# पोस्ट ऑपरेशन विश्लेषण रिपोर्ट
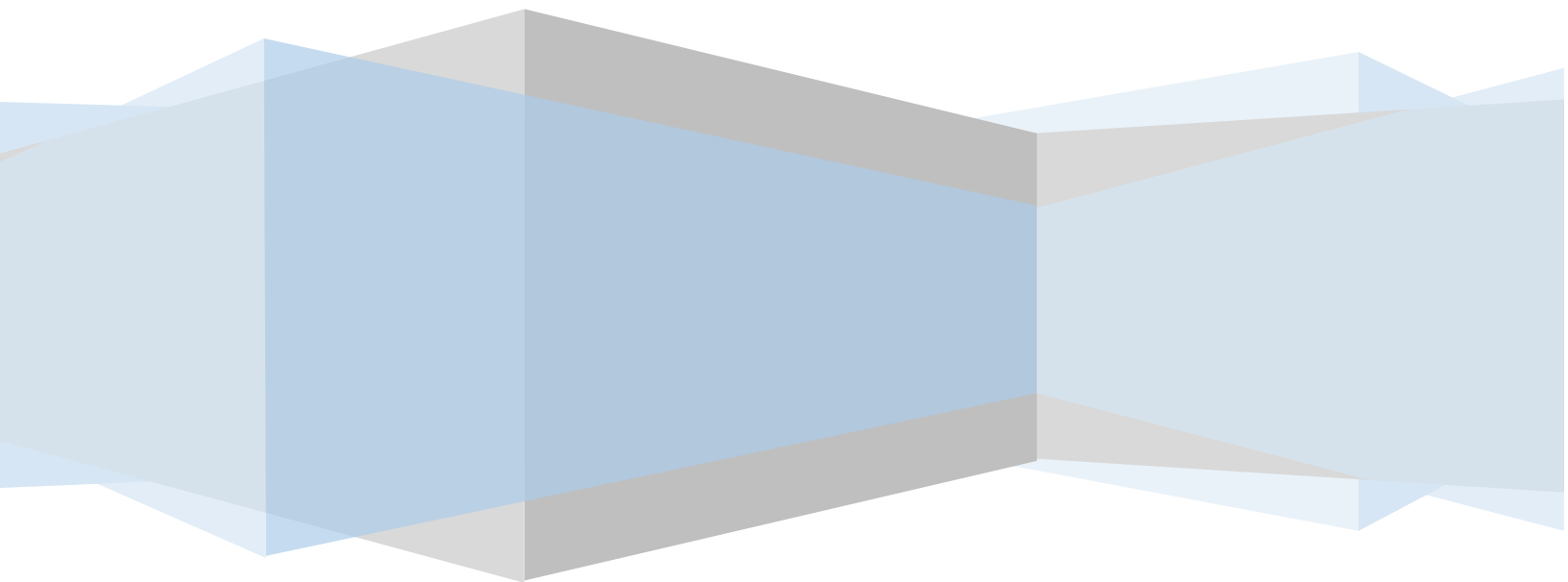
## जून, 2025

### सेंट्रल कमांड सेंटर, सी ए टी एफ एम, दिल्ली

# POST OPERATIONS ANALYSIS REPORT

## June, 2025

### CENTRAL COMMAND CENTER, C-ATFM, DELHI

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# A. कार्यकारी सारांश/Executive Summary

Average Domestic air traffic (30 days) has recorded a decrease of 7.3% whereas the average international air traffic has decreased by 0.19 % in the month of June 2025 as compared to May '25.

On average, the Indian Airports in the ATFCM area saw 5644 IFR flights per day in the month of June 2025. The peak days were on 05th June 2025 (6120 IFR flights). Wednesday's were the busiest days throughout this month with an average of 5796 IFR flights per day.

Total Thirty Four (34) ATFM measures were applied this month during periods of congestion at Bengaluru,Chennai, Delhi and Mumbai Airport.
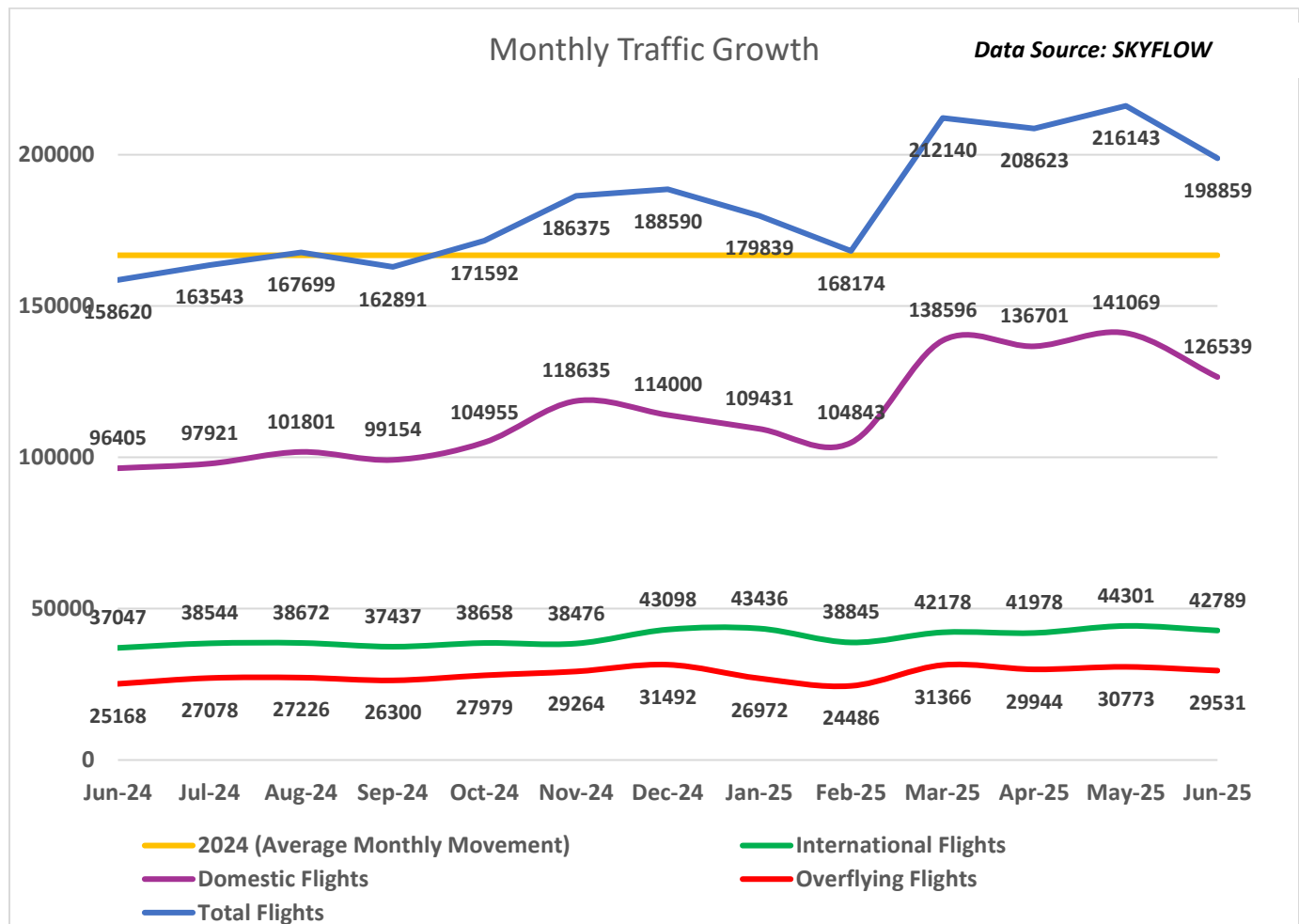


**Figure 1: Monthly Traffic Growth**

The graph above depicts the Domestic, International and Overflying Air traffic in Indian ATFCM Area during the last 13 months (June'24 to June'25).

