart utility metering system, adoption of the 3-ticks rating under the Water Efficiency Labelling Scheme, and the removal of decorative water features to further reduce our overall water consumption.

#### **■ WATER CONSUMPTION WITHIN CAAS' PREMISES**



WEI: 19.4% improvement in FY24/25 from FY23/24



**Water Use: 16.3%** decrease in FY24/25 from FY23/24





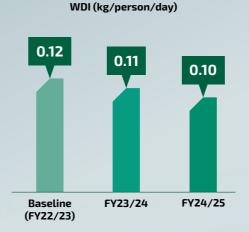
#### Managing Waste More Effectively

The Waste Disposal Index (WDI) for CAAS premises improved by 6.7% compared to FY23/24. This improvement was attributed to the bulk of operations being decanted during Singapore Aviation Academy's construction works and other CAAS buildings which have adopted more avenues for recycling and centralised waste bins. Increased work from home arrangement for CAAS officers during the renovation of the corporate office and digitisation of records also contributed to this improvement.

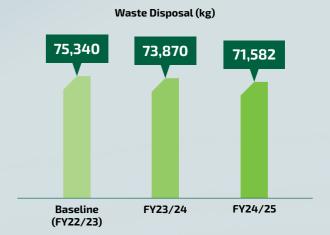
CAAS has undertaken progressive measures over the years to minimise waste generation and promoted resource efficiency across its operations. Within the corporate office, centralised waste bins have been introduced, with recycling bins strategically placed beside them to encourage proper waste segregation and recycling. These recycling bins have also been deployed across CAAS' facilities to support consistent recycling practices organisation-wide.

To reduce paper consumption, CAAS has digitised various paper-based processes and established centralised utility areas for shared printer access. This not only streamlines printing needs but also contributes to a significant reduction in paper usage. In addition, CAAS also actively manages horticultural waste by ensuring that it is collected and recycled appropriately.

#### ■ WASTE GENERATED WITHIN CAAS' PREMISES



WDI: 6.7% improvement in FY24/25 from FY23/24



**Waste Disposed: 3.1%** *decrease in* FY24/25 *from* FY23/24



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#### **TECHNOLOGY AND INNOVATION**

Technology and Innovation are central to CAAS' vision for a future-ready Aviation Sector. CAAS will launch a Technology and Infrastructure Roadmapping Exercise to map out new operational capabilities and their supporting technology and infrastructure in the first quarter of 2026. This roadmap will take an ecosystem view to systematically identify research priorities and investment areas, aligning external trends with practical applications that can be realised within five to ten years. The initiative aims to catalyse priority technology fields, ensuring resources are strategically deployed to address Singapore's vision of the future of aviation.

CAAS allocates resources to support these Technology and Innovation efforts, including funding for research and development, deployment, talent development, and infrastructure. Progress is monitored through performance indicators, with regular reviews to ensure continued relevance and effectiveness. Case studies featured throughout this report illustrate how technology and innovation are being applied in practice, from operational enhancements to workforce transformation, demonstrating CAAS' commitment to sustainable and resilient aviation.

#### International Centre for Aviation Innovation (ICAI)

To further support innovation, the development and adoption of transformative technologies in aviation, CAAS has established the International Centre for Aviation Innovation (ICAI). ICAI's roles are to accelerate research and development (R&D) and translate innovation into operational use across the aviation ecosystem. As an initial focus, ICAI will undertake R&D projects in:

- Next Generation Air Navigation Services: Optimising air traffic handling and enabling seamless navigation through regional experimentation platforms.
- Automated & Smart Airports: Driving digitalisation and automation of airport operations, including proof-of-concept trials in live environments.

Beyond these verticals, ICAI will focus on:

- Translating research into deployment using a systems lifecycle approach.
- Building capabilities through simulation, modelling, and validation in a dedicated Innovation Lab.

Located in Singapore, ICAI will focus on the Asia-Pacific region, where air travel demand is projected to grow significantly. It will adopt a vendor-agnostic, open architecture approach to ensure seamless operational interface and where necessary, integration and scalability of solutions. ICAI will partner with governments, industry, and research institutes globally to pool expertise and resources. ICAI also manages projects under CAAS' Aviation Transformation Programme (ATP) to drive R&D for next-

generation air navigation services and airport optimisation solutions. ICAI aims to address complex challenges such as capacity constraints and manpower shortages through coordinated innovation. By fostering cross-border and public-private collaboration, ICAI will help de-risk investments and empower transformative change in aviation.



International Aviation Lab (IAL) MOU signing ceremony in September 2024. IAL is a global initiative involving local and international partners to enhance airport operational capacity and efficiency through joint innovation



## Managing Aviation Operations Sustainably



CAAS plays a crucial role in building a future-ready and trusted aviation ecosystem. This is accomplished by maintaining safe and efficient air traffic operations, upholding stringent aviation safety standards, promoting Singapore's growth as a global air hub, and providing robust contingency planning and crisis management.

#### **AVIATION CONNECTIVITY AND AIR TRAFFIC**

Understanding air traffic patterns and connectivity is essential for the strategic planning and development of air traffic management systems, airport infrastructure and aircraft operations. Effective management of airspace, especially as flight volumes and connectivity increase, helps minimise congestion and ensures a balanced workload for air traffic controllers, while also minimising greenhouse gas emissions. By maintaining efficient operations, aircraft turnaround times are optimised, passenger satisfaction is enhanced, and both airlines and airport operators can enjoy stronger demand and revenue growth.

As the regulatory authority overseeing Singapore's Aviation Sector, CAAS is committed to ensuring the industry is well-positioned to meet both current and future air travel demands in a sustainable manner. To this end, CAAS has adopted a systematic and collaborative approach that prioritises operational improvements, including the optimisation of flight routes, aircraft operations, and airport systems.

#### Liberal Exchange of Traffic Rights

To strengthen Singapore's position as a premier air hub and support sustainable growth, CAAS actively pursues liberal air traffic rights with partners worldwide. These negotiations facilitate the development of new city links and attract a diverse range of airlines to operate in Singapore, reinforcing its position as a leading aviation and global trading hub.

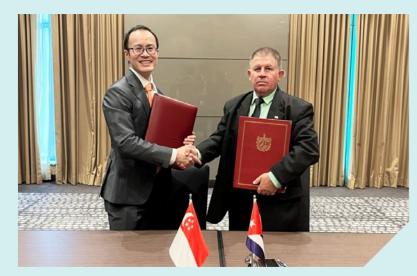
In 2024, CAAS signed its first Air Services Agreement (ASA) with Cuba, and upgraded its agreements with six countries - Dominican Republic, Kazakhstan, the Philippines, Seychelles, Switzerland and Ukraine. These agreements provide airlines greater flexibility in capacity, frequency, routing, and intermodal code-sharing arrangements, thereby enhancing overall connectivity. Today, Singapore has concluded Air Services Agreements with over 140 countries and territories, reflecting its commitment to expanding global connectivity and supporting long-term growth in sectors such as logistics, finance, and manufacturing.

On the air connectivity front, Changi Airport is now connected to about 170 cities worldwide through around 100 airlines, including eight new carriers that commenced operations at Changi Airport in 2024. CAAS aims to build a larger network of 200 city links by the mid-2030s to further advance Singapore's global reach and drive growth in key sectors such as logistics, finance, and manufacturing.



#### Expanding Global Connectivity through Air Services Agreements (ASA)

In 2024, CAAS advanced Singapore's global connectivity by concluding a series of significant Air Services Agreements (ASAs) with international partners.



> Signing of an Air Services Agreement with Cuba

#### **New ASA with Cuba**

Singapore signed its first ASA with Cuba. This agreement allows airlines from both countries to operate air services without restrictions on capacity, frequency, or routing, laying the foundation for future connectivity between the two nations.



Signing of an Air Services Agreement with Kazakhstan

#### **Upgraded ASA with Kazakhstan**

The revised agreement now permits airlines to carry passengers and cargo via any intermediate points and to any beyond points, without restrictions on aircraft type, capacity, or routing. This enables airlines to optimise their networks, improve operational flexibility and tap into new commercial opportunities. Previously, operations were limited to direct services between the two countries.

#### Upgraded ASAs with Dominican Republic, Philippines, Seychelles, Switzerland and Ukraine

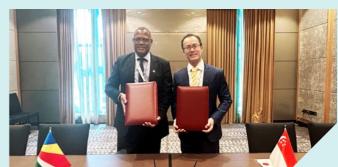
These replace agreements concluded in 2016 (Dominican Republic), 2015 (the Philippines), 2012 (Seychelles), 1969 (Switzerland) and 2011 (Ukraine), aligning them with current industry needs. Enhancements include:

- Updated administrative procedures to streamline regulatory processes.
- Provisions for intermodal code-sharing with surface transport providers, improving multimodal connectivity and business opportunities.











