



NEXT GENERATION OF AVIATION IN INDIA

Opportunity Whitepaper

How Swedish companies can support in the growth of aviation in India?



FOREWORD

The India aviation market– a High Potential Opportunity

India's aviation sector has seen a growth of over 14 percent¹ in passenger traffic in the last six years. The country is expected to become the world's third largest aviation market by this decade, mainly driven by a large and growing middle class and a strong push to leverage the sector for economic growth. The Government is committed to building a new aviation infrastructure with 21 new greenfield airports being accorded in-principal approval in 2021. USD 20 billion² worth of aviation infrastructure is currently under various stages of development in India.

A growing aviation market in India has the potential to enhance connectivity, improve employment, encourage tourism, make India a hub of aviation facility and complement other modes of transportation.

Business Sweden has identified the following areas in aviation for potential collaboration between India and Sweden:

1. Energy efficient airport infrastructure
2. Optimisation of airspace
3. Efficient air traffic management
4. Digitalised airport and aviation
5. Sustainable airport operations
6. Aero-city developments
7. Technology transfer and training

This whitepaper provides a sector overview and highlights key developments of the aviation industry in 2021. The intent is to map India's requirements and evaluate business opportunities wherein Swedish companies can collaborate with Indian counterparts and support the sector. This whitepaper also presents actions to be carried out by Business Sweden.



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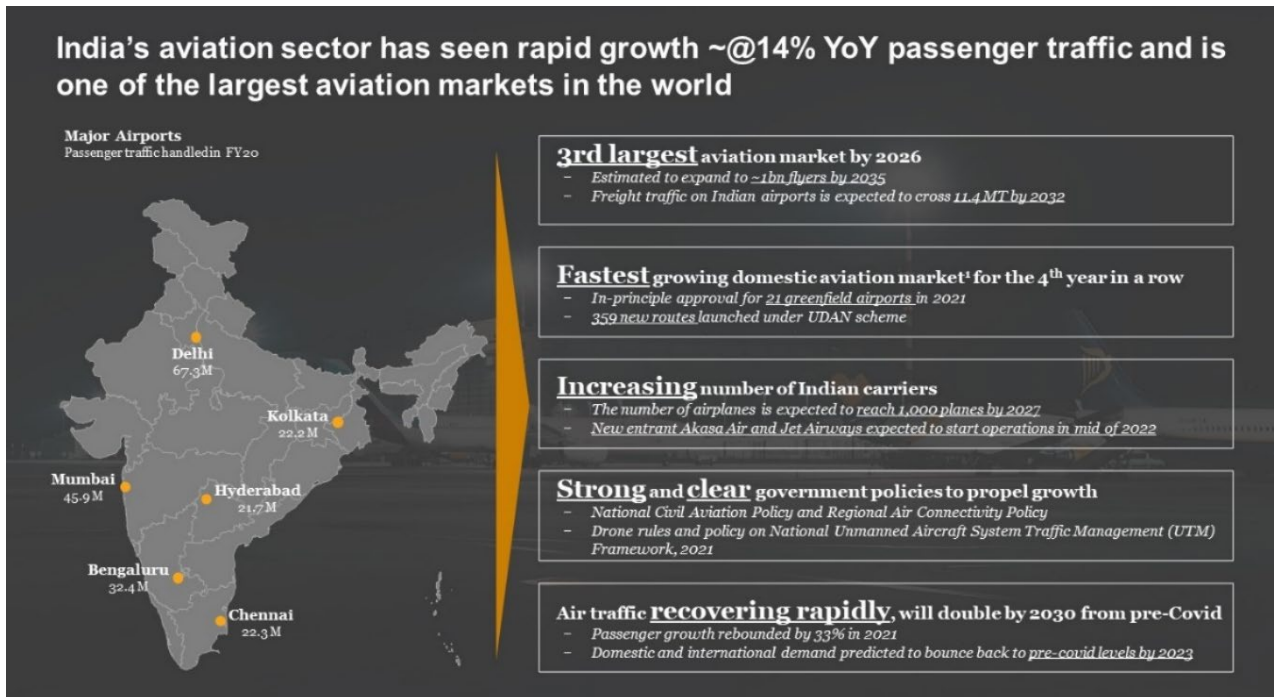
¹ Economic Survey 2021-22

² Accessed from India Investment Grid

It is our aim, that our conclusions will not only be a call to action for Swedish companies but will strengthen the continued dialogue through fruitful discussions between India and Sweden on the development of aviation industry.