CCC-CATFM/2025/07/09

# B. यातायात विश्लेषण/Traffic Analysis

I. भारत के प्रमुख हवाई अड्डों पर हवाई यातायात गतिविधि /Air Traffic Movement at Major Airports in India
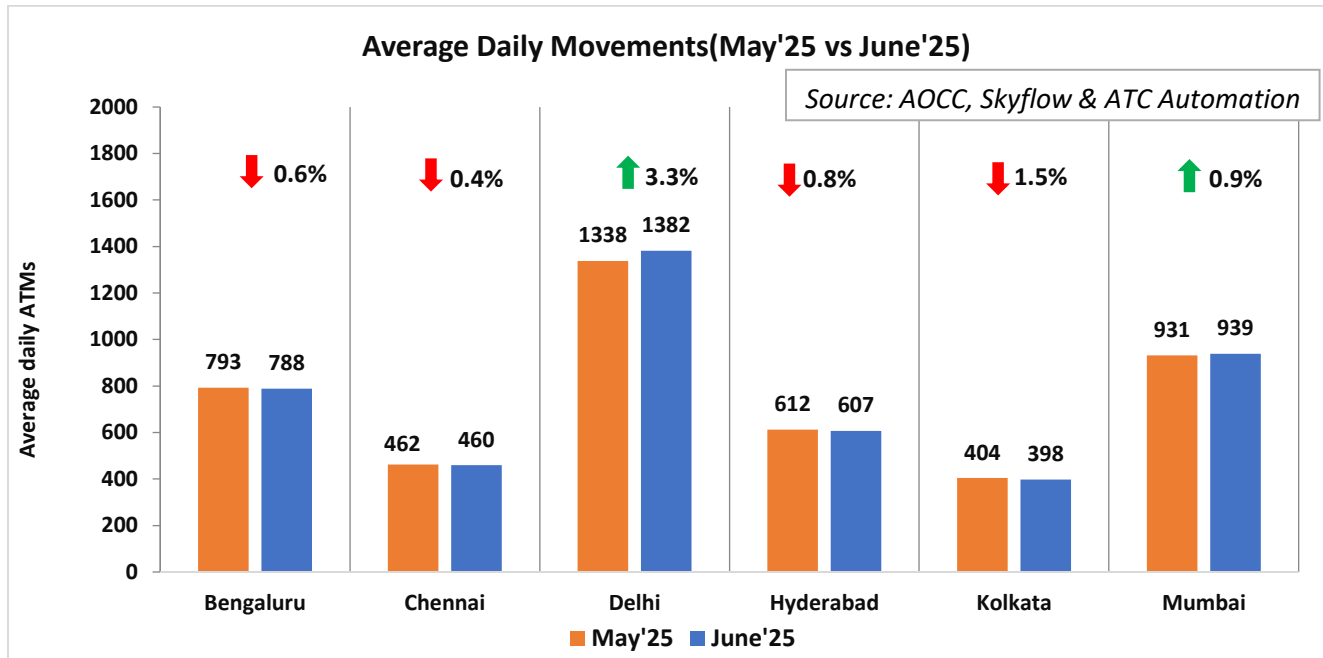


**Figure 2: Average Daily Movements (May'25 vs June'25)**

The above chart depicts the percentage change in average daily ATMs at six major Airports in June 2025 as compared to the previous month June 2025.

| Airports\Year | Avg. Daily ATMs (YoY) for six major airports | | | | |
|---|---|---|---|---|---|
| | June'21 | June'22 | June'23 | June'24 | June'25 |
| Bengaluru | 221 | 571 | 638 | 712 | 788 |
| Chennai | 150 | 369 | 394 | 406 | 460 |
| Delhi | 584 | 1232 | 1219 | 1340 | 1382 |
| Hyderabad | 176 | 441 | 457 | 515 | 607 |
| Kolkata | 151 | 390 | 379 | 401 | 398 |
| Mumbai | 299 | 783 | 872 | 926 | 939 |

Air Traffic Movement for each day in June 2025 is plotted for Delhi, Mumbai, Bengaluru and Hyderabad Airport along with the percentage change w.r.t. Avg. Daily Movements for the same month.
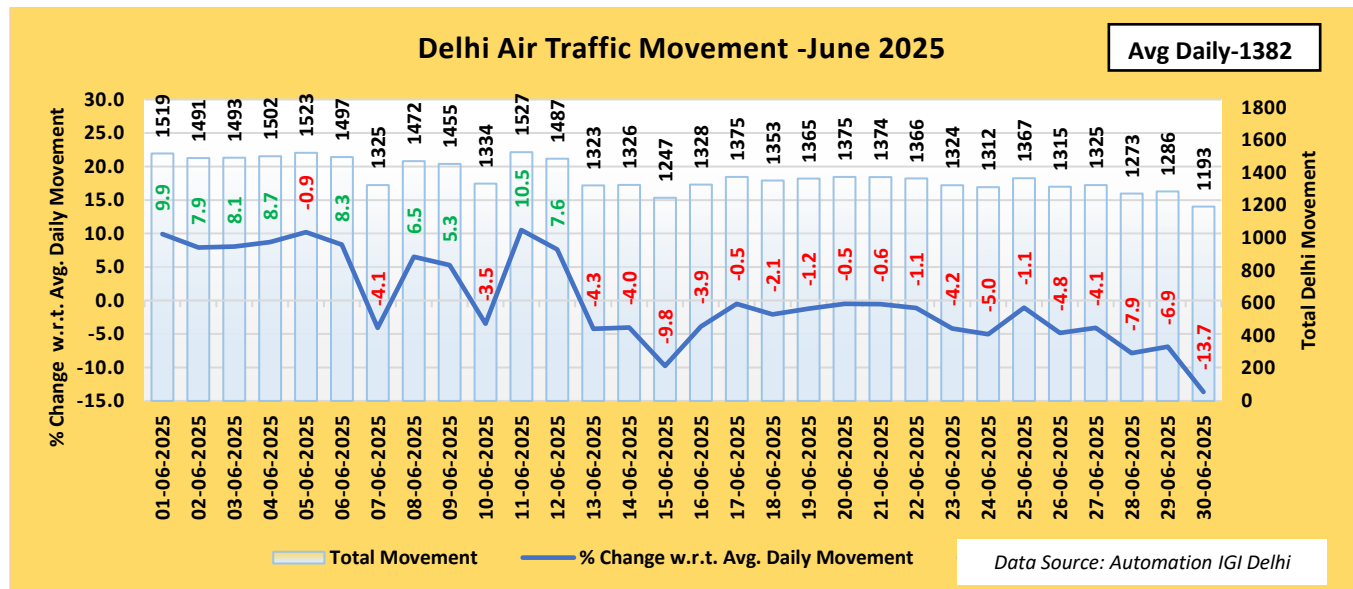