Clockwise from the top: The signing of enhanced Air Services Agreements with the Philippines, Seychelles, Switzerland, Ukraine and the Dominican Republic

#### Driving Operational Efficiency through Free Route Operations (FRTO)

In October 2023, CAAS took a major step toward enhancing operational efficiency and reducing environmental impact by formalising an agreement with Air Navigation Service Providers (ANSPs) from Indonesia and New Zealand, along with the Civil Air Navigation Services Organization (CANSO) and the International Air Transport Association (IATA), to launch the South-East Asia-Oceania Free Route Operations (FRTO) Project. Airservices Australia joined the initiative in July 2024, further strengthening regional collaboration.

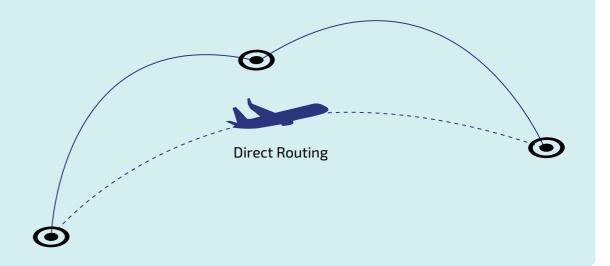


> Signing the Letter of Intent for South-East Asia-Oceania Implementation of FRTO

The FRTO concept allows airlines to plan more efficient flight trajectories by considering factors such as weather conditions and airspace availability. This flexibility optimises the efficiency of flights, thereby reducing fuel consumption and lowering greenhouse gas emissions. While Trajectory-Based Operations (TBO) remains a long-term goal, FRTO offers an immediate, practical solution to advance seamless Air Traffic Management (ATM) through operational collaboration.

As part of the project, 38 city pairs were identified for an operational trial, which commenced on 5 August 2024. In the first five months of the trial, three airlines recorded a total of 614,966kg in fuel savings and 1,394,134kg in carbon emissions savings. Although the full impact will be assessed at the end of the trial, early projections indicate significant sustainability benefits.

CAAS has also implemented Direct Route Operations (DRO)—a foundational building block for FRTO—demonstrating its leadership in advancing ICAO's Aviation System Block Upgrades (ASBU). This proactive approach positions Singapore at the forefront of regional efforts to deliver greener, and more efficient air traffic management.



## Other Operational Improvements to Increase Efficiency and Reduce Fuel Burn

Air Traffic Management (ATM) initiatives play a critical role in advancing both operational efficiency and environmental sustainability. By enabling more direct routings and optimising flight trajectories, these measures help reduce track miles and flight durations—allowing airlines to conserve fuel, passengers to enjoy shorter travel times, and the aviation sector to lower its carbon footprint. When applied across thousands of flights, the cumulative benefits are significant.

Over the next five years, CAAS will roll out three major initiatives aimed at achieving an estimated 10% reduction in additional fuel burn and associated emissions:



#### Advanced Demand-Capacity Balancing

Enhance the management of air traffic relative to available capacity through better coordination of longhaul flights and predictive weather tools to support decision-making.

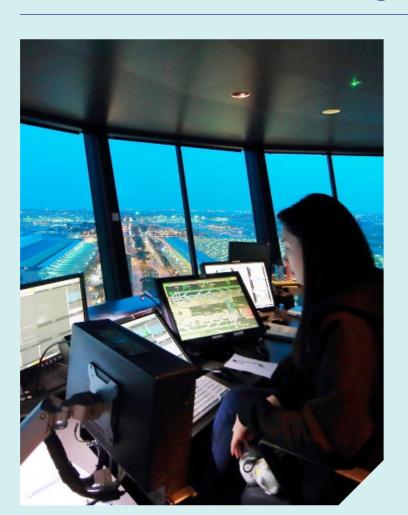


Expand direct routings in collaboration with regional ANSPs and work towards introducing Free Route Airspace for optimised capacity and flexible trajectories. Develop smart tools to optimise descent profiles at Changi Airport, reducing fuel burn and emissions.

Gate-to-Gate Trajectory
Optimisation

Implement enablers for Trajectory-Based Operations and decision-support tools to optimise departure intervals, improving runway efficiency and reducing delays.

#### Leveraging Predictive Weather Solutions for Sustainable Air Traffic Management



The MET-ATM solution enables CAAS to anticipate adverse weather conditions and adjust air traffic flows accordingly

Weather disruption is among the primary contributors to flight delays, often resulting in extended holding patterns and re-routing as flights circumnavigate adverse weather conditions—factors that increase fuel burn and carbon emissions. To address this challenge, CAAS, in collaboration with MITRE and the Meteorological Service Singapore (MSS), is developing an integrated Meteorology-Air Traffic Management (MET-ATM) solution that combines advanced forecasting models with decision-support tools to improve operational efficiency and sustainability.

#### **CORE CAPABILITIES AND INNOVATIONS**

#### **Predictive Weather Models**

These models forecast adverse weather conditions and their impact on air traffic flows up to 8 hours ahead in the enroute airspace, enabling CAAS to anticipate capacity impact and implement flow management measures when necessary.

#### High-Resolution Weather Avoidance Field (WAF)

Tailored for approach airspace around Changi Airport, WAF uses radar and lightning data to provide constraint forecasts, impact assessments, and mitigation recommendations, offering forecasts up to 2 hours ahead.

#### **Wind Shift Forecasting and Mitigation**

Rapid wind direction changes during thunderstorms result in runway reconfiguration changes and reduces capacity. The MET-ATM solution predicts the timing, duration, and recovery of wind shifts, allowing timely decisions that preserve runway throughput and minimise delays.

#### **Climatology of Wind Shifts**

By analysing over 30 years of weather data, the system identifies patterns and atmospheric conditions that drive wind shifts, supporting smarter planning and more resilient operations.

The MET-ATM solution could potentially transform how air traffic is managed during adverse weather. By providing accurate, real-time forecasts and actionable insights, it enables CAAS to anticipate disruptions and adjust traffic flows proactively, reducing the need for airborne holding. The high-resolution WAF model aims to provide insights into potential weather impacts on air traffic and possible recommendations needed to fine-tune mitigation tactics and decisions in the approach airspace. Meanwhile, wind shift forecasting tools aims to minimise unnecessary runway configuration changes, improving airport throughput and overall operational efficiency during adverse weather conditions.

Together, these innovations deliver a data-driven approach to air traffic management, ensuring that flights operate more predictably and efficiently—even in challenging weather conditions. The result is fewer delays, lower fuel consumption, and reduction in greenhouse gas emissions, reinforcing CAAS' commitment to sustainable aviation growth.

#### Driving Air Traffic Innovation through the CAAS-Thales International Avionics Lab

To strengthen Singapore's position as a global aviation hub and advance sustainable air traffic management, CAAS is partnering with Thales to establish the International Avionics Lab in Singapore—the first of its kind outside France. On 29 May 2025, CAAS, Thales, the Changi Airport Group (CAG), SATS Ltd. (SATS), Singapore Airlines (SIA) and the International Centre for Aviation Innovation (ICAI) signed a Memorandum of Understanding (MOU) to collaborate on the International Avionics Lab and jointly explore, initiate and undertake avionics innovation projects. Scheduled to start in 2026, the lab will initiate projects to develop next-generation avionics solutions designed to enhance air traffic management (ATM) and airport operations across the Asia-Pacific region and beyond.



> Signing of the MOU between CAAS, Thales, CAG, SATS, SIA and ICAI to collaborate on the International Avionics Lab

#### **Building Local Capabilities and Global Leadership**

The initiative will also grow Singapore's expertise in **avionics**, **AI**, **and cybersecurity**, creating new opportunities for the local workforce and reinforcing Singapore's role as a hub for aviation innovation. By fostering collaboration within Singapore's **One Aviation ecosystem**, the lab will accelerate the development of scalable solutions that improve efficiency, reduce emissions, and support sustainable growth in global air transport.



This pioneering initiative positions us at the heart of a dynamic ecosystem, accelerating the development of breakthrough collaborative solutions.

**Ms Yannick Assouad** EVP Avionics, Thales

## Sustainable Air Traffic Management



By working hand in hand with our counterparts across the region, we are committed to making our skies safer, greener, and more efficient for all who travel.

**Hermizan Jumari**Deputy Director (Plans)



Mr. Hermizan Jumari leads a team of air traffic services planners who oversee airspace management, planning and designing new air routes to ensure smooth and efficient traffic flows where Singapore provides air navigation services.

