



Global air travel will grow strongly in the coming years. However, the operating environment is more complex and uncertain, with geopolitical tensions, economic fragmentation, reconfiguration of trade flows and supply chains, technological disruptions and sustainability imperatives.

On 16 July 2025, the Civil Aviation Authority of Singapore (CAAS) convened a high-level Future of Aviation Roundtable to bring together global leaders to engage in strategic dialogue – to make sense of unfolding developments and explore potential responses to navigate the volatility, build resilience and capture new opportunities. The Roundtable was held on the sidelines of the Global Aviation and Maritime Symposium and High-Level Aviation Week in Singapore.

The Roundtable discussed three main themes:

**Immutable Trends, Undertaking No-Regrets Moves**

**Emerging Trends, Identifying Early Signposts**

**Black Swan Events, Building Resilience**

The Roundtable was presented with seven Immutable Trends which will impact the aviation sector.

## IMMUTABLE TRENDS, UNDERTAKING NO-REGRETS MOVES

Immutable Trends are structural shifts that are widely recognised as inevitable and transformative for global aviation. These warrant proactive “no-regrets” moves that can be undertaken regardless of how the future unfolds.

### 7 Immutable Trends

- 1 Centre of gravity shifting towards Asia
- 2 Countries growing air hubs to catalyse economic growth
- 3 Shortage of skilled talent
- 4 Greater consciousness about the environmental impact of aviation
- 5 Growing market share of Low-Cost Carriers (LCCs)
- 6 Increasing cyber threats to aviation
- 7 Airline profitability set to ease following period of exceptional gains

The Roundtable prioritised and discussed the top three Immutable Trends. A summary of trends that were not discussed at the Roundtable is included in the Annex.

### 1 Centre of gravity shifting towards Asia

Asia's rise as the epicentre of aviation growth is shifting the industry's centre of gravity eastward. Based on revenue passenger kilometres data from IATA, North America accounted for 40% of global traffic in 1990, while the Asia-Pacific accounted for 20%. By 2024, North America's share had declined to 23%, while the Asia-Pacific's surged to 34%, underscoring the latter's growing prominence. This eastward shift is reinforced by Asia-Pacific's demographic weight and rising incomes, which is creating opportunities in sectors like travel, trade and e-commerce. Low-cost carriers have further expanded access to air travel by reaching previously underserved markets, creating a new generation of travellers. International Organisations are also enhancing their regional presence in Asia to better respond to regional needs.

### 2 Countries growing air hubs to catalyse economic growth

Countries are investing heavily in developing air hubs as strategic levers to promote economic growth. Middle Eastern air hubs and airlines continue to expand rapidly through sizeable infrastructure investments and airline fleet growth. In Southeast Asia, Singapore is growing its capacity through the development of Changi Airport Terminal 5, while airports in Bangkok and Kuala Lumpur are enhancing international connectivity and playing increasingly prominent roles in the regional network. The rise of large Tier 2 and 3 cities across Asia is further reshaping regional air traffic flows.

### 3 Shortage of skilled talent

The shortage of skilled aviation talent is particularly acute in mature economies, which face ageing populations and labour shortages. At the same time, the talent mix within aviation is changing rapidly. New roles in data, robotics, artificial intelligence (AI) and systems engineering are growing, underscoring the importance of nurturing professionals who are digitally proficient and hold specialised skills.

In response to these trends, the Roundtable identified various “no-regrets” moves which can be made in four areas.

## CONNECTIVITY

The Asia-Pacific region is anticipated to contribute over half of global air traffic growth in the coming two decades. However, this growth will not be evenly distributed. Aviation players will need to **disaggregate the demand to determine the markets they wish to compete in** – by geography (e.g. destinations), flight category (e.g. domestic vs international), flight segment (short-, medium- or long-haul), passenger type (e.g. origin-destination vs transfer-transit) and consumer preferences (e.g. price sensitivity). A significant portion of the new demand will be driven by first-time travellers who may prefer shorter trips and are more price-sensitive. Aviation players will need to adopt a **data-driven approach to sharpen their strategies and offer more differentiated products for different travel segments**. Air hubs where aviation players congregate will need to work with industry stakeholders to **anticipate changes in trade, people and cargo flows and invest strategically in route and network development**.