**Figure 3: Air Traffic Movement for Delhi –June'25**
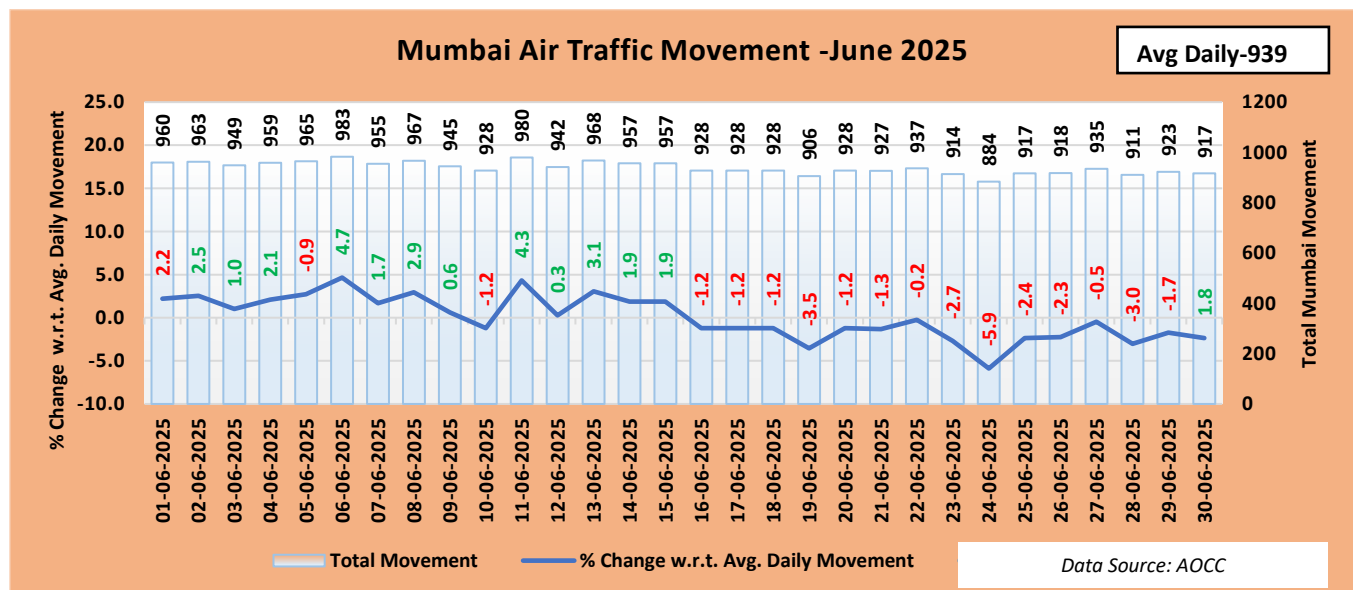


**Figure 4: Air Traffic Movement for Mumbai – June'25**
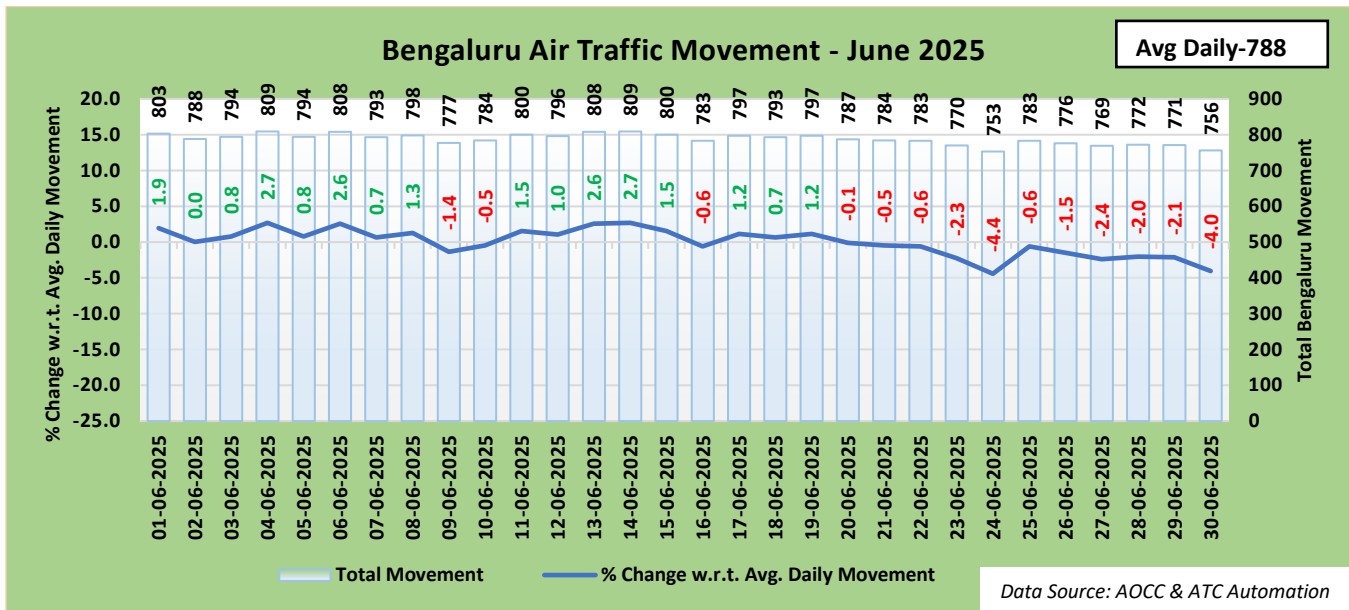
**Figure 5: Air Traffic Movement for Bengaluru – June'25**
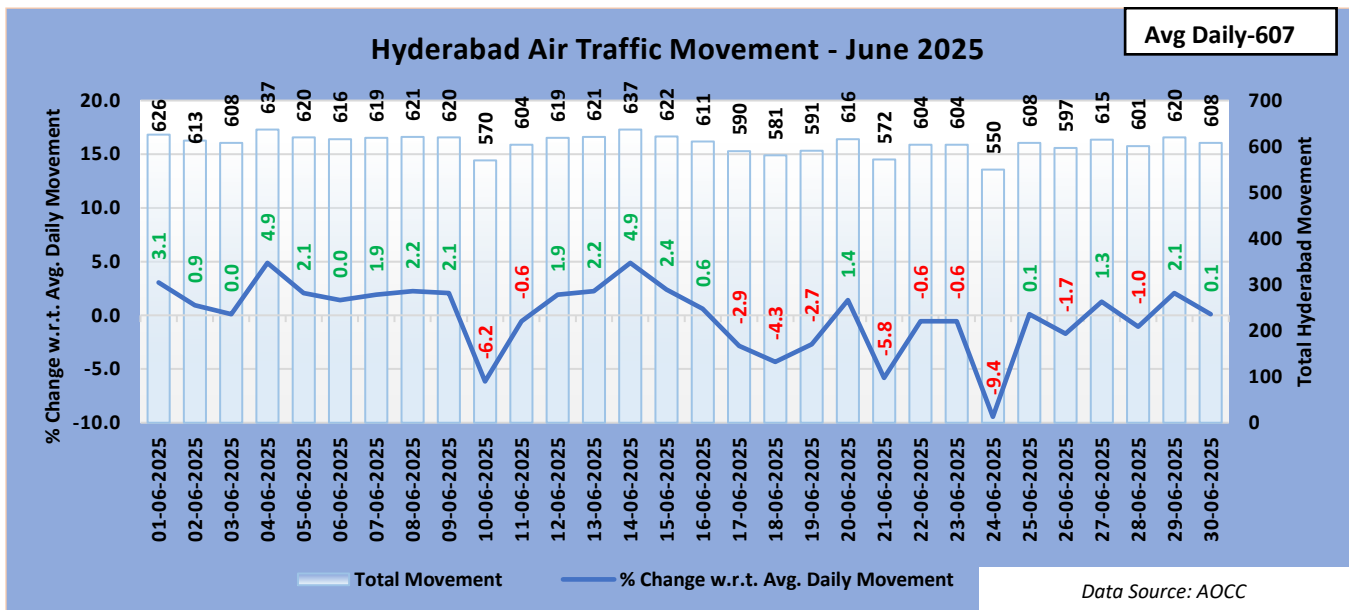


**Figure 6: Air Traffic Movement for Hyderabad – June'25**

It can be concluded from the above charts that the ATM at Delhi, Mumbai, Bengaluru and Hyderabad exceeds the average daily movement for 9 days, 13 days, 16 days and 19 days respectively in the month of June 2025.

## II. एटीएम की वार्षिक व मासिक तुलना/Comparison of total ATMs (YoY) and Monthwise

The total Air traffic movement(ATMs) including Passenger and other flights such as Cargo flights, International scheduled, International non-scheduled, Domestic scheduled, Domestic non-scheduled, Air taxi & commercial business flights at six major Indian Airports namely Delhi, Mumbai, Bengaluru, Hyderabad, Kolkata and Chennai is plotted for the month of June for two consecutive years 2024 and 2025 respectively. Air Traffic movement is also plotted Airline wise for the last six months for the major Scheduled Operators.
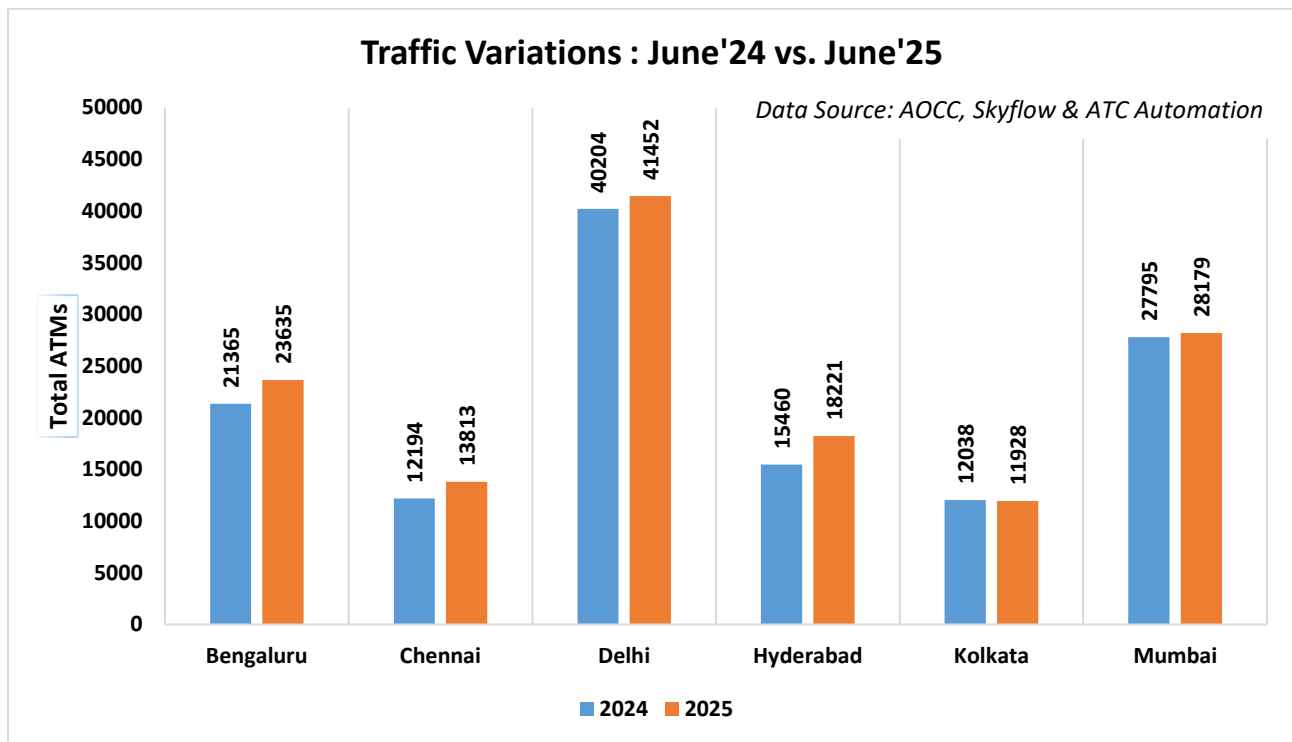