Designing efficient air routes is like building highways in the sky and contributing to the safety and effectiveness of air travel are highlights of his role. He finds great fulfilment in collaborating with other air traffic management professionals from the region, uniting around a shared vision to make the skies safer and more efficient for everyone.



#### **AVIATION SAFETY**

Aviation safety is central to CAAS' mission to build a safe and vibrant air hub that contributes to Singapore's continued success.

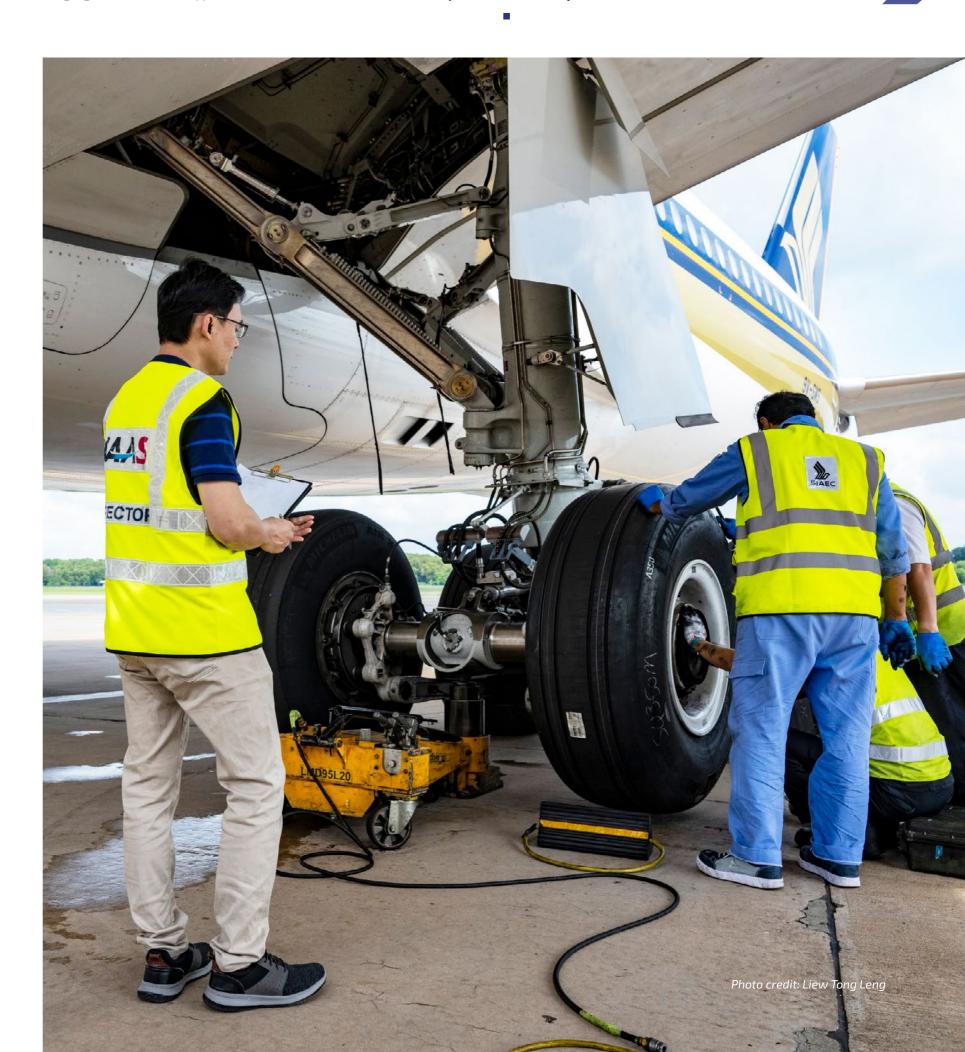
The Asia-Pacific region is projected to be among the fastest-growing aviation markets over the next two decades, presenting significant opportunities for growth. However, our operating environment is becoming increasingly complex, with challenging trade dynamics, and an aging workforce amongst factors creating new pressures on the industry.

To navigate these challenges whilst capturing growth opportunities, CAAS' focus on safeguarding operational safety, streamlining regulatory processes, strengthening capabilities and safety culture across the aviation ecosystem ensures that our regulatory regime remains both robust and progressive, and positions Singapore's aviation sector for sustainable growth.

## Strengthening Aviation Safety for Sustainable Growth

CAAS promotes a strong culture of collective responsibility that encourages all stakeholders, government agencies, aviation companies and aviation personnel, to take ownership and play their parts to maintain the high safety standards expected of our aviation industry. The State Safety Programme (SSP) is a critical component of this effort, guiding the sector through clear safety policies and objectives to build a safe and resilient aviation system.

Singapore's National Aviation Safety Plan (NASP) complements the SSP. It presents a joint action plan, whereby once every three years, government agencies, aviation companies and aviation personnel work together to review the operating environment, identify emerging safety risks and take coordinated actions to address them. The NASP 2025 – 2027 focuses on four strategic priorities that will drive safety initiatives over the next triennium: enhancing operational safety, reviewing and developing policies and rules, strengthening safety management and safety culture, and developing human capital. These priorities provide a structured approach for ensuring that Singapore's aviation sector grows safely and sustainably.



#### **Building a Positive Aviation Safety Culture**

A strong and positive safety culture is the foundation of Singapore's aviation sector's resilience. To support the strengthening of our aviation sector's safety culture, CAAS embarked on the development of a Handbook on Aviation Safety Culture, curated specially to address the challenges and needs of our local operating environment. The handbook introduces the Singapore Aviation Safety Culture Framework, providing practical guidance for both management and operational personnel on how to cultivate and sustain a positive safety culture. It includes real-world case studies, industry anecdotes and a set of dos and don'ts that illustrate how safety can be embedded in day-to-day operations.

The handbook emphasises the critical role of management in creating a psychologically safe environment where safety can flourish. It also empowers individuals to take ownership of safety in their daily work and conduct themselves professionally with safety at the forefront. Developed in collaboration with industry partners and tailored to Singapore's operating context, the handbook bridges the gap between theoretical safety culture concepts and their practical application. It aims to align both management and operational personnel on the mindsets, attitudes and values necessary to sustain a positive safety culture.



Aviation Safety is the responsibility of all organisations and individuals across all levels, and a culture which values and prioritises safety is essential to assure effective safety management and better aviation safety performance.

From Charter for a strong and Positive Safety Culture in Singapore



#### Tell Sarah

Designed to encourage responsible and confidential reporting, "Tell Sarah" enables aviation professionals to share observations of hazards or unsafe practices that could compromise safety. Reports can be submitted easily and securely.

Through "Tell Sarah," CAAS demonstrates its commitment to engaging all aviation players—from frontline staff to service providers—in a shared mission to enhance safety. By providing a trusted channel for voluntary reporting, CAAS fosters transparency, accountability, and continuous learning, reinforcing a safety-first mindset throughout Singapore's aviation community.



CAAS' "Tell Sarah" platform



#### **Advancing Aviation Safety Regionally**

Given that aviation safety is a collective effort, CAAS also remains committed to supporting regional and international aviation safety platforms and capacity building initiatives in collaboration with ICAO and other international organisations.

The Asia-Pacific Summit for Aviation Safety (AP-SAS) is an annual safety event co-organised by CAAS and the Flight Safety Foundation (FSF) to provide a platform for aviation leaders, regulators and safety professionals from the Asia-Pacific region and beyond to engage in critical discussions, share insights and collaborate on solutions to strengthen aviation safety in the rapidly evolving global aviation landscape.

In August 2024, CAAS co-organised the Asia-Pacific Summit for Aviation Safety 2024 with the Civil Aviation Administration of China (CAAC) and FSF. Themed "Shaping Safety Excellence: A Human-Focused Approach", the summit focused on how a human-centred approach could enhance safety outcomes across the industry. The event emphasised the need for both individuals and organisations to proactively tackle safety challenges in a way that leads to more sustainable, impactful and effective safety solutions.

Over 450 aviation leaders and professionals, including regulators, airlines, aircraft manufacturers, air navigation service providers, maintenance organisations and aerodrome operators, participated in the summit. They took stock of key developments impacting the aviation sector, sharing valuable lessons that would ultimately bolster aviation safety. This event highlighted the importance of integrating human factors into safety management, reinforcing the idea that a positive safety culture starts with the people at the heart of aviation operations.