OVERVIEW

Indian aviation market



The Indian aviation market is one of the fastest growing in the world and considered the 5th largest³ in terms of passenger (domestic and international). A growing passenger and freight traffic along with the Government of India's investment to develop aviation infrastructure, will set India to become the 3rd largest aviation market in the world by this decade. As per IATA's estimate, India passenger traffic is expected to reach 1 billion⁴ by 2035.

Under the Government's UDAN (Regional connectivity) scheme for increasing connectivity, it has operationalised 359 routes and 68 airports including five heliports and two water Aerodromes. While six airports already have been privatised, several are in the pipeline to be privatised. The Government in December 2021 told the Parliament that in principle approval has been accorded for setting up 21 greenfield airports across the country. In the recently tabled Economic Survey of 2021-22, the number of operationalised airports

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Given the fleet projection, India may require around 9 000 pilots over the next five years implying the requirement of almost 1 800 pilots per year.

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– Minister of Civil Aviation, Govt. of India, December'21

³ Invest India accessed at <https://www.investindia.gov.in/sector/aviation>

⁴ IATA estimate

(up to December 2021) stands at 130, up from 62 in November 2016.

Since India is a country with a large, varied geography and has a substantial middle income and rural population, movement of people and goods is essential to achieve economic growth. Transportation via aviation have the potential to drive economic growth beyond the metropolitan areas, creating more opportunities for investments, encourage tourism through regional connectivity and generate employment.

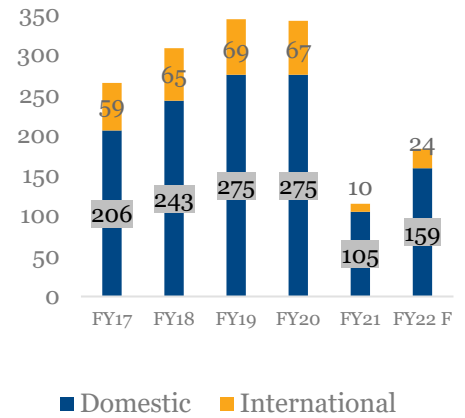
The increase must be supplemented by an increase in aircrafts, MRO services and flight training institutes etc. The aircrafts are projected to reach 1 000 in the next five years from current 710⁵.

In the Union Budget 2022, the Government has allocated INR 10,667 crore (SEK 13 Bn) to the aviation sector, of which INR 601 crore (SEK 724 Mn) has been allocated to the UDAN scheme.

The domestic aviation industry faced several headwinds due to the COVID-19 pandemic over the last two years with travel restrictions imposed by the Government, ban on international flights and cap on ticket pricing added to the woes of the industry. The demand crashed in 2020-21 but has gradually recovered in 2021-22. Total passenger traffic (domestic and international) in India during FY19⁶ and FY20 was around 344⁷ million, which reduced to 115 million in FY21 due to COVID. The same has rebounded and is expected to be around 183 million by March 2022. The passenger load factor also rebounded from ~50 percent in June-July 2020, 65-70 percent in November-December 2020 to ~ 80 percent in December 2021 for all major airlines in India. Air-cargo demand has already surpassed⁸ the average tonnage carried during pre-COVID in October 2021. With further easing of travel restrictions and an uptick in economy activity, the sector is expected to rebound further to pre-COVID levels in 2022.

The outlook for the aviation sector in India remains positive with new airline entrants, incoming plane deliveries and

India Passenger traffic in Mn



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Passenger load factor rebounded to ~80% in Dec'21 from around ~50% in Jun-July'20

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⁵ Press release by Ministry of Civil Aviation, Government of India, December 2021 accessed at <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1778986>

⁶ Financial year is from April to March

⁷ Traffic data from Airports Authority of India website

⁸ Economic Survey of India 2021-22

demand once again picking up. One can expect the aviation sector to gain momentum in 2022.