**Figure 7: Traffic Variation (YoY)**

## III.    उड़ान संचालन – एयरलाइन अनुसार/Flight Operations – Airlinewise
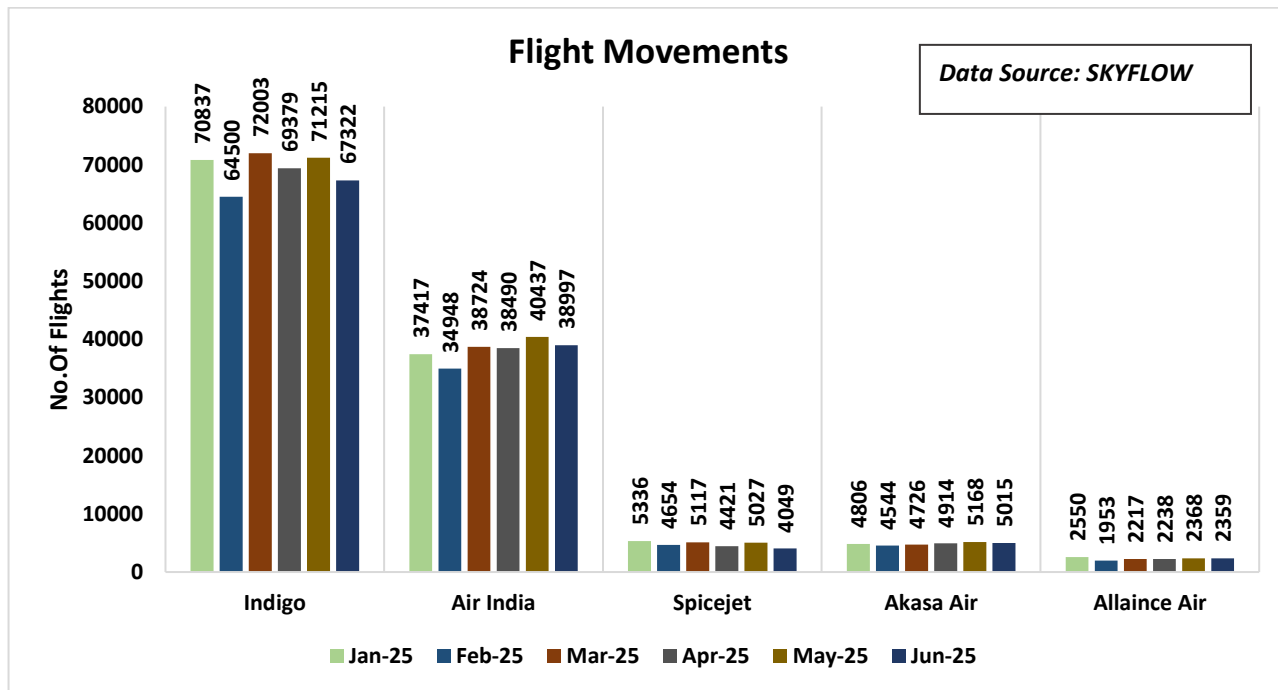


**Figure 8: Flight Movements –Airlinewise**

**Inference:**

1.  Akasa and Alliance Air airlines have recorded an increase in the monthly average( 30 days) Flight movement in June'25  as compared to May'25 while Indigo, Air India, Spicejet airlines have recorded a decline during the same period.

## C. सी.एटीएफएम पोस्ट ऑपरेशन - सीडीएम विश्लेषण
## ATFM Post Operations – CDM Analysis

### I. परिचय/Introduction

**Analysis Period**     **1$^{st}$ – 30$^{th}$  June 25**

**Back Ground**     During the above mentioned period, **One (01)** ATFM measures were applied **for Bengaluru Airport,  Eight (08)** ATFM measures were applied **for Chennai Airport, Twelve (12)** ATFM measures were applied **for Delhi Airport and Thirteen (13)** ATFM measures were applied **for Mumbai Airport** due to the following reasons as illustrated in the bar chart below:–
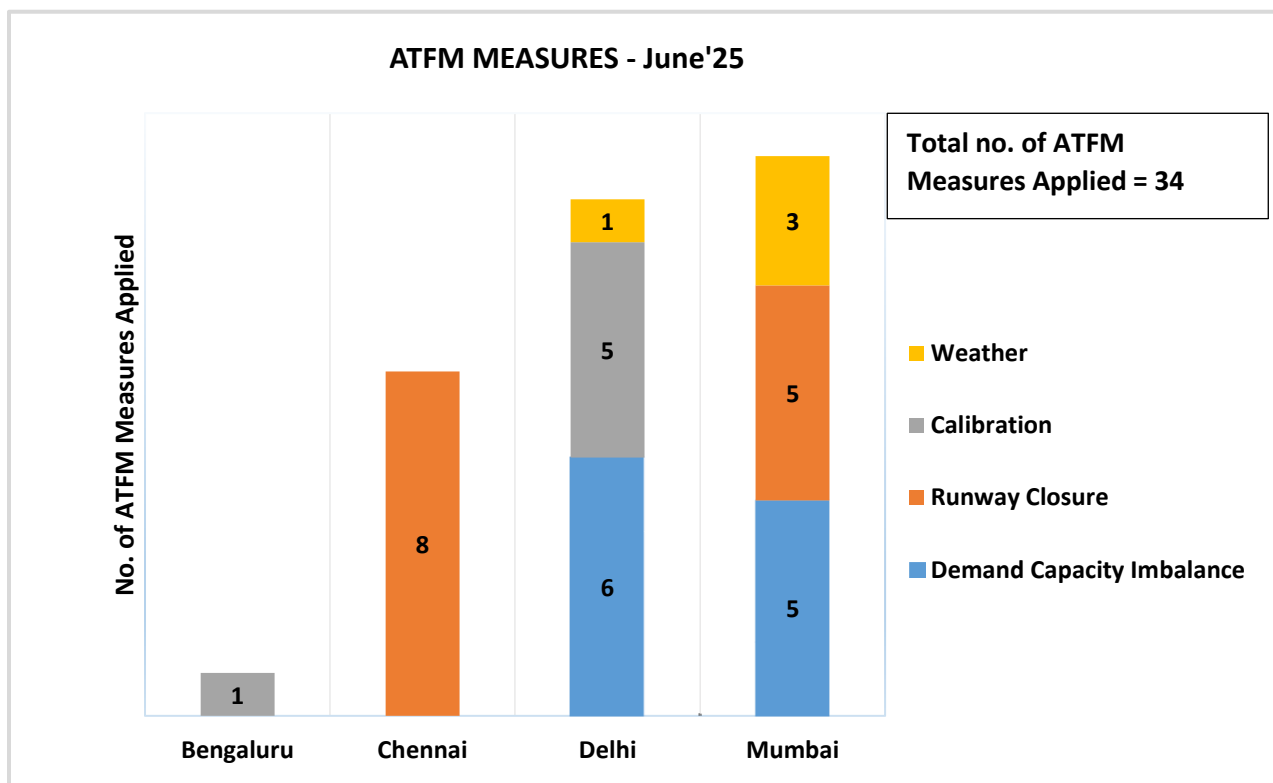


**Figure 9: ATFM Measures –June'25**

## II. एटीएफएम मेजर्स का अवलोकन/ATFM Measures Overview

| Constrained Airport | Bengaluru | Chennai | Delhi | Mumbai |
|---|---|---|---|---|
| Number of ATFM measures applied | 1 | 8 | 12 | 13 |
| Average ATFM Ground delay(in min) due to measures* | 27.1 | 27.9 | 14.6 | 25.6 |
| Maximum ATFM Ground delay(in min) due to measures | 47 | 65 | 53 | 82 |
| % Compliance | 92.3 | 98.6 | 97.5 | 99 |

Note: * $Average\ ATFM\ Delay = \dfrac{Total\ ATFM\ Delay}{Total\ Domestic\ Arrivals}$

| | |
|---|---|
| Total Arrivals | 2096 |
| Total International Arrivals(exempted) | 463 |
| Total affected flights in scenario (Domestic Arrivals) | 1633 |
| Total Domestic Arrivals with zero ATFM delay | 126 |
| Total Domestic Arrivals with ATFM delay | 1507 |
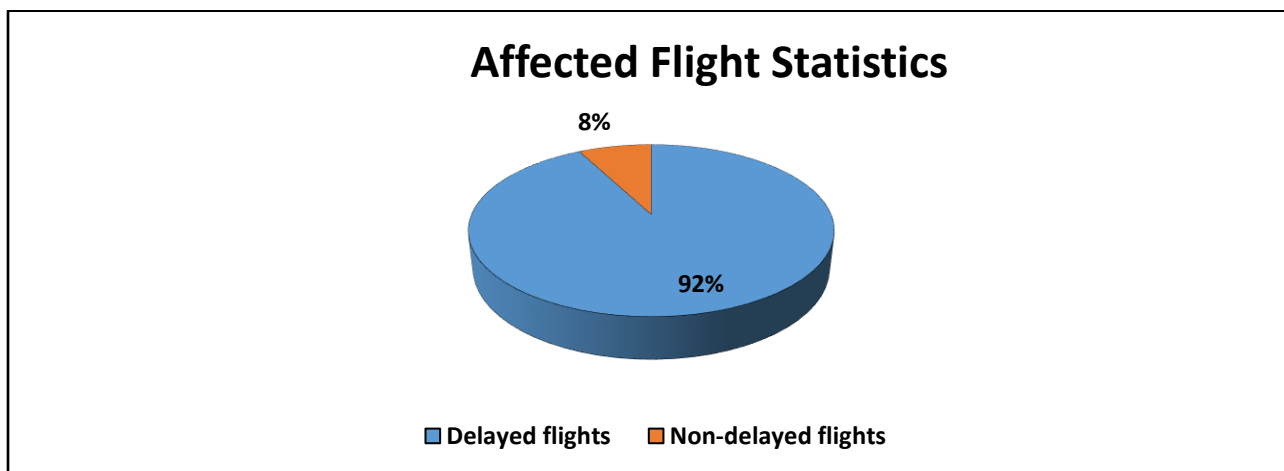