In October 2024, CAAS and Civil Aviation Authorities (CAAs) from Indonesia, Malaysia, the Philippines and Thailand launched the first regional data-sharing initiative in this region. This initiative was first mooted at the inaugural AP-SAS held in Singapore in 2023. With shared commitment to achieve better safety outcomes for all, the five CAAs agreed to share de-identified safety data and information to make clear safety hazards and trends, which would in turn aid the development of mitigating measures. The CAAs established a list of safety data and information for sharing and the protocols that would govern data confidentiality and commenced the data and information sharing from December 2024.

CAAS also actively supports regional safety improvements through international and regional platforms such as the Regional Aviation Safety Group-Asia Pacific (RASG-APAC) and the Asia Pacific Regional Aviation Safety Team (APRAST). These regional forums enable us to work collectively with regional partners to jointly identify and address common aviation safety challenges.







## **Embedding Safety Standards** in Air Navigation Services

As an Air Navigation Service Provider (ANSP), CAAS' Air Navigation Services Group (ANSG) adopts a comprehensive Safety Management System (SMS) to uphold high safety standards and foster a proactive safety culture across Singapore's airspace operations. The SMS is structured around four key components: Safety Policy & Objectives, Safety Risk Management, Safety Assurance, and Safety Promotion. These elements collectively guide the development of safety policies, risk mitigation strategies, performance monitoring, and continuous learning.

- Safety Policy & Objectives form the foundation, with strong management commitment, clearly defined safety accountabilities, and coordinated emergency response planning. These are supported by formal documentation and oversight through key safety action groups.
- Safety Risk Management focuses on identifying hazards and assessing risks, enabling targeted mitigation strategies that address both current and emerging safety concerns.
- Safety Assurance ensures that safety performance is continuously monitored and measured. It includes robust change management processes and a commitment to ongoing improvement, allowing the system to adapt effectively to operational developments.
- **Safety Promotion** reinforces the safety culture through training, education, and clear communication, ensuring that safety remains a shared responsibility across all levels of the ANS ecosystem.





#### **RISK MANAGEMENT**

CAAS adopts a structured approach to risk management, guided by its Enterprise Risk Management (ERM) framework. To minimise disruptions, CAAS conducts regular risk reviews, addresses emerging risks through dedicated workgroups, and maintains robust business continuity and crisis management plans. Scenario planning, stress testing, and strong internal controls further strengthen operational resilience. When incidents occur, CAAS activates clear response protocols, monitors corrective actions, and incorporates lessons learned to improve future readiness. Beyond mitigating risks, CAAS also identifies and acts on strategic opportunities, ensuring the organisation remains agile, resilient, and aligned with its long-term goals.

CAAS has developed a comprehensive ERM framework through extensive stakeholder engagement, involving risk owners, the ERM Committee (ERMC), and the Audit and Risk Committee (ARC). This methodology employs a systematic three-tier governance structure to ensure a robust approach in managing enterprise risks. The risk governance framework at CAAS operates through a multi-tiered structure designed to ensure comprehensive oversight and management of enterprise risks.



#### **Audit Risk Committee (ARC)**

At the Authority level, the ARC provides overarching governance and oversight, ensuring that ERM practices align with CAAS' strategic objectives and regulatory requirements.





#### **Enterprise Risk Management Committee (ERMC)**

The ERMC serves as the central coordinating body, reviewing CAAS' overall risk profile, determining its risk appetite, and evaluating the effectiveness of the ERM framework.





#### **Risk Workstreams**

At risk owner level, Risk Workstreams are led by designated risk owners who contribute their domain-specific expertise to identify, assess, and implement mitigation strategies within their respective areas.

#### **Enterprise Risk Management Methodology**

CAAS' ERM process follows a structured, annual cycle that ensures comprehensive risk oversight through continuous improvement and strategic alignment. The methodology encompasses risk identification and prioritisation, detailed assessments, methodology refinement with objective parameters and risk ratings, review of key risks and indicators, and formal approval of the finalised risk profile.

To minimise the likelihood and impact of potential disruptions, CAAS implements comprehensive risk management measures. Scenario planning and stress testing exercises, such as Exercise Bobcat, prepare the organisation for complex or high-impact events, while strong internal controls and compliance mechanisms safeguard operational integrity.

When challenges do arise, CAAS activates clear and coordinated response protocols. These include predefined incident response protocols, crisis management teams with designated roles, and structured monitoring of corrective actions. Root cause analyses identify underlying issues, while lessons learned are systematically documented and integrated to strengthen future responses. The risk register outlines 11 Top Risks, spanning enterprise-level concerns across key areas: operational continuity, safety and security, strategic positioning, financial sustainability, and information and cyber resilience. These risks reflect critical challenges that could impact CAAS' ability to deliver safe, efficient, and internationally respected civil aviation operations in Singapore. CAAS maintains a robust and disciplined risk management process that supports its mission of enabling a safe, vibrant, and sustainable air hub.





Exercise Bobcat to test the airport's emergency and incident management plans

#### Cybersecurity as a Strategic Risk Response

The cyber threat landscape is constantly evolving, exposing enterprises to sophisticated tactics, techniques, and procedures (TTPs) that could disrupt essential services and compromise data, resulting in operational and reputational impact. To mitigate these enterprise risks, CAAS implements the following defensive measures against such cyber threats:

#### Identify

• Maintain up to date inventories of IT assets so that critical assets are identified and protected

#### **Protect**

- Strict access control mechanisms to manage accounts, data, and services
- Cybersecurity awareness programme to educate staff on cybersecurity and data security risks
- Vulnerability management process to manage and remediate discovered vulnerabilities
- Regular audits on systems to review and assess cybersecurity and data security risks

#### **Detect**

- Anti-malware solutions to protect systems
- Active monitoring of networks and systems to provide situational awareness of agency's cybersecurity posture

#### **Respond and Recover**

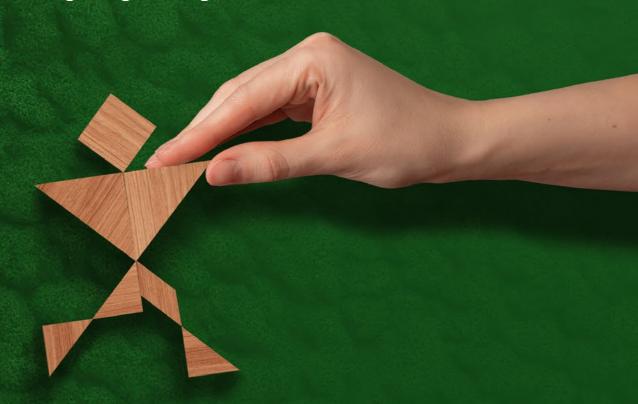
- Backup processes and recovery plans to enable systems to be restored properly when required
- Incident management plans for cybersecurity and data incidents

It is important to note that everyone plays a part in cybersecurity. To ensure good cyber hygiene, individuals should stay vigilant against phishing and social engineering, practice good cyber hygiene such as the use of strong passwords, enabling two-factor authentication, updating devices and applications promptly, and reporting cyber incidents quickly.



## Building a Resilient and Sustainable Workforce

As the aviation industry continues to grow, it is essential to build a sustainable workforce through transformation with integration of technology-driven support to meet the evolving demands of a growing aviation landscape. CAAS as the sector lead, prioritises employee well-being and professional development, as well as maintaining strong internal governance.





## SECTOR WORKFORCE TRANSFORMATION: BUILDING A FUTURE-READY AVIATION WORKFORCE

Workforce transformation is essential to maintaining Singapore's position as a leading global air hub and to achieving its long-term sustainability goals.

Singapore's aviation sector is powered by a workforce of over 60,000 professionals, a number that is expected to grow with rising air travel demand. As the industry expands, its jobs and skills will also evolve in response to megatrends such as digitalisation, automation, artificial intelligence, and sustainability imperatives. As identified in the inaugural 2025 Aviation Jobs Transformation Report, up to 30% of aviation jobs may undergo redesign and transformation over the next five years. This will create new and exciting career pathways across the sector.

CAAS is working closely with fellow government agencies, tripartite partners and educational institutions to accelerate workforce transformation for the sector. Specifically, to identify emerging skills, redesign jobs, curate training programmes and establish clear career pathways. These policies and procedures are designed to ensure that aviation professionals are equipped with the competencies needed to meet future operational and sustainability needs.

To strengthen workforce resilience and ensure that aviation professionals remain competitive and adaptable, CAAS and its partners have rolled out a suite of initiatives that promote skills development and lifelong learning. By investing in people and fostering a culture of continuous learning, CAAS is building a future-ready workforce that will support Singapore's aviation sector in remaining globally competitive and sustainable for decades to come. You can find the Aviation Jobs Transformation Report here.