## TALENT

Access to skilled talent is critical for harnessing emerging growth opportunities; a strategic priority is to address the talent shortfall across the entire ecosystem. Aviation players will need to **collaborate with educational and training institutions to develop capabilities in high-demand domains, including in technical areas such as robotics, automation, and AI, as well as in soft skills such as critical thinking, adaptability, and communication**. The latter, which has not been given as much attention, is important, as social and emotional intelligence will be essential in navigating a more complex world, fostering collaboration and driving human-machine interfaces and implementation, and be a competitive differentiator in a new technology-driven world.

## TECHNOLOGY & DIGITALISATION

By harnessing digital technologies and adopting automation, robotics and AI, air hubs can unlock workforce efficiency and operational gains and grow smarter, safer, and more sustainable ecosystems. The integration of real-time data across the ecosystem will further improve operational efficiency and passenger experience. To fully realise these gains, air hubs and aviation players will need to recalibrate their technology roadmaps and **move decisively away from labour-intensive models towards a “digital-first” paradigm** that embeds intelligence, agility and resilience at the core of future operations.

## INFRASTRUCTURE

Many air hubs have invested heavily to expand capacity, with a strong emphasis on passenger-facing infrastructure. Air hubs will need to **make corresponding investments in airside capabilities to unlock system-wide efficiencies, including the optimisation of airside operations and the seamless handling of belly-hold cargo**. Air hubs will also need to **incorporate multimodal connectivity and digital infrastructure into airport design to strengthen operational resilience and adaptability**. In addition, air hubs will need to **align infrastructure planning with broader national strategies to maximise synergies with key economic sectors such as tourism, advanced manufacturing, and logistics**.



Artist impression of Changi Airport Terminal 5. Photo credit: Changi Airport Group

The Roundtable reviewed seven Emerging Trends.

## EMERGING TRENDS, IDENTIFYING EARLY SIGNPOSTS

Emerging Trends have the potential to grow in salience over time. They call for vigilant monitoring, with signposts identified as early indicators to guide timely and adaptive responses.

### 7 Emerging Trends

- 1 Opportunities and efficiencies brought by advances in automation, robotics and AI
- 2 Geopolitical volatility drives shifts in supply chain and trade flows
- 3 New economic corridors enabled by next generation aviation
- 4 Aircraft shortage constrains near term capacity growth
- 5 Evolving pricing strategies and shifts in capital expenditure and operating structures
- 6 Aging fleets drive near-to-medium term boom for maintenance, repair, and overhaul (MRO)
- 7 Aviation stakeholders collaborate to innovate for enhanced customers' insights and operational performance

The Roundtable prioritised and discussed the top three Emerging Trends. A summary of trends that were not discussed at the Roundtable is included in the Annex.

### 1 Opportunities and efficiencies brought by advances in automation, robotics and AI

System-wide automation, robotics and AI hold transformative potential for aviation. Data lies at the heart of this transformation. Robust data collection and integration can bring clarity for better decision-making particularly in an increasingly volatile external environment. Success in deployment of these technologies hinges on effective change management. Roundtable participants observed that while some industry players had started off pursuing new technologies independently, many have come to realise that collaboration rather than competition often delivers better results. A shared vision or common goal with clear benefits to each stakeholder will help catalyse collaboration. In this regard, air hubs with more compact ecosystems and interlinked processes will be better positioned to foster collective innovation.