**Figure 10: Affected Flight Statistics –June'25**

## III. समग्र अनुपालन/Overall Compliance

| Total arrivals | 2096 |
|---|---|
| Domestic arrivals | 1633 |
| Flights with complete data (ATOT) | 1577 |
| Flights with incomplete data | 7 |
| Flights Not Operated | 49 |
| Compliant* | 1546 |
| Non-Compliant | 31 |

*Total No. of Revised CTOTs issued = 487 (Compliance calculation for flights which were issued revised CTOT is w.r.t. new CTOT issued)



**Overall Compliance**

2%

98%

■ Compliance   ■ Non-Compliance
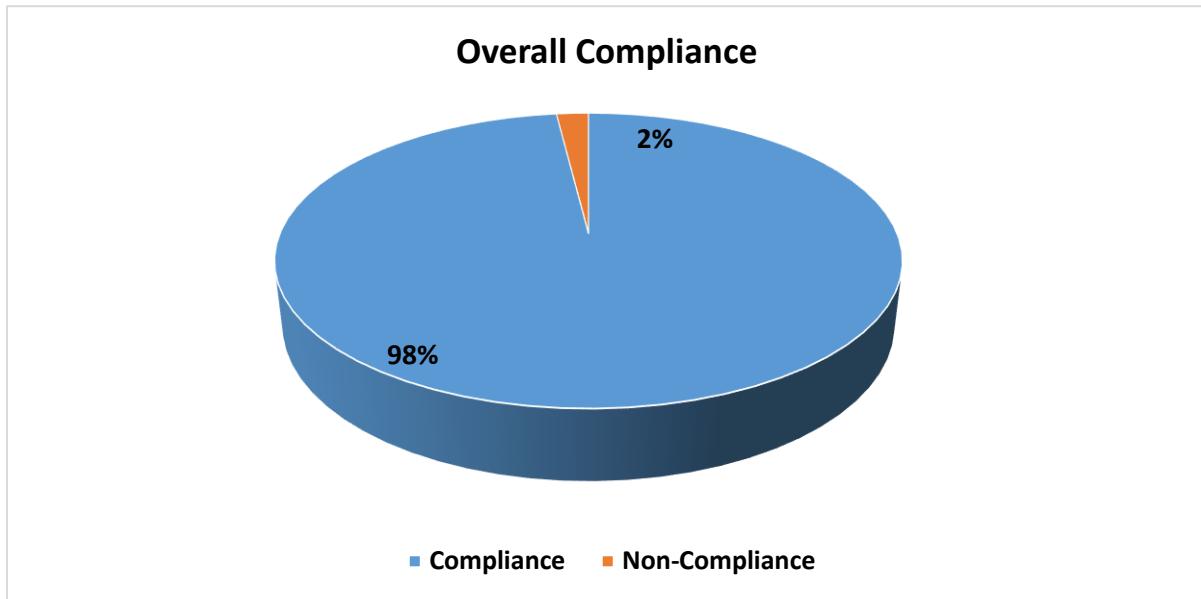
*Figure 11*: **Overall Compliance – June'25**

*NOTE: Flights with required data (i.e. ATOT) are only considered for compliance measurement*

**Out of the total domestic arrivals with complete data in the CDM scenario, 98% arrivals are compliant for the month of June 2025.**
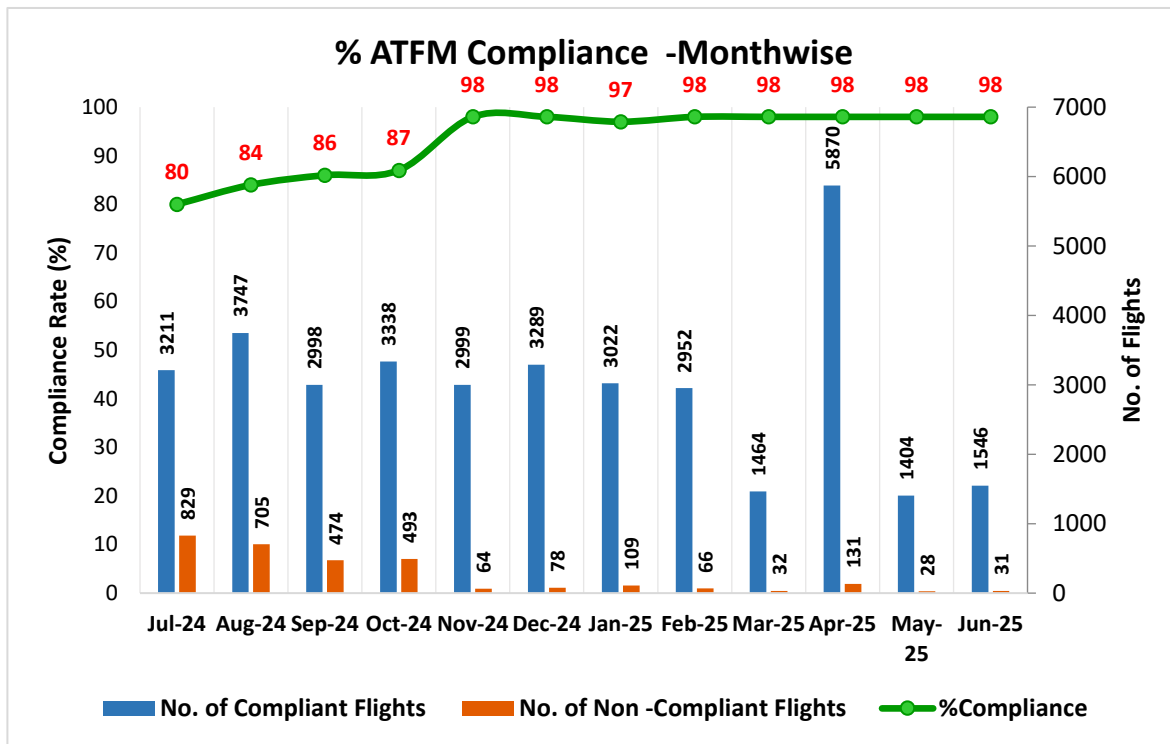
**Figure 12: Compliance(Monthwise)**

**Inference**

1.  Out of the total arrivals captured(2096 flights) during the CDM scenario for the constrained Airports, 77.9% of flights i.e. domestic arrivals(1633 flights) were candidates for ground delay(participating).
2.  Out of these Domestic Arrivals(1633), 92.3% (1507 flights) are assigned ATFM ground delay.
3.  Out of the total arrivals captured(2096 flights) to the constrained Airport during the ATFM scenario, 71.9% of flights(1507 flights) were assigned ATFM Ground Delay.

## IV. सीटीओटी अनुपालन दर -एयरपोर्टवाइज/CTOT Compliance rate – Airportwise

| MUMBAI FIR (97%)* | Compliant | Non Compliant | % Compliant |
|---|---|---|---|
| Ahmedabad | 46 | 1 | 98% |
| Aurangabad | 5 | 0 | 100% |
| Mumbai | 99 | 4 | 96% |
| Bhuj | 7 | 2 | 78% |
| Vadodara | 9 | 0 | 100% |
| Bhopal | 19 | 0 | 100% |
| Bhavnagar | 1 | 0 | 100% |
| Diu | 2 | 0 | 100% |
| Hirasar, rajkot | 11 | 0 | 100% |
| Indore | 19 | 0 | 100% |
| Jabalpur | 7 | 0 | 100% |
| Jamnagar | 7 | 0 | 100% |
| Kandla | 4 | 0 | 100% |
| Kolhapur | 2 | 0 | 100% |
| Nagpur | 13 | 0 | 100% |
| Nasik | 1 | 0 | 100% |
| Pune | 23 | 1 | 96% |
| Shirdi | 5 | 0 | 100% |
| Surat | 11 | 0 | 100% |
| Udaipur | 16 | 0 | 100% |
| KOLKATA FIR (98%)* | Compliant | Non Compliant | % Compliant |
| Prayagraj | 6 | 0 | 100% |
| Agartala | 4 | 0 | 100% |
| Ayodhya | 13 | 0 | 100% |
| Siliguri | 43 | 1 | 98% |
| Shillong | 0 | 1 | 0% |
| Varanasi | 34 | 0 | 100% |
| Bhubaneswar | 28 | 0 | 100% |
| Bilaspur | 2 | 0 | 100% |
| Kolkata | 78 | 0 | 100% |
| Chakeri | 1 | 0 | 100% |

| | Compliant | Non Compliant | % Compliant |
|---|---|---|---|
| Durgapur | 6 | 0 | 100% |
| Darbhanga | 13 | 0 | 100% |
| Deoghar | 3 | 0 | 100% |
| Gorakhpur | 9 | 1 | 90% |
| Guwahati | 36 | 4 | 90% |
| Gaya | 4 | 0 | 100% |
| Hollongi | 2 | 0 | 100% |
| Imphal | 2 | 0 | 100% |
| Jharsuguda | 5 | 0 | 100% |
| Aizawl | 2 | 1 | 67% |
| Dibrugarh | 6 | 0 | 100% |
| Dimapur | 3 | 0 | 100% |
| Patna | 37 | 0 | 100% |
| Ranchi | 24 | 0 | 100% |
| Raipur | 14 | 0 | 100% |
| **DELHI FIR (97%)*** | **Compliant** | **Non Compliant** | **% Compliant** |
| Amritsar | 17 | 0 | 100% |
| Bikaner | 5 | 0 | 100% |
| Bakshi Talab,Lucknow | 1 | 0 | 100% |
| Bhuntar | 1 | 0 | 100% |
| Bathinda | 1 | 0 | 100% |
| Bareilly | 1 | 0 | 100% |
| Chandigarh | 36 | 0 | 100% |
| Dehradun | 21 | 1 | 95% |
| Delhi | 111 | 1 | 99% |
| Kangra | 5 | 1 | 83% |
| Gwalior | 4 | 0 | 100% |
| Jodhpur | 5 | 0 | 100% |
| Jaipur | 21 | 0 | 100% |
| Jammu | 11 | 1 | 92% |
| Kota | 1 | 0 | 100% |
| Leh | 19 | 5 | 79% |
| Lucknow | 31 | 0 | 100% |
| Pithoragarh | 0 | 1 | 0% |
| Srinagar | 33 | 1 | 97% |
| Sirsa | 1 | 0 | 100% |