## One Industry. Many Opportunities.

#### **OneAviation Manpower Programme**

CAAS established the \$200 million OneAviation Manpower Programme in 2025. This programme is part of a broader \$1 billion commitment to catalyse action across connectivity, infrastructure, technology, and manpower over the next five years. The programme will provide targeted support for initiatives that attract, develop, and retain talent across the aviation ecosystem. It will enable job redesign, reskilling, and career development programmes, and will be implemented in close partnership with unions, employers, and education institutions. By investing in workforce transformation, the fund ensures that aviation growth translates into meaningful opportunities for Singaporeans and strengthens the sector's long-term competitiveness.



> Job Redesign Playbook for Aviation

#### **Job Redesign Playbook for Aviation**

The Job Redesign Playbook for Aviation was launched in 2025 to support employers in navigating workforce transformation. Jointly developed by the Institute for Human Resource Professionals (IHRP) and Workforce Singapore (WSG), in close collaboration with SAAA@Singapore and CAAS, this resource equips enterprises with practical tools and frameworks to implement job redesign effectively. The playbook ensures that workforce transformation creates higher-value roles, establishes sustainable career pathways and enhances job attractiveness across the sector. The playbook also empowers both employees and job seekers to assess their career readiness and discover emerging aviation job roles that align with their career aspirations.

#### **Collaboration with Educational Institutions**

To develop a strong pipeline of aviation professionals, CAAS signed a Memorandum of Understanding (MOU) on Aviation Talent Development in 2025 with nine Institutes of Higher Learning (IHLs): Institute of Technical Education (ITE), Nanyang Polytechnic (NYP), Ngee Ann Polytechnic (NP), Republic Polytechnic (RP), Singapore Institute of Technology (SIT), Singapore Polytechnic (SP), Singapore University of Social Sciences (SUSS), Singapore University of Technology and Design (SUTD), and Temasek Polytechnic (TP).

Under this MOU, CAAS and the IHLs committed to three key areas of collaboration:

#### Develop Education Capabilities and Programmes

Bringing together the aviation sector and educational institutions to systematically design curricula that meet future manpower needs. This includes identifying training requirements with industry partners and offering structured internships and in-house training opportunities.

#### Expand Course Offerings and Training Infrastructure

Introducing new specialisation tracks in Pre-Employment Training programmes, targeted Continuing Education and Training programmes for mid-career transitions and enhancing training facilities to support advanced aviation learning.

#### Create Greater Career Awareness

Promoting aviation careers through career fairs, structured career guidance services, and scholarship programmes to attract both students and mid-career individuals to opportunities in conventional and emerging areas of aviation.



📂 Visit to Temasek Polytechnic training facilities by Senior Minister of State for Transport and National Development, Ms Sun Xueling

#### **Technology and Innovation Partnerships**

To signal the sector's commitment to invest in AI and technology, CAAS signed a MOU on Aviation AI Capability and Talent Development in 2025 with AI Singapore, Changi Airport Group, SATS, and Singapore Airlines. This strategic collaboration will enable joint efforts in AI promotion, adoption, and talent development. It will also aim to co-develop technology solutions that enhance productivity and create new roles in areas such as autonomous vehicle supervision and AI-driven resource optimisation.

There are three key streams under this collaboration:

#### Establishing an Aviation AI Community of Practice

A formal structure has been created to bring the aviation ecosystem together, enabling stakeholders to co-develop AI solutions for aviation use cases and foster knowledge sharing. This initiative promotes sector-wide AI adoption and accelerates innovation.

#### Building a Pool of AI Talent

Leveraging AI Singapore's networks and programmes, the partnership focuses on upskilling in-sector professionals and training new AI talents entering the aviation industry. This ensures a steady pipeline of AI-skilled workers to support future operations.

#### Co-developing an Aviation-focused AI Roadmap

The roadmap identifies shared strategic priorities, key enablers, and desired sector-wide outcomes. It also provides flexibility for individual aviation partners to explore and implement AI initiatives that align with these priorities and deliver operational value.

# ONEAVIATION CAREERS & EDUCATION 2025

Memorandum of Understanding on Strategic Collaboration in Aviation Al Capability and Talent Development













> Signing of the MOU on 'Strategic Collaboration in Aviation AI Capability and Talent Development'

## CAAS EMPLOYEE WELL-BEING AND DEVELOPMENT

CAAS is committed to nurturing a future-ready workforce that is agile, resilient, and equipped to meet the evolving demands of the aviation sector. This commitment is reflected in a comprehensive management approach that integrates career development, competency building, and holistic well-being support. A skilled and motivated workforce not only enhances resilience but also enables the organisation to adapt swiftly to change. At the same time, the demanding nature of aviation roles—particularly those involving safety-critical functions—can present challenges such as fatigue, stress, and talent attrition if not proactively managed.

To this end, CAAS has implemented a structured framework that integrates career development, competency building, and holistic well-being support. Career planning is supported through initiatives such as Structured Career Conversations, which provide personalised guidance for employees at various

stages of their professional journey. Targeted in-house programmes further strengthen performance management and leadership capabilities across the organisation. To ensure systematic capability building, CAAS is developing functional competency frameworks, including Technical Career Pathways, which offer clear progression routes and support long-term workforce development.

Operational excellence is a key focus, particularly for roles that are critical to aviation safety. Air traffic controllers, who make up a significant portion of CAAS' workforce, undergo rigorous and continuous training to maintain their proficiency in managing complex air traffic scenarios. Their expertise is essential to the safe and orderly flow of air traffic within Singapore's airspace, and their performance directly contributes to Singapore's reputation as a leading aviation hub.





In parallel with technical and career development, CAAS places strong emphasis on employee well-being. The organisation adopts a holistic approach that encompasses physical, mental, and social wellness.

CAAS also fosters strong relationships and a sense of community through initiatives such as Family Day, Bring Kids to Work Day, and Activity Interest Groups that encourage bonding within and beyond the workplace. Regular initiatives such as Work Flexibly@CAAS, Monthly Fruit Day, Wellness Wednesdays further support employees' well-being, while the Wellness Ambassador Framework enables peer support across departments. These efforts collectively strengthen engagement, morale, and a sense of belonging across the organisation.

Employees are also actively engaged to co-create solutions and provide feedback via townhalls, surveys, and consultative platforms. CAAS actively tracks the effectiveness of its initiatives and adjusts them based on pilot runs and employee suggestions.

#### Overview of CAAS' Workforce Profile

As of FY24/25, there are close to 1,400 CAAS officers in Singapore. This section presents the workforce profile, including gender breakdown across all staff, employee turnover, and new hires.

Diversity of Employees	<ul><li>All Employees</li></ul>	Male: 59%	Female: 41%
(Gender)	■ New Hires	Male: <b>64%</b>	Female: 36%
	■ Turnover	Male: <b>67%</b>	Female: 33%



**824** in FY24/25



**570** in FY24/25

All CAAS officers are full-time, permanent employees



## **CAAS Employee Well-being and Development**

CAAS adopts a comprehensive and proactive approach to employee well-being, recognising that a healthy, supported workforce is essential to sustaining operational excellence and long-term organisational resilience. The organisation's well-being strategy encompasses medical benefits, preventive health initiatives, workplace wellness programmes, and family care support—ensuring that employees are holistically cared for across different life stages and needs.

To promote preventive health, CAAS has partnered with a medical service provider to offer complimentary basic health screenings and discounted corporate packages tailored to individual health needs. Officers



Talks on maintaining mental well-being amidst a hectic lifestyle

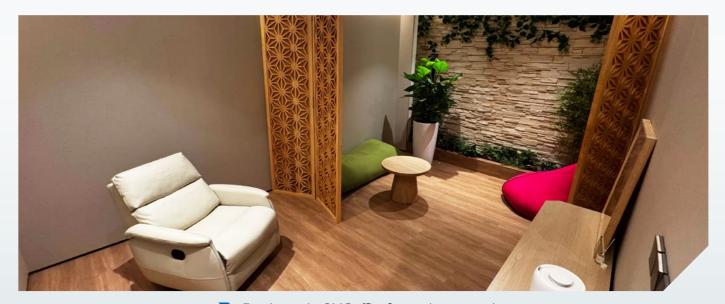


Zumba session conducted at the CAAS office

aged 40 and above are supported in their participation in the Ministry of Health's Healthier SG initiative, including the provision of half-day leave to complete their first health plan consultation. These efforts encourage early detection and long-term health management, aligning with national public health goals. Workplace wellness is further supported through the Wellness Wednesdays initiative, which includes regular health talks, workshops, and physical activities aimed at promoting mental and physical well-being. Monthly Fruit Day encourages healthier snacking habits and serves to promote nutritional awareness in the workplace.