KEY RECENT DEVELOPMENTS

in the aviation sector in India

Policy and regulations

- Government of India notified the Drone Rules, August 2021
- Policy on National Unmanned Aircraft System Traffic Management (UTM) Framework, October 2021
- Production Linked Incentive (PLI) scheme for drones and drone components in India, September 2021

The Government of India is committed to developing the aviation sector and has notified these policies and regulations to enable usage, tap potential and to develop the ecosystem required. Recently drones were pilot tested to spray nano urea in Gujarat and to lift Lakadong turmeric from inaccessible areas of Meghalaya⁹.

Airports

- Construction of a greenfield airport at Jewar, around 50 miles of New Delhi started in November 2021. It will be expanded in phases with Phase I target of 12 Mn passengers and to be expanded to handle traffic for the next 30 years.
- Navi Mumbai International airport is under construction and is designed to handle 10 million passengers per year in the first phase (2024) and will be expanded to handle 90 million passengers.
- More than 50 percent work completed in Mopa greenfield airport in Goa. It is expected to be completed in August'21.

Second airports are being developed in Delhi and Mumbai and in-principal approval accorded to 21 new greenfield

⁹ News reports

airports across India to cater to expanding passenger demand over the next 30 years. USD 20 Bn worth of investment opportunities in aviation.

Airlines

- Tata Sons officially took over Air India in January 2022
- New entrant Akasa Air likely to get operational by mid-2022
- Jet Airways expected to re-start operations by mid-2022

An increasing interest of private organisations to take over an old airline or launch new airlines is a testament to the growth story of Indian aviation.

Maintenance, Repair and Overhaul (MRO)

- Goods and Services Tax (GST) rates reduced to 5 percent from 18 percent for domestic MRO services, August 2021
- Government is working on a new policy for MRO
- Safran is considering setup of an engine-repair facility in India

Government of India has envisaged to make India a global MRO hub, handling nearly 90% of the MRO needs of Indian operators and obtaining around 20% of the MRO revenue from foreign-registered aircraft. MRO industry is expected to grow from USD 800 million¹⁰ to USD 2.4 billion by 2028.

SWEDEN'S CONTRIBUTION

To the global aviation market

According to IATA¹¹, in Sweden, the air transport sector has a contribution to Sweden's economy, impacting around

¹⁰ IBEF estimate

¹¹ Sweden Air Transport Regulatory Competitiveness Indicators

192,000 jobs and contributing to about 3.8 percent of the Swedish GDP.

In addition, the aviation or the air transport sector has contributed greatly to Sweden's economic and social development through its policies on regional connectivity, in developing aviation infrastructure for emergency, efforts to reduce greenhouse gas emissions and in promoting sustainability.

Sustainable growth

Sweden is committed to sustainable aviation. Swedavia in 2020 has achieved the target of no fossil carbon dioxide emissions from Swedavia's airport operations. Some of the other targets¹² are:

- Share of sustainable aviation fuel to be 5 percent by 2025
- Swedish domestic air transport to be 100 percent fossil free by 2030
- 100 percent of Swedish Air transport, domestic and internal to be fossil free by 2045

Sweden is on course to achieve the targets set towards making the sector more sustainable through efficient solutions across the whole airport sector: focusing on airspace design, ground operations, staff trainings, energy, water, waste, fuel management, lighting and public transport.

Economic and social development

The aviation sector contributed through connecting Sweden to the global market, inward investments, rapid transport of high value goods, labour mobility and technology transfer.

In terms of social development, the sector and its regional connectivity provided access and enabled social inclusion of remote communities, cultural enrichment, tourism, and knowledge transfer.

In a paper titled '*Resilience endangered: The role of Regional Airports in remote areas in Sweden*, published in November 2021¹³, one of the conclusions was the following:

"The results showed that regional airports are important not only for business, charter or regular travel but for a variety of activities and stakeholders in society. In addition

¹² Website of Swedavia

¹³ Accessed at <https://www.mdpi.com/1377566>

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In 2020, no fossil carbon dioxide emissions from Swedavia's airport operations.