| CHENNAI FIR (99%)* | Compliant | Non Compliant | % Compliant |
|---|---|---|---|
| Hal Bangalore | 4 | 0 | 100% |
| Bangalore | 126 | 1 | 99% |
| Vijayawada | 18 | 0 | 100% |
| Coimbatore | 25 | 0 | 100% |
| Kochi | 44 | 1 | 98% |
| Calicut | 2 | 0 | 100% |
| MOPA Goa | 28 | 0 | 100% |
| Gulbarga | 1 | 0 | 100% |
| Goa | 43 | 0 | 100% |
| Hubli | 2 | 0 | 100% |
| Shamsabad, Hyderabad | 87 | 0 | 100% |
| Begumpet Hyderabad | 3 | 0 | 100% |
| Vijaynagar | 0 | 1 | 0% |
| Kannur | 9 | 0 | 100% |
| Madurai | 18 | 0 | 100% |
| Mangalore | 9 | 0 | 100% |
| Chennai | 58 | 0 | 100% |
| Port Blair | 10 | 0 | 100% |
| Rajahmundry | 5 | 0 | 100% |
| Shivamogga | 4 | 0 | 100% |
| Tuticorin | 8 | 0 | 100% |
| Tirupati | 1 | 0 | 100% |
| Tiruchirappally | 9 | 1 | 90% |
| Thiruvananthapuram | 17 | 0 | 100% |
| Visakhapatnam | 7 | 0 | 100% |

*FIR wise compliance rate (decimals rounded off to nearest integer value).

Note: The above list contains only those airports which had flights to the Constrained Airport and are affected by ATFM measures.

Airports with % compliance less than the average compliance(98%) for the month are highlighted in red.

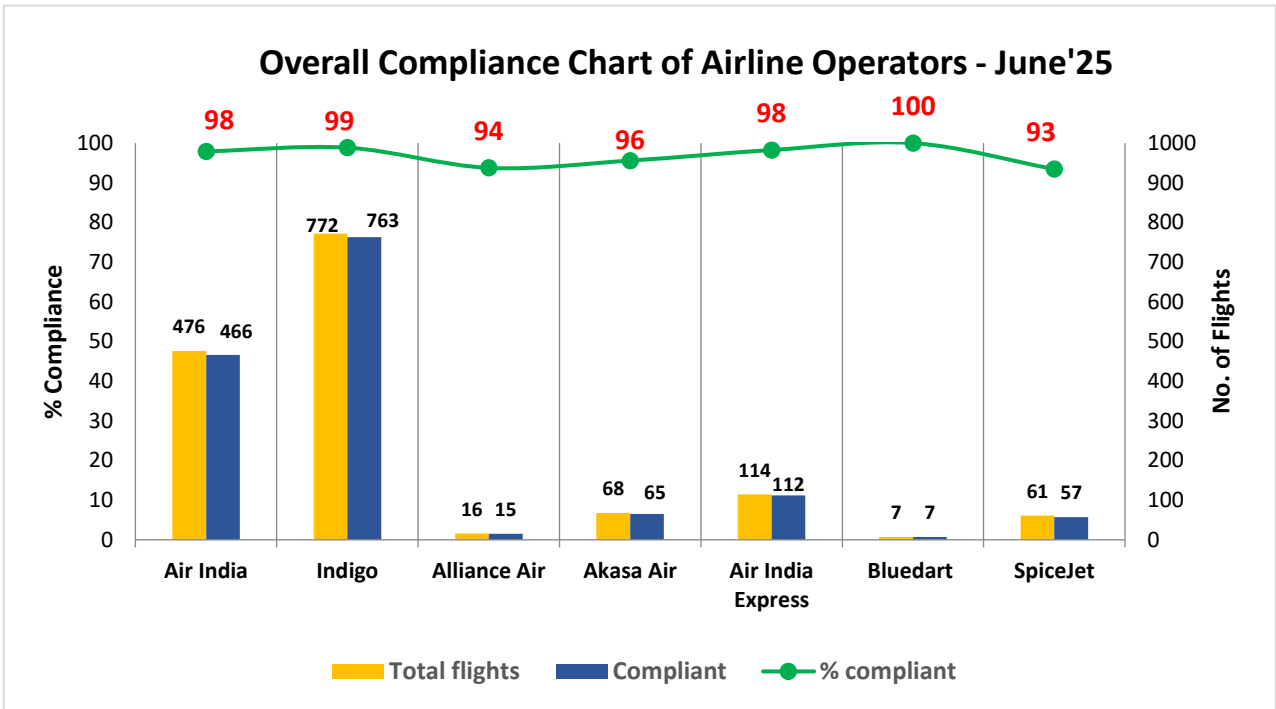## V. सीटीओटी अनुपालन दर- एयरलाइनवाइज़/CTOT Compliance rate – Airlinewise



**Figure 13: Airline wise Compliance –June'25**

**Inference**

1. Chennai region record the highest compliance of 99% whereas Delhi and Mumbai region has the lowest percentage compliance of 97%.

2. Air India, Air India Express,Blue dart and Indigo have a CTOT compliance higher than or equal to the average recorded compliance for the month of June'25.

## VI. गैर-अनुपालन का कारण/Reason For Non Compliance



**Reason For Non-Compliance**
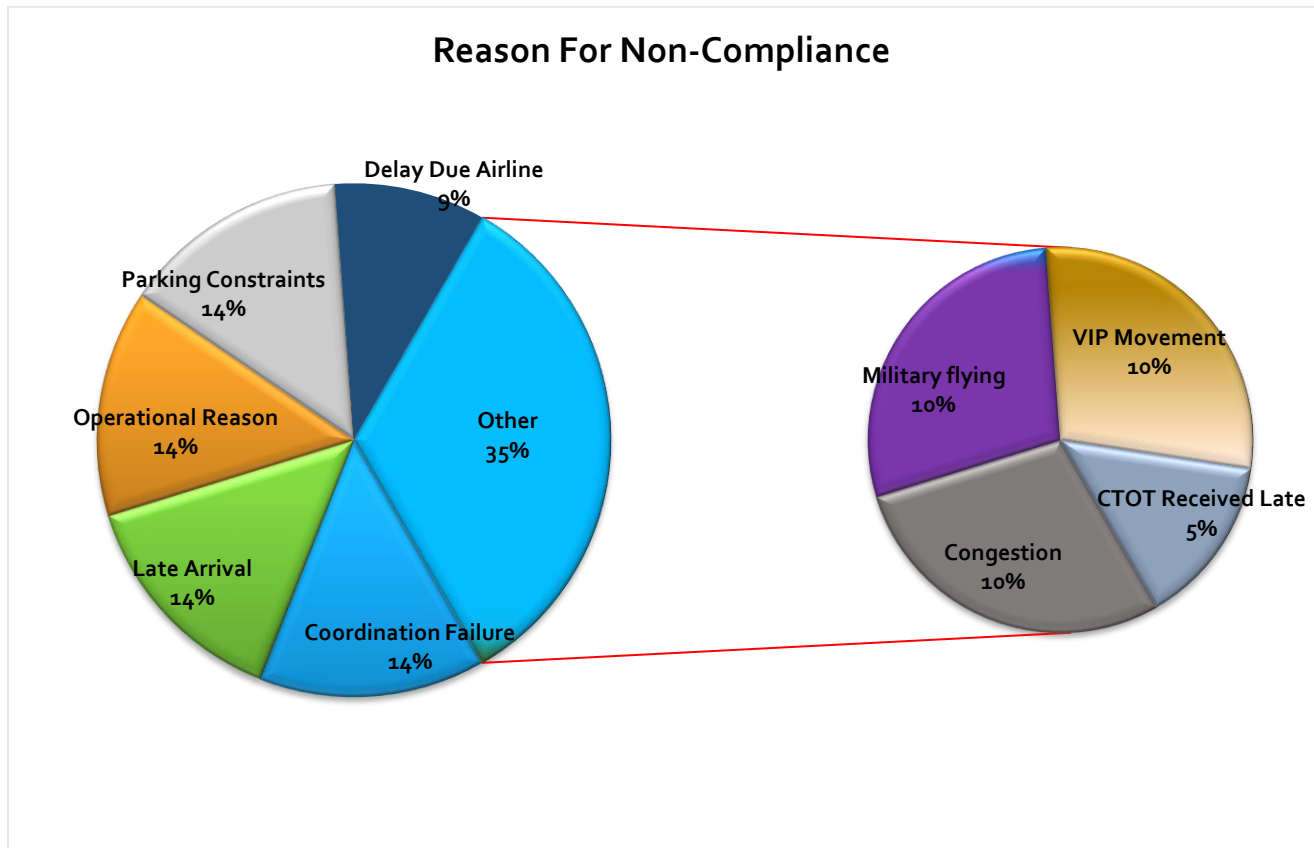
**Figure 14: Reason for Non-Compliance as provided by FMPs**

**Inference:**

1. 14 % of the CTOT Non- compliance was reported by concerned FMPs to be due to late arrivals from previous station.