Monthly Fruits Day, where fresh fruits are distributed to employees



**>** Zen den at the CAAS office for employees to relax

Photo credit: Liew Tong Leng



#### CAAS Workplace Transformation – Designing a Future-Ready, People-Centric Workplace

From September 2023 to March 2025, CAAS undertook a comprehensive Workplace Transformation Project to modernise its office environment and better support evolving operational and employee needs. The new workspace consolidated the offices into a 13,300 sqm space at Terminal 2 to improve workplace synergy with innovative spatial design as well as flexible and modular furniture to cater for future growth, incorporating advanced digital technologies to support hybrid work arrangements.

Symbolising unity and excellence, the transformed workspace was designed to enhance operational integration and strengthen organisational cohesion. It embraces technology and connects our people and working partners through an open office concept with more meeting rooms, collaborative spaces, wellness areas, inspiring artworks and photo spots throughout the office to encourage teamwork, spontaneous interactions and an innovative spirit, whilst enabling staff to recharge when needed.

The workplace was co-created with employees, fostering a sense of ownership and pride, prioritising staff well-being, inclusivity, and adaptability through flexible layouts and modular spaces tailored to diverse work styles. The transformation ensured the workplace design reflected employee needs and preferences, enhancing staff retention by promoting comfort and inclusivity. Extensive engagement and consultation activities, involving employee across the project stages. Engagement approaches

included surveys, focus group discussions, cascade briefings, roadshows, and office tours, with furniture selection, collaboration zones, and wellness areas equipped based on staff feedback.

The workplace design prioritises employee well-being through dedicated wellness zones and quiet pods. These spaces offer employees areas to recharge, focus, or engage in informal interactions, contributing to a healthier and more supportive and staff wellbeing work culture.

Technology played a key role in enabling hybrid work and improving collaboration. To enhance hybrid collaboration and communication clarity for both internal and external stakeholders, CAAS equipped large meeting rooms with voice-lift systems and deployed sound masking technologies in open office areas, ensuring speech privacy and a comfortable work environment. All meeting rooms feature MS Teams-enabled video conferencing systems with speaker tracking and digital flipboards, enabling seamless virtual engagement. Integrated resource booking systems further streamline scheduling and maximise meeting room utilisation, improving operational efficiency. The new workplace has improved staff experience by offering a more comfortable, flexible, and engaging environment. It supports a healthier work-life balance, encourages collaboration, and reflects CAAS' commitment to build a resilient and future-ready organisation.



CAAS also provides a robust suite of family-friendly leave provisions to support employees in managing caregiving responsibilities. These include:

- **Parental Leave Schemes:** Covering maternity, paternity, adoption, and shared parental leave, with flexible arrangements to accommodate both biological and adoptive parents.
- **Childcare Leave:** Granted on a per-parent basis for officers with children, including naturally born, adopted, step, or foster children.
- **Family Care Leave:** Up to two days of unrecorded leave annually to care for immediate family members, including parents, grandparents, siblings, legal guardians, and children not covered under Childcare leave.
- **Unpaid Infant Care Leave:** Up to 12 days of leave over two years for officers with children under the age of two, with an additional four weeks of unpaid leave available.

Unpaid Leave for Unexpected Care Needs: Up to four weeks of leave annually for officers with children who are born preterm, have congenital conditions, are part of multiple births, or require special care; and up to two weeks of leave for caring for hospitalised immediate family members.

These provisions reflect CAAS' recognition of the diverse caregiving responsibilities employees may face and its commitment to enabling work-life integration. In addition, CAAS acknowledges long-term service through its Retirement Gift Scheme, which serves as a gesture of appreciation for employees transitioning into retirement, reinforcing a culture of respect and recognition.

Through these initiatives, CAAS demonstrates its commitment to creating a supportive and nurturing environment that prioritises the health, family life, and overall wellbeing of our employees, ultimately contributing to a positive workplace culture.





### **Upskilling and Developing Employee Talent**

CAAS is committed to equipping its workforce with the skills and knowledge needed to thrive in a rapidly evolving aviation landscape. To achieve this, CAAS offers a comprehensive suite of programmes that address technical expertise, digital readiness, leadership development, and continuous learning. Employees also undergo regular performance and career development reviews as part of their professional growth journey. In FY24/25, 100% of employees undertook a performance review.



## JOB-SPECIFIC TRAINING

Job-specific training programmes form the foundation of this effort, including targeted workshops, industry conferences, and instructor-led courses that enhance immediate work performance. For safety-critical roles, specialised training in safety regulatory functions ensures compliance with ICAO audits and international standards.



## TECHNICAL CERTIFICATIONS

Relevant officers undergo professional certification programmes and industry-recognised examinations that validate technical competencies and specialised knowledge required for specific functions within CAAS. This reinforces credibility and aligns with global aviation industry standards.



#### DIGITAL & CYBERSECURITY SKILLS

CAAS prioritises core digital and cybersecurity skills for all employees, focusing on digital awareness and improving work productivity through secure digital solutions and modern workplace technologies.



## LEADERSHIP & CAREER DEVELOPMENT

**CAAS** invests in organisation-wide core skills development, including performance management, career planning, and leadership training. These programmes strengthen individual effectiveness and support career progression across all levels. For high-potential officers, CAAS sponsors Postgraduate Master's programmes to deepen functional expertise or broaden strategic and leadership exposure.



#### CONTINUOUS LEARNING SPONSORSHIP

CAAS implements a
Continuous Learning
Policy, offering financial
sponsorship for approved
courses at universities,
polytechnics, and other
institutions. Officers
may also apply for
partial reimbursement
of compulsory course
fees, examination costs,
and related educational
expenses.

## Pursuing Her Passion for Sustainability



I hope to be able to shape the industry in a way that is more sustainable and inclusive for future generations.

Ms Chua Sin Ying Senior Assistant Director, Sustainability Office



Fascinated by aviation since secondary school, Ms Chua Sin Ying believes that safeguarding and growing Singapore's aviation sector is crucial for Singapore's economic survival and progress. Guided by this conviction, she embraced opportunities offered through CAAS' career development philosophy which encourages officers to broaden their experience through internal postings and external secondment. This philosophy enabled Sin Ying to move from the Air Traffic Management Operations Planning function into a sustainability policy portfolio, aligning her professional development with her personal passion for sustainability. Her experience exemplifies how CAAS supports its people in growing their careers that advance both CAAS' mission and individual commitment to meaningful causes.



## Workplace Safety and Health Management

At CAAS, the safety, health, and wellbeing of employees and stakeholders are safeguarded through a comprehensive Workplace Safety and Health Management System (WSHMS). The system is structured in accordance with the Ministry of Manpower's Workplace Safety and Health Management Provisions) Regulations 2011.



## Workplace Safety and Health Management System (WSHMS)

CAAS maintains a strong commitment to workplace safety and health through its certification under bizSAFE programme, achieving bizSAFE Level 4 accreditation. In alignment with the bizSAFE framework, CAAS has established a comprehensive WSHMS that applies across all divisions and includes all employees and vendors operating within CAAS premises.

BizSAFE audit inspection



> CPR and AED training session conducted for CAAS staff

#### **Occupational Health Programmes**

Key initiatives include the Office Ergonomics Programme, which promotes proper workstation setup to prevent musculoskeletal disorders. First aid and emergency response capabilities are also in place. Qualified first-aiders are appointed to provide immediate on-site treatment and maintain first aid supplies. The quality of these services is maintained through the appointment of competent personnel with recognised qualifications.

#### Hazard Identification, Incident Investigation, and Risk Management

To maintain a safe working environment, workplace safety and health inspections are conducted quarterly across office premises and operational facilities. These inspections follow standardised checklists to ensure consistency.

CAAS has implemented a structured risk management procedure, involving risk assessments that applies to all work activities.

#### **Reporting Hazards and Protection Against Reprisals**

At CAAS, employees are required to immediately report any work-related hazards, unsafe conditions, or incidents to ensure a safe and responsive working environment. Beyond incident reporting, staff are specifically instructed to notify their superiors of any unsafe conditions observed in the workplace. CAAS maintains an open reporting culture, with no recorded cases of reprisals against employees who raise safety concerns. Incidents are shared with the WSH Working Committee for visibility and follow-up, reinforcing a safe and inclusive work environment.

