STUDY ON EFFICIENT OPERATION AND MAINTENANCE COSTS

(RFP No. 02/2018-19)

for

CHHATRAPATI SHIVAJI MAHARAJ INTERNATIONAL AIRPORT, MUMBAI

2014-2019

by

R. SUBRAMANIAN AND COMPANY LLP

CHARTERED ACCOUNTANTS

initiated by

AIRPORTS ECONOMIC REGULATORY AUTHORITY OF INDIA

April 2020

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GLOSSARY

Abbreviations	Expansions
AAI	Airports Authority of India
ACI	Airports Council International
ACS	Access Control Systems
AERA/ Authority	Airports Economic Regulatory Authority
AGL	Airfield Ground Lighting
AMC	Annual Maintenance Contract
AMDB	Airport Mapping Database
AOA	Airport Operator Agreement