2. 14 % of the CTOT Non- compliance was due to operational reasons (due to Bird Activity on Runway, ATC handling emergency etc) and 14 % of CTOT Non- Compliance was reported by concerned FMPs to be due to coordination failure.

3. 14% due to parking constarints at various airports and 10 % of the CTOT Non- compliance was due to ground traffic congestion at airports.

4. 9 % of the CTOT Non- compliance was reported by concerned FMPs to be due airline delay & 10% of the CTOT Non- compliance due to VIP Movement and Military flying at the concerned stations.

# VII.सीडीएम परिदृश्य अवधि के दौरान वायु विलंब/Air Delay during the CDM Scenario period

**Average Air Delay to domestic arrivals\* within the CDM Scenario period for Bengaluru, Chennai, Delhi and Mumbai was 6.5, 8.9, 12.3 and 17.5 minutes respectively.**

*\*Note: Only calculated for domestic arrivals with both ATOT and ALDT information*
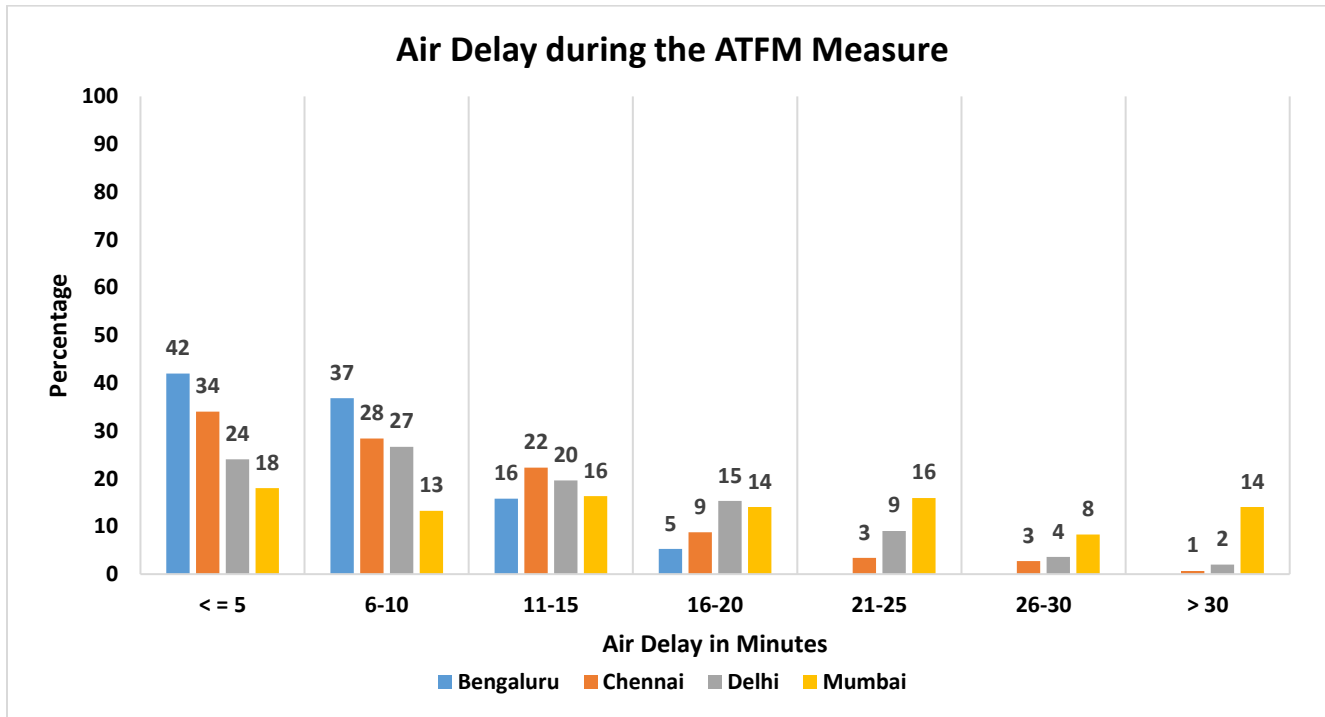


**Figure 15: Air Delay distribution during the CDM period**

**Inference**

1. 79% of domestic arriving flights to Bengaluru had an Air delay of equal to or less than 10 minutes during the CDM period.
2. 62% of domestic arriving flights to Chennai had an Air delay of equal to or less than 10 minutes during the CDM period.
3. 51% of domestic arriving flights to Delhi had an Air delay of equal to or less than 10 minutes during the CDM period.
4. 31% of domestic arriving flights to Hyderabad had an Air delay of equal to or less than 10 minutes during the CDM period.

## VIII. एटीएफएम उपायों के कारण मूर्त लाभ/Tangible Benefits due to ATFM Measures

A modest attempt is made to find out the tangible benefit of ATFM measures applied.

**Assumptions:**

•When ATFM measures are not in force, all flights take off at their ETOT where Estimated take off time(ETOT)= Estimated off block time(EOBT) + default taxi time

•All flights have an Estimated elapsed time(EET) as calculated by SKYFLOW using the Flight Plan information and Basic Aircraft data.

**Methodology:**

**Air delay (with ATFM measures in force**) is calculated during the period when ATFM measures are in force by summing the air delay for all the flights landing at constrained Airport.

i.e. **Total Air Delay = ∑ (Actual Flying time –  SKYFLOW calculated EET)**

Air delay (with no ATFM measures) is calculated as the sum of Air delay for all the flights during the above said period with no ATFM measures in place and the air delay for each flight is the difference in its ideal landing time and its ideal estimated landing time.

**Total Air Delay (with no ATFM measures)** = **∑ (Ideal LDT -  Ideal ELDT)**

*Ideal LDT is taken by assuming every flight is landing at a specified interval based on the Arrival acceptance rate(AAR) defined,

*Ideal ELDT = ETOT + SKYFLOW calculated Flying time

**Fuel Saving Calculation :**

Great Circle Distance(GCD)* was calculated for all the arrivals during the  ATFM Measure from the point of origin to destination. Assuming Airbus 320 as reference aircraft for flights (flight distance equal to or less than 3000 nm) and B777 for international flights (flight distance more than 3000nm):

Fuel consumption (Kgs / nm) for each affected flight in the scenario was then calculated using the Reference document: ICAO Carbon emissions calculator methodology, version10, Appendix C: ICAO Fuel Consumption Table.

The Fuel consumed per minute(Kg/min) was calculated for each affected flight.

Total Air Delay(with ATFM Measures)= 24675 mins

Total Air Delay (with no ATFM measures) = 33954 mins

Reduction in Air delay due to ATFM measures=  (33954-24675) = **9279 mins**

**Fuel Saving Calculation:**

Total Fuel saved during the ATFM Measure: ***7,04,716.3 Kg***

***Total reduction in CO$_2$ emission : 3.16(KgCO$_2$/kg fuel)\* 7,04,716.3*** Kg = 22,26,903.5 Kg

*\*GCD (Great Circle Distance): The distance between origin and destination airports is derived from latitude and longitude coordinates originally obtained from ICAO Location Indicators database.*

*3.16 = constant representing the number of tonnes of CO2 produced by burning a tonne of aviation fuel.*

# D. शब्दकोश/**Glossary**

| ***ATFM Parameters*** | **Definition** |
|---|---|
| ***Affected Flight statistics*** | An insight of participating traffic in the scenario i.e. ratio of the domestic arrivals to the constrained airport affected by ATFM measures (assigned delay by the Ground Delay Program) to the domestic arrivals not affected by ATFM measures (not assigned any delay) within the CDM scenario. |
| ATFM Ground delay | ATFM ground delay defined as CTOT-ETOT (Calculated take off time – Estimated take off time) |
| ***Average ATFM delay*** | $$\frac{Total\ monthly\ ATFM\ delay\ (in\ minutes)}{Total\ Domestic\ Arrivals}$$ |
| *Maximum ATFM delay* | Maximum ATFM delay (in minutes) assigned in the month |
| ***Overall compliance rate*** | Defined as monthly ATFM departure slot adherence rate of regulated flights. Flights having ATOT within theATFM Slot Tolerance Window (STW) of minus 5 to plus 10 minutes of CTOTs, are considered as compliant flights |
| ***CTOT Compliance rate of Airline operators*** | An overview of CTOT compliance rate of various Airline operators |
| ***CTOT Compliance rate of Airports within different Regions*** | An overview of CTOT compliance rate of Airports within 4 FIRs |
| Air delay statistics | Air delay defined as difference between AET & EET, whereAET(actual elapsed time) can be obtained from (ALDT-ATOT) and estimated elapsed time(EET)can be obtained from FPL/RPL  or (CLDT-CTOT). **Therefore, Air delay = AET-EET**<br><br>Average Air Delay is calculated as:<br><br>$$Average\ Air\ Delay = \frac{Total\ Air\ Delay\ to\ domestic\ arrivals\ (with\ values\ greater\ than\ zero)}{Total\ Domestic\ Arrivals}$$<br><br>*CLDT: Calculated Landing Time*<br>*CTOT: Calculated Take off Time*<br>*ALDT: Actual Landing Time*<br>*ATOT: Actual Take off Time* |

Annexure-A

**एयरलाइनों द्वारा सामान्य व्यावसायिक नियमों (सीबीआर) की उड़ान योजना आवश्यकताओं का अनुपालन - जून 2025**

Compliance by Airlines with Flight Planning Requirements of Common Business rules(CBR)-  June 2025.