#### **Employee Participation, Consultation, and Communication**

CAAS ensures meaningful worker involvement in workplace safety and health through structured committees, direct engagement, and transparent communication. The WSH Working Committee, a formal joint management-worker body oversees CAAS' WSH matters. It reviews incidents, updates procedures, promotes safety awareness, and facilitates employee input into policy development. Safety information—including policies, procedures, and risk assessments—is communicated via notice boards, intranet, and regular briefings. CAAS works closely with the Amalgamated Union of Public Employees (AUPE) to foster positive workplace relations and employee well-being initiatives, creating a caring, connected workplace community that supports staff members.

#### **Training on Employees' Safety and Health**

CAAS provides structured safety and health training to equip employees with the knowledge and skills needed to work safely, aligned with regulatory requirements and operational needs (e.g. Work at Height Training).

#### **Work-Related Injuries**

In FY24/25, there were zero fatalities and work-related injuries recorded.



## ETHICAL AND FAIR BUSINESS PRACTICES FOR CAAS

Ethical and fair business practices are foundational to CAAS' governance and operational culture. These practices are defined as conducting business with integrity, transparency, and fairness, while ensuring compliance with legal and ethical standards across all areas of operation.

The Internal Audit Division (IAD) provides independent assurance that governance, risk management, and internal control processes are effective and compliant with established policies. The Authority meets bimonthly to deliberate and approve key matters related to governance, operations, policy, and sustainability, reflecting its oversight of material issues. These mechanisms ensure that ethical conduct is embedded throughout the organisation and that material issues are addressed with accountability and transparency.

### Policies for Responsible Business Conduct

#### **Upholding Organisational Ethics and Standards**

CAAS is dedicated to maintaining a culture of integrity and non-corruption within the organisation. The IAD provides independent assurance on governance, risk management, and compliance with established policies and procedures. The IAD also manages a whistleblowing channel accessible to both CAAS officers and the public, enabling the confidential reporting of suspected fraud, misconduct, or unethical behaviour without fear of retaliation. The <a href="https://www.without.com/without/without/">whistleblowing channel</a> is also publicly available on the CAAS website to ensure it is accessible to all stakeholders.

To promote risk awareness and continuous improvement, the IAD publishes the Internal Audit Digest and regularly shares insights and lessons from the Auditor-General's Office (AGO) Report and publicised fraud and corruption cases across the public sector. These initiatives help strengthen internal controls and reinforce ethical standards throughout the organisation.

In FY24/25, CAAS recorded zero incidents of fraud or corruption, reflecting the effectiveness of its ethics and compliance framework. Anti-corruption principles are actively communicated to employees and business partners, ensuring alignment with CAAS' values and expectations.



#### **Fair and Transparent Practices**

CAAS is committed to upholding ethical business conduct and ensuring fairness across its operations and workplace practices. A non-discriminatory work environment is maintained, with human resource policies aligned to the Tripartite Guidelines on Fair Employment Practices. All job applicants receive equal consideration, regardless of ethnicity, gender, religion, nationality, age, or physical ability. Diversity is actively promoted within both the governance body and workforce, recognising the value of inclusive perspectives in shaping a resilient and forward-looking organisation.

CAAS ensures transparency, open and fair competition, and value for money in its procurement practices by adopting a structured process aligned with Singapore Government standards. Procurement is open by default, reinforcing equitable access and accountability in engaging suppliers.

#### **Compliance with Legal and Regulatory Standards**

CAAS maintains a strong commitment to ethical business conduct through rigorous compliance with legal and regulatory frameworks. Its financial statements are prepared in accordance with the Public Sector (Governance) Act 2018, the Civil Aviation Authority of Singapore Act 2009, and the Statutory Board Financial Reporting Standards. Independent auditors verify the accuracy and integrity of CAAS' financial records, expenditures, and asset management practices, ensuring full compliance with applicable laws and regulations. Oversight of workplace safety and health is a key responsibility of the CAAS Management, which monitors the implementation of the WSH framework, and includes the identification and mitigation of climate-related risks. In its procurement practices, CAAS aligns to government instruction manual, including Green Procurement requirements to ensure that goods and services delivered align with public service environmental requirements. In FY24/25,

there was no instance of significant noncompliance with laws and regulations.









#### STAKEHOLDER ENGAGEMENT

CAAS actively engages with international and regional aviation stakeholders by leading and participating in multiple ICAO and Asia-Pacific committees and working groups, strengthening collaboration and advancing sustainability, safety, and performance across the aviation sector. Locally, CAAS also fosters strong relationships with our stakeholders through diverse engagement platforms, enabling us to respond to their concerns effectively and collaboratively. These interactions also provide opportunities to share our initiatives in shaping an aviation sector that prioritises community well-being and sustainability. More details on the stakeholder engagement sessions conducted by CAAS can be found in the table below.

Stakeholder Group	Key Engagement Methods	Purpose of Engagement	Frequency of Engagement
Board Members	■ Board Meetings	<ul><li>Economic growth</li><li>Safety</li><li>Sustainability</li><li>Governance</li></ul>	Regularly
Employees	<ul> <li>Town Halls</li> <li>Staff Intranet Publications</li> <li>Electronic Direct Mail (EDMs), CAAS Circular and Emails on specific issues by respective divisions</li> <li>Whole of Government Employee Engagement Survey and CAAS Pulse Survey</li> <li>Group Engagement Sessions and Brown Bag Sessions by Senior Management</li> <li>Curious Conversations sharing by CAAS Divisions</li> <li>Events and Ceremony (e.g. CAAS Appreciation events and Award Ceremony)</li> </ul>	<ul> <li>Raise awareness of CAAS' EESG initiatives and impacts</li> <li>Open dialogue and feedback</li> </ul>	Regularly
Aviation Ecosystem & Value Chain (Airlines, Air Cargo Companies, Airport Operator, Ground Handlers, Regional ANS Providers, International Community, Industry Unions etc.)	<ul> <li>CAAS Media Releases</li> <li>CAAS Social Media Platforms</li> <li>CAAS Circulars and Notices</li> <li>Annual Reports</li> <li>Conferences and Exhibitions (e.g. Singapore Airshow, CAAS Safety Seminars)</li> <li>OneAviation Careers &amp; Education Fair 2025</li> <li>Industry meetings (e.g. Future of Aviation Roundtable, Singapore Aviation Sector Tripartite Committee Meetings etc.)</li> <li>Union Dialogues</li> <li>Working with partners to develop online learning content on Aviation Sustainability</li> </ul>	<ul> <li>Proper operations of aviation infrastructure and assets</li> <li>Raise awareness of aviation careers and sustainability</li> </ul>	Regularly
Ministries and Other Government Agencies	■ Inter-Agency and Workgroup Meetings	<ul> <li>Alignment of policies and initiatives across Whole- of-Government (WOG)</li> </ul>	As and when required

#### MATERIALITY ASSESSMENT APPROACH

In identifying the preliminary sustainability material topics, CAAS has benchmarked against industry peers and reviewed global sustainability trends. These topics were then prioritised through stakeholder surveys—targeting both internal and external stakeholders—and through interviews with members of the CAAS Directorate and key Board representatives. This process ensured that CAAS' sustainability focus areas are aligned with stakeholder expectations and sectoral relevance.

The assessment results identified seven core material topics and four additional topics, which were subsequently reviewed and approved by the CAAS Management Committee. These topics are aligned with the United Nations Sustainable Development Goals (UN SDGs), reflecting our commitment to global sustainability priorities.

The materiality approach follows three key steps:



#### Identification

Preliminary sustainability matters are identified based on desktop research

#### **Assessment and Ranking**

Through surveys and interview sessions, internal stakeholders are engaged to assess and rank the importance and impact of each topic identified on CAAS' business and operations

#### **Prioritisation and Validation**

Topics are prioritised and mapped onto a matrix based on the importance and impact of the topic with final materiality results approved by CAAS Senior Management



#### MEMBERSHIP ASSOCIATIONS

CAAS actively engages in global and regional aviation forums to advance collaboration, safety, and sustainability. CAAS currently serve on 17 ICAO panels and close to 100 expert bodies, holding 21 leadership positions. In 2023, Singapore hosted ICAO's Air Navigation World, and CAAS signed an MOU with ICAO to codevelop key training programmes, including the Singapore–ICAO Next Generation Aviation Professionals Scholarship and the ICAO-SAA Directors-General Programme on Aviation Safety.

As chair of the ASEAN Air Transport Working Group (2022–2023), CAAS introduced Sustainability Forums and led the development of the ASEAN Sustainable Aviation Action Plan and its 2023–2024 Work Plan. It also facilitated regional collaboration with partners such as China, the EU, US, Japan, and South Korea.

Regionally, CAAS hosted the 11th Air Traffic Management Sub-Group Meeting and initiated the first Asia-Pacific ANSP Committee, comprising 43 service providers focused on capacity building, seamless navigation, sustainability, and contingency planning.