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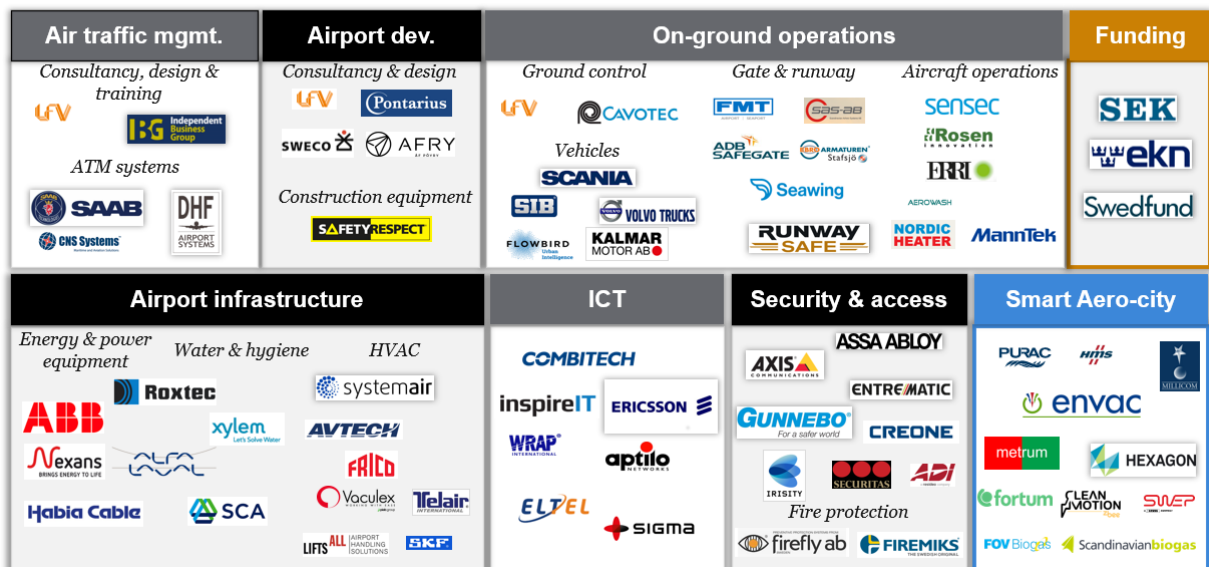
– *Swedavia Airports*

to crisis management and operation, resilient aviation infrastructure is essential for public service, private business and industries as well as for national security and civil protection, which necessitates cooperation among many societal actors.”

NEXT GENERATION AVIATION

How can India leverage Sweden’s strengths in aviation?

Swedish expertise extends across the Air Traffic Management and airport value chain – including Swedish governmental finance solutions



Driven by smart and digital technologies, ranging from high-tech air traffic management systems to new airport terminal designs, airports across the world are moving towards building futuristic airports, which provide a world class unique flyer experience to each passenger. However, some inherent challenges remain, pertaining to capacity, sustainability, and security.

Simultaneously, there is a constant quest to optimise the whole aviation ecosystem from a sustainable point of view and minimise the environmental footprint as the global threat of climate change becomes more and more clear. In addition, digital and geopolitical developments have resulted in an increasing demand on security of airline infrastructure.

The aviation sector in India is undergoing a transformation, with the current focus being on infrastructure development and improving connectivity. However, the sector is facing challenges in terms of better utilisation of resources, reducing congestion, finding sustainable solutions for its airports, improving airspace efficiency and air traffic management, ensuring a seamless digital shift, and use of the next generation technology in all areas of aviation.

Therefore, the sector needs smart, sustainable, and efficient solutions, which can be brought through collaboration with countries like Sweden. The future's profitability will depend on what steps the sector takes today considering the challenges at hand.

Business Sweden has identified key areas required for developing the next generation of aviation in India:

1. Energy efficient airport infrastructure
2. Optimised airspace
3. Efficient air traffic management
4. Digitalised airport and aviation
5. Sustainable airport operations
6. Aero-city developmentsⁱ
7. Technology transfer and training

The above are potential areas wherein Sweden and Swedish companies can play a larger role by investing and collaborating with the Government in India and Indian companies present in the Indian aviation sector.