#### POTENTIAL SIGNPOSTS

- Large-scale implementation of AI technology across organisations' core operational domains
- Adoption of AI in strategic decision making
- Greater prevalence of collaboration across companies on joint use cases

### 2 Geopolitical volatility drives shifts in supply chain and trade flows

Rising geopolitical volatility is reshaping global trade patterns. The interplay between market openness and geopolitical risk is giving rise to a multipolar world where distinct economic power centres could emerge. Economies are diversifying their trade partners, with the European Union (EU) negotiating Free Trade Agreements (FTAs) with Southeast Asian economies, and China pivoting towards Asia, Africa and Europe. South Asia-Latin America and China-India trade lanes are also growing. These developments reflect a redistribution of demand. Roundtable participants recognised that new forms of collaboration will be required for the aviation sector to capture the benefits of emerging trade corridors.

#### POTENTIAL SIGNPOSTS

- Increased momentum for new FTAs
- Growth in intra-Asia, South Asia-Latin America and China-India trade volumes
- New cargo routes emerge alongside supply chain regionalisation

### 3 New economic corridors enabled by next generation aviation

Next-generation aviation technologies such as electric vertical take-off and landing (eVTOL) aircraft have the potential to unlock new economic corridors and transform connectivity. While some eVTOL aircraft companies have exited the market, those that remain have become bigger and stronger, mirroring the dot.com era where the handful of survivors went on to reshape the world. Once introduced at scale, eVTOL aircraft could support new or underserved routes for passenger and cargo transport, catalysing new patterns of trade and connectivity. To enable the development of the eVTOL aircraft market, clear regulatory frameworks will be needed to support low-altitude operations.

#### POTENTIAL SIGNPOSTS

- Introduction of regulatory frameworks for low-altitude economy, e.g. regulations supporting the certification of eVTOL aircraft
- Industry consolidation and ecosystem convergence

### BLACK SWAN EVENTS, BUILDING RESILIENCE

Black Swan Events are rare but high-impact disruptions that can significantly alter the trajectory of global aviation if they materialise.

The Roundtable identified four such events and discussed the need to build resilient systems. Given the scale and number of players affected, International Organisations play a critical role in leading a coordinated response to restore normalcy.

#### 1 Crippling cyber attack

As systems become increasingly connected, cyber security has become a real and present concern, with potential to disrupt aviation operations on a global scale.

#### 2 Extreme weather events

Climate change is exacerbating weather events. Hail, floods and turbulence pose risks to flights and airports. Increasing frequency and/or a transformative change in weather patterns could set a new normal which redefines aviation and the travel experience.

#### 3 Large-scale power outage

Over the past year, unprecedented power outage in some countries resulted in significant disruptions to flights and airport operations, not just in those countries but around the world, because of the interconnectedness of air travel. This highlights the need for robust contingency planning, not just at the country level but at the global level.

#### 4 Global pandemic

More frequent pandemics and unpredictable government responses such as sudden travel bans or lockdowns can rapidly disrupt air travel. A mechanism for how to respond to future pandemics can help prevent a repeat of what happened during the COVID-19 pandemic which disrupted air travel on a global scale.

## CONCLUSION

There was broad consensus amongst the Future of Aviation Roundtable participants that global aviation is entering an era of heightened uncertainty and complexity but amidst the challenges lie tremendous opportunities for those who can make sense of the evolving environment, adapt quickly, and act decisively in partnership with others.

Notwithstanding the complexity and uncertainty, air hubs can pursue various “no-regrets” moves – strategic investments and policies that strengthen their fundamentals regardless of how the future unfolds. They will be better positioned to seize opportunities as they arise and to ride out disruptions. At the same time, air hubs can put in place mechanisms to anticipate signposts and build in the agility to recalibrate swiftly as new dynamics emerge. Air hubs can also proactively embed resilience in their institutional DNA, to ensure that whatever strategies, plans and systems they put in place can withstand and recover from Black Swan disruptions.

Above all, the Roundtable reinforced the need for global cooperation. Aviation is intrinsically interconnected. Navigating the future requires more than just innovation and investment. It demands sustained dialogue, shared standards and a renewed commitment to collective stewardship. In a world of flux, collaboration across national and institutional boundaries is essential in ensuring a resilient and future-ready global aviation ecosystem.