#### **DEFINITION AND METHODOLOGY**

#### **Environmental**

- **Greenhouse Gas (GHG) Emissions:** GHG emissions refer to gases that contribute to the greenhouse effect by absorbing infrared radiation. CAAS adopts the use of the GHG Protocol Corporate Accounting and Reporting Standard and accounts for direct (Scope 1) and indirect (Scope 2) GHG emissions using the operational control approach. Global Warming Potential (GWP) values are sourced from the 2014 IPCC Fifth Assessment Report (AR5). GHG included in the calculations are CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O.
  - Direct (Scope 1) GHG emissions: GHG emissions from combustion of fuel used for vehicles and equipment owned by CAAS or under CAAS' operational control.
  - Indirect (Scope 2) GHG emissions: GHG emissions that result from the generation of purchased electricity used by CAAS. A location-based method is adopted to reflect the average emissions intensity of the national grid on which energy consumption occurs. For consistency, the grid emission factor (GEF) used for the reporting year is sourced from the latest published factor at the time of publication, from the Singapore Energy Statistics (SES), the Energy Market Authority's (EMA) annual publication on energy statistics in Singapore: The GEF utilised for FY22/23 was 0.417 kgCO₂/kWh. For FY23/24 and FY24/25, the GEF utilised was 0.412 kgCO₂/kWh based on the latest available data from EMA.
- **Energy:** Energy consumption is derived from grid. Energy Utilisation Index (EUI) metrics relate only to electricity use and calculated using the following formula:

Total electricity used in Year X
Total gross floor area in Year X

■ Water: Water Efficiency Index (WEI) is calculated using the following formula:

Total water used in Year X

No.of operational days in Year X × (Avg.no.of employees per day+0.25

(Avg.no.of visitors per day)) in Year X

■ Waste: Waste Disposal Index (WDI) is calculated using the following formula:

Total waste disposed in Year X

No.of operational days in Year X × (Avg.no.of employees per day+

0.25 (Avg.no.of visitors per day)) in Year X

#### Social

- Employees are defined as individuals who are in an employment relationship with CAAS.
- The total number of employees and workers are compiled as of the end of the reporting period (i.e., 31 March 2025).
- High-consequence work-related injury definition: Work-related injury that results in a fatality or in an injury from which the worker cannot, does not, or is not expected to recover fully to pre-injury health status within six months.
- Work-related injury defined as injury or medical condition arising from exposure to hazards in the course of work (excluding domestic work).

#### CAAS SUSTAINABILITY DATA

The sustainability data presented in the table below covers CAAS and its operational assets located in Singapore<sup>1</sup>. This includes corporate offices, air navigation infrastructure such as the Singapore Air Traffic Control Centre and Changi Control Tower, the Seletar Passenger Terminal Building, the Singapore Aviation Academy, and CAAS-owned vehicles.

		Green House Gases Emission and Energy Data					Water Data	
	Electricity ('000 kWh)	EUI²	Scope 1 Emission <sup>3</sup> (tCO <sub>2</sub> e)	Scope 2 Emission <sup>4</sup> (tCO <sub>2</sub> e)	Total Emission (tCO <sub>2</sub> e)	Water ('000 m³)	WEI⁵	
Baseline (FY18/19 to FY20/21) <sup>7</sup>	17,380	247.5	56	7,074	7,130	138	289.2	
FY22/23	18,919	262.1	87	7,889	7,976	123	196.9	
FY23/24	18,933	252.6	33	7,800	7,833	213	322.3	
FY24/25	18,317	244.4	70	7,547	7,617	178	259.7	

	Waste Data			
	Waste (Kg)	WDI <sup>6</sup>		
Baseline (FY22/23) <sup>8</sup>	75,340	0.12		
FY23/24	73,870	0.11		
FY24/25	71,582	0.10		

- Aligning to the GreenGov.SG scope, the assets exclude the overseas office of the Permanent Mission of Singapore to the International Centre for Aviation Innovation), Changi Airport Group premises and Seletar Tower.
- Energy Utilisation Index (EUI) is defined as the total electricity consumed in one year divided by its total gross floor area.
- Scope 1 emission refers to direct emissions from sources that are owned by CAAS.
- Scope 2 emission refers to indirect emissions that result from the use of purchased electricity.
- Water Efficiency Index (WEI) is defined as the water consumption per day divided by the total number of public officer headcount including visitors to the premises.
- Waste Disposal Index (WDI) is defined as the total waste disposed of per day divided by the total number of public officer headcount including visitors to the premises.
- The baseline for electricity and water use is the average of FY18 to FY20, to better reflect hybrid working arrangements post-pandemic.
- The baseline for waste disposed is FY22 as this is when requirements for public waste collector to weigh waste at the premises-level started.

## **GRI CONTENT INDEX**

CAAS has reported with reference to GRI Standards for the period 1 April 2024 to 31 March 2025.

#### GRI 1 used | GRI 1: Foundation 2021

GRI 20 Stand		Description	Page References	Remarks		
	GRI-2: General Disclosures (2021)					
1.	The Or	ganisation and Its Reporting Practices				
2-1		Organisational details	3			
2-2		Entities included in the organisation's sustainability reporting	4			
2-3		Reporting period, frequency and contact point	4			
2-4		Restatements of information		No restatements were made		
2-5		External assurance	4			
2.	Activit	ies and Employees				
2-6		Activities, value chain and other business relationships	3			
2-7		Employees	40			
3.	Govern	nance				
2-9		Governance structure and composition	8			
2-10		Nomination and selection of the highest governance body	8			
2-11		Chair of the highest governance body	8			
2-12		Role of the highest governance body in overseeing the management of impacts	8			
2-13		Delegation of responsibility for managing impacts	8			
2-14		Role of the highest governance body in sustainability reporting	8			
2-15		Conflicts of interest		This includes sensitive information are not to be disclosed due to confidentiality reasons.		
2-16		Communication of critical concerns		This includes sensitive information are not to be disclosed due to confidentiality reasons.		
2-19		Remuneration policies		This includes sensitive information are not to be		
2-20		Process to determine remuneration		disclosed due to confidentiality reasons.		
2-21		Annual total compensation ratio				



## **GRI CONTENT INDEX**

GRI 2021 Standards	Description	Page References	Remarks		
4. Strate	egy, Policies and Practices				
2-22	Statement on sustainable development strategy	5			
2-23	Policy commitments	47			
2-24	Embedding policy commitments	47			
2-25	Processes to remediate negative impacts	47			
2-26	Mechanisms for seeking advice and raising concerns	47			
2-27	Compliance with laws and regulations	47			
2-28	Membership associations	51			
5. Stake	5. Stakeholder Engagement				
2-29	Approach to stakeholder engagement	49			
2-30	Collective bargaining agreements		This includes sensitive information are not to be disclosed due to confidentiality reasons.		

GRI 3 (2021): Material Topics			
3-1	Process to determine material topics	50	
3-2	List of material topics	9	

Material Topic: Climate Resilience and Energy Management				
3-3	Management approach	12		
302-1	Energy consumption within the organisation	18		
305-1	Direct (Scope 1) GHG emissions	17		
305-2	Energy indirect (Scope 2) GHG emissions	17		

Material Topic: Aviation Connectivity and Air Traffic				
3-3	Management approach	23 - 27		

Material Topic: Aviation Safety				
3-3	Management approach	29 - 32		

Material Topic: Critical Incident Risk Management				
3-3	Management approach	33 - 34		



## **GRI CONTENT INDEX**

GRI 2021 Standards	Description	Page References	Remarks
	Material Topic: Employee well-be	eing and develop	ment
3-3	Management approach	36 - 46	
401-1	New employee hires and employee turnover	40	The breakdown of employees by age is not disclosed due to confidentiality reasons.
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	41 - 43	
403-1	Occupational health and safety management system	46	
403-2	Hazard identification, risk assessment, and incident investigation	46	
403-3	Occupational health services	46	
403-4	Worker participation, consultation, and communication on occupational health and safety	46	
403-5	Worker training on occupational health and safety	46	
403-6	Promotion of worker health	39 - 46	
403-7	Prevention and mitigation of Occupational health and safety impacts directly linked by business relationships	46	
403-8	Workers covered by an occupational health and safety management system	46	
403-9	Work-related injuries	46	
404-2	Programs for upgrading employee skills and transition assistance programs	44	
404-3	Percentage of employees receiving regular performance and career development reviews	44	

Material Topic: Ethical Business Practices				
3-3	Management approach	47		

Material Topic: Technology and Innovation				
3-3	Management approach	21		