Investment scenario

The current aviation ecosystem presents a large opportunity for investors and aviation players to tap into a growing Indian aviation sector.

The Indian Government wants to focus on the use of technology and digitalisation to enhance passenger satisfaction. It is also looking to increasingly adopt green building infrastructure for the aviation sector, use of onsite and offsite renewable energy, using electric vehicles-based airport operations, installation of charging facilities by airports, availability of biofuels, use of modern aircraft fleets that benefit noise and fuel efficiency.

Through an open and liberal foreign direct investment (FDI) policy, the Indian Government wants to attract more foreign

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100% FDI allowed under automatic route for greenfield and brownfield projects, ground handling services, MRO facilities etc.

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investors. India has a liberal FDI policy with 100 percent FDI allowed under automatic route for both greenfield and brownfield projects. 100 percent FDI under the automatic route is also allowed in the ground handling services, MRO facilities, flying and training institutions. The country has recently notified polices and rules for emerging aviation areas like Drones, Unmanned Vehicles, Air sports etc.

AREAS OF COLLABORATION

Potential areas in which Swedish companies can support India

India can leverage the expertise of the Swedish companies to build the next-generation aviation. Sweden is considered a world leader. Over 80 Swedish companies are active and have expertise across the value chain and experience in implementing their solutions globally.

Sweden currently has several ongoing or completed aviation initiatives within Air Traffic Management and airport development and operation in many countries: Mexico, Ghana, Poland, Turkey, Qatar, the United Arab Emirates, Vietnam, Philippines, and Indonesia.

Today, the Swedish aviation industry has a global reputation for innovation at the highest levels across many aviation sectors offering the national and international marketplace considerable opportunities for collaboration. Recently, Mid Sweden University has been granted SEK 10 million by Vinnova for further research on the airport of the future.

The following section highlights some cases wherein Sweden's companies has supported the aviation industry globally:

Energy efficient airport infrastructure

Sweden is the leader in developing energy efficient airport infrastructure. Swedish companies specialise in providing efficient ventilation solutions, green energy solutions, water and wastewater handling solutions and numerous products which support the overall efficiency of airports.

Case example:

Swedish companies have energy efficient products which are used to develop airport infrastructures. Some of the globally renowned companies are ABB, Habia Cables, Roxtec, Xylem, Systemair, Alfa Laval, Atlas Copco, Gunnebo, Securitas, and Runway Safe.

Optimised Airspace design

Sweden is specialised in creating an optimised structure with an improved standard operating procedure (SOP) for enroute airspace, approach and departure routes, instrument approach and holding areas. The designed airspaces increase efficiency, capacity, guarantee safety, improve on-time performance, increase cost-savings for airlines, as well as decrease the carbon footprint.

Case examples:

LFV Aviation has supported over 50 countries the last 30 years to design efficient and world-leading airspaces. In September 2021, LFV was commissioned by the Government of Sweden to propose how airspace below 2 900 metres should be designed.

Efficient Air Traffic management

Sweden is a leader in providing and implementing systems for digital tower solutions, Collaborative Decision Making (A-CDM), real time data sharing (A-TFM) and improved runway capacity. Such systems improve the on-time performance, provides cost savings for operating remote airports and makes it possible to increase airport capacity without building additional runways.

Case example:

London-Gatwick is considered to have one of the efficient runways in the world with 60 movements per hour – a Swedish team designed its operation using dynamic spacing, new technology and procedures.

In 2015, Sweden was the first country globally to implement remote airport management, at an airport in Ornskoldsvik. Technology from Saab Digital Air Traffic Solutions has enabled London City Airport to become the first major

international airport in the world to be fully controlled by a digital tower for remote air traffic control.

Digitalised airport and aviation

Sweden can provide several interesting digital solutions for contactless passenger journey, fully automated security and baggage handling systems, self-serving machines, access solutions which will be based on smart integrated data management system. In addition, there are AI/ML enabled solutions for remote and predictive monitoring, pattern recognition, pro-active decision etc.