## I. परिचय/Introduction:

Accurate and timely input in respect of flight intent is paramount to the correct traffic demand projection and eventually effective ATFM implementation. FPLs remain the main source of tactical demand prediction for ATFM systems. Early filing of error free FPL helps in improving the lead time required for ATFM measures and reduces the number of unexpected flights(pop-up). This in turn helps in improving the accuracy of demand-capacity imbalance prediction and optimizes slot utilization.

AIP India, ENR 1.9 section 4 on Flight Planning in the context of ATFM recommends Flight Planning requirements for all Airline Operators –
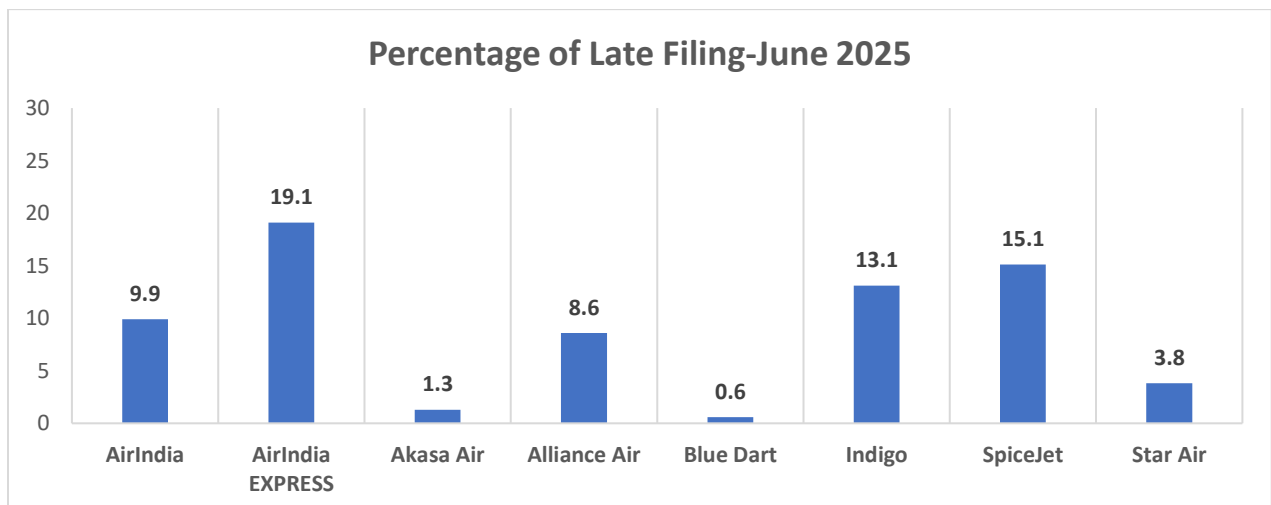
a) Flight plans shall be submitted at least 3 hours before the estimated off block time (EOBT);
b) The window for filing FPL is between 3 Hours and 120 Hours (Five days) before the EOBT. Earlier filing of FPL will give a realistic demand data to the CCC and hence the requirement of ATFM measures can be identified early for better planning. Late filing of a flight plan will lead to inaccuracies in predicting the demand and may lead to undesirable delay;"

## II. विश्लेषण/Analysis

A. An analysis has been conducted to find out the difference between the flight plan filing time and filed EOBT for all the FPLs received at ATFM system from 1st June 2025 to 30th June 2025.
The purpose of the analysis is to monitor the compliance with provisions of AIP India, section 4, ENR 1.9 regarding Flight Planning requirements in context of the ATFM.

This flight plan filing requirement has been reiterated through the recently agreed ATFM common business rules (CBR) document and is recognized as a metrics to be monitored regularly for any improvement.



**Percentage of Late Filing-June 2025**

| Airline | Percentage |
|---|---|
| AirIndia | 9.9 |
| AirIndia EXPRESS | 19.1 |
| Akasa Air | 1.3 |
| Alliance Air | 8.6 |
| Blue Dart | 0.6 |
| Indigo | 13.1 |
| SpiceJet | 15.1 |
| Star Air | 3.8 |

The table below lists number of filed flight plans (FPLs) with less than 3 Hours prior to EOBT:

| Name of Airline | Late Filed FPL | Total No. Of FPL | % Delayed Filing |
|---|---|---|---|
| AirIndia | 2085 | 21057 | 9.9 |
| AirIndia EXPRESS | 3002 | 15658 | 19.1 |
| Akasa Air | 60 | 4556 | 1.3 |
| Alliance Air | 149 | 1720 | 8.6 |
| Blue Dart | 4 | 626 | 0.6 |
| Indigo | 8739 | 66520 | 13.1 |
| SpiceJet | 516 | 3405 | 15.1 |
| Star Air | 51 | 1326 | 3.8 |
| **Total no. of FPLs for Scheduled Airlines** | **14606** | **114868** | **12.7** |

B.  For the analysis of non-receipt of DLA (Delay) messages for flight plans filed, the EOBT of FPL received has been compared with Actual Take off time (ATOT)received through DEP(Departure)messages.
Thus, only those FPLs were considered for analysis for which DEP messages were available and no associated DLA messages was received.

The Table below lists number of flights for which no DLA message was received in June 2025. **{(EOBT of original FPL)- (ATOT received)} > 30 minutes)**

| Name of Airline | DLA Message not received | Total No. of flights considered for analysis | % of flights for which no DLA message was received |
|---|---|---|---|
| AirIndia Express | 1948 | 9899 | 19.6 |
| AirIndia | 4600 | 15470 | 29.7 |
| Akasa | 536 | 3275 | 16.3 |
| Alliance Air | 146 | 698 | 20.9 |
| Blue Dart | 144 | 507 | 28.4 |
| Indigo | 5813 | 48995 | 11.8 |
| SpiceJet | 476 | 1810 | 26.3 |
| Star Air | 70 | 453 | 15.4 |

CCC-CATFM/2025/07/09

## Percentage of DLA Msg not received-June 2025
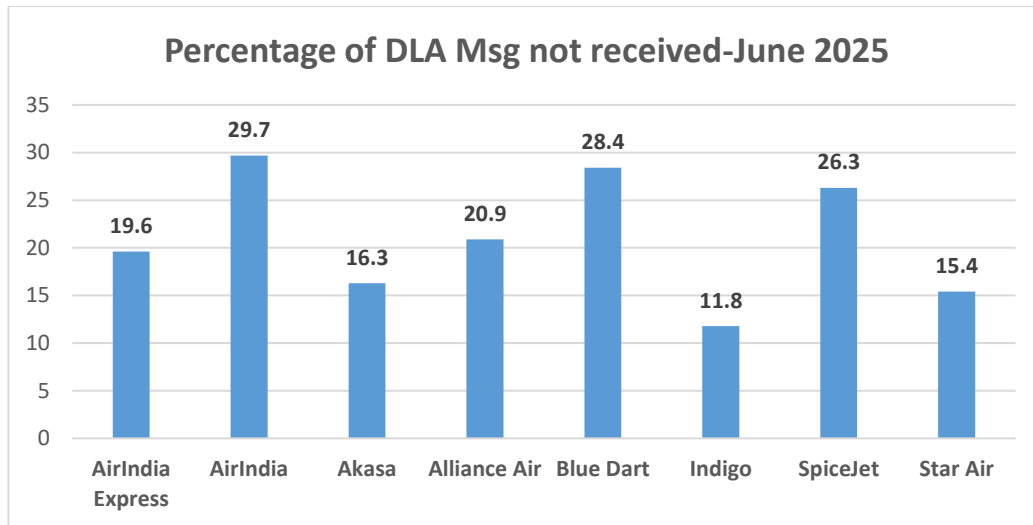


C.  For analysis of non-receipt of CNL (cancel) messages for June 2025, annulled FPLs were considered for which no CNL/DEP/DLA messages were received. A FPL gets annulled in SKYFLOW system, if it doesn't get activated through Dep message /surveillance data/ manual activation by FMP within a defined system parameter.

The table below lists the number of Flights for which no CNL Msg. was received in June 2025:

| Name of Airline | CNL message not received | No. of flights annulled |
|---|---|---|
| AirIndia Express | 80 | 88 |
| AirIndia | 115 | 128 |
| Akasa | 11 | 11 |
| Alliance Air | 223 | 223 |
| Blue Dart | 4 | 4 |
| Indigo | 170 | 173 |
| SpiceJet | 83 | 87 |
| Star Air | 16 | 19 |

**-End OF Report-**