*[Seated at table from left to right] Mr Kaushik Das, Senior Partner, Southeast Asia, Singapore, McKinsey & Company; Mr Goh Choon Phong, Chief Executive Officer, Singapore Airlines; Mr Kerry Mok, President & Chief Executive Officer, SATS Ltd; Mr Yee Ping Yi, Deputy Secretary, Strategy, Sustainability & Transformation, Singapore Ministry of Transport; Mr Patrick Ky, Chief Executive Officer, International Centre for Aviation Innovation; Ms Kawal Preet, Regional President Asia Pacific, FedEx; Mr Simon Hocquard, President & Chief Executive Officer, Civil Air Navigation Services Organisation; Mr Juan Carlos Salazar, Secretary General, International Civil Aviation Organization; Mr Han Kok Juan, Director-General, Civil Aviation Authority of Singapore (Moderator); Mr Willie Walsh, Director General, International Air Transport Association; Mr Christopher Ong, Senior Vice President & Managing Director, DHL Express Singapore; Mr Yam Kum Weng, Chief Executive Officer, Changi Airport Group; Mr David Schulte, Managing Director, Regional Marketing, Boeing Commercial Airplanes, The Boeing Company; Mr Philippe Boucherat, VP and MD of Airbus Engineering Centre China, Airbus; Mr Jeffrey Chua, Senior Partner & Managing Director, Boston Consulting Group; Ms Glory Wee, Senior Director, Aviation Development Group, Civil Aviation Authority of Singapore (Secretariat)*

## Annex: Other trends that were touched on but not discussed in depth

## IMMUTABLE TRENDS, UNDERTAKING NO-REGRETS MOVES

**4 Greater consciousness about the environmental impact of aviation**

Carbon policies and pricing mechanisms across various jurisdictions are reshaping air travel economics. Sustainable Aviation Fuel presents a crucial pathway towards emissions reduction, though take-up by airlines and the willingness of consumers to pay remains uncertain.

**5 Growing market share of LCCs**

As LCCs continue to gain market share, traditional carriers must adapt their operations and service offerings to maintain competitiveness, whilst adjusting their route networks to reflect evolving market demands and passenger preferences. Hybrid business models are increasingly blurring boundaries between full-service carriers and LCCs.

**6 Increasing cyber threats to aviation**

Airport and airline systems are seeking to digitalise operations to reap efficiency gains. But these digital systems and the inter-connectedness of these systems has created potential points of exposure and vulnerability that malicious actors could exploit.

**7 Airline profitability set to ease following period of exceptional gains**

Airline profitability has been rosy in recent years, but this could move towards a period of financial recalibration, with a gradual normalisation of yields as market conditions stabilise and competition intensifies.

## EMERGING TRENDS, IDENTIFYING EARLY SIGNPOSTS

**4 Aircraft shortage constrains near term capacity growth**

The aviation industry is facing a shortage of aircraft and components primarily due to supply chain disruptions. The pace of production recovery remains uncertain. While production may eventually catch up with demand, there is a risk of overcorrection, which could create headwinds across the value chain.

**5 Evolving pricing strategies and shifts in capital expenditure and operating structures**

New economic models may be required to ensure sustainable funding and operational viability across different stakeholders in the industry. Cost and pricing models need to factor in capital-intensive investments required for automation and digitalisation.

**6 Aging fleets drive near-to-medium term boom for MRO**

The extended time-to-retirement for aircraft is driving global MRO market growth, particularly in emerging markets. However, this growth could decelerate as newer aircraft – with reduced maintenance needs and improved MRO turnaround times – enter the fleet.

**7 Aviation stakeholders collaborate to innovate for enhanced customers' insights and operational performance**

Collaboration among aviation stakeholders can drive improvements in operational efficiency and the traveller experience. Through data sharing and joint operations control centres, the ecosystem can deliver seamless end-to-end journeys, real-time updates, personalised services, and optimised processes.