Case example:

Visby airport, situated off Sweden's south-eastern coast, is making travel experience more comfortable and efficient for passengers. The airport introduced an automated self-bag drop system and is offering self-service concepts in a bid to make air travel hassle-free for flyers through lesser congestion queues at the airport.

Ericsson is also another player in digital communication space providing airport communication solutions.

Saab Digital Air Traffic Solutions handles the entire process – from planning to implementation and administration of services in remote-controlled air traffic control.

Sustainable airport operations

Swedish companies are specialised in building green airports using renewable energy sources, effective water management and green building technology. In addition, efficient airspace design and air traffic management have significantly decreased carbon emissions during departure, taxing, and approach.

Case example:

Swedavia AB is a Swedish Government-owned company, that owns and operates ten Swedish airports ranging from Sweden's largest airport (Stockholm) to smaller airports such as Kiruna. Swedavia is a world leader in developing sustainable airports which includes electrification of vehicles and electric roads connecting the city centre and the airport (for example in Visby). The Swedavia airport Arlanda in the capital of Stockholm was the first airport globally to receive

the highest climate ranking by the Airport Carbon Accreditation (ACA) in 2009.

Aero city developments

Sweden has unique knowledge of landside and airside works at airports as well as urban planning of building sustainable, smart, and safe cities. Several Swedish innovations can contribute to efficient and green solutions for water and waste management, power generation and distribution, as well as insulation and HVAC.

Case example:

Hammarby sjöstad is one of the world's most successful urban sustainable districts and is the result of collaboration between municipal authorities, urban planners, developers, architects, landscape architects, engineers at eco-tech businesses, energy company Fortum and the Stockholm Water Company.

The 200 hectares-district has a 30-40 percent lower environmental impact than similar districts. It only uses electricity from renewable sources such as solar panels, purified wastewater is utilised in district heating and cooling, biogas is extracted from sewage sludge and food waste is used as vehicle fuel. Furthermore, combustible waste becomes district heating and electricity, rainwater from streets purified locally to avoid strain on sewage treatment plant and the daily water use is 25 percent lower than average.

Technology transfer and training

India benefits from collaborating with the Government of Sweden in terms of technology transfer. Agencies in Sweden may provide India with training of staff to improve airport efficiency, sustainability, and safety as well as to transfer the technical knowledge of designing airspace, implementing new equipment and new procedures.

Around 200 companies are already present in India, and many have local and global solutions, which can be utilised across the Indian aviation sector.

ROAD AHEAD

There are ample opportunities for Swedish companies to collaborate in India and find ways to unlock efficiencies and create a sustainable aviation industry going forward. This can be done by focusing on key identified areas, in which Sweden has great expertise and where India requires support. Inculcating a culture of innovation is critical to be at the cutting edge of technology.

The initiatives must be driven at the highest level i.e., between the Government of Sweden and India. Business Sweden with its unique mandate is well placed to support these initiatives. Business Sweden's offerings are customized as per requirement and provides end to end support to Swedish companies for the entire project lifecycle

The following activities are planned:

Business-to-Government

- Leverage G2G framework between Sweden and India to accelerate growth in India
- Drive focused dialogues and policy advocacy
- Engage with critical stakeholders and decision makers
- Develop areas of co-operation between Sweden and India in the aviation sector
- Sign an agency-to-agency memorandum of understanding (MoU)

Business-to-Business

- Leverage Business Sweden network with top management of Indian conglomerates
- Qualification and validation of requirements by Indian companies
- Management of stakeholders across the Indian companies leading to deal closures
- Matchmaking and partnership development
- Support Swedish companies in undertaking pilot projects
- Business incubation and operational services

Above are some of the proposed initiatives. Business Sweden will undertake webinars and meetings with clients wherein Swedish and Indian companies can come together for discussions.

Swedish companies are encouraged to contact Business Sweden offices if they want to be a part of the successful growth story in India.

For more details and information, please reach out to us on the addresses below.



We help Swedish companies grow global sales and international companies invest and expand in Sweden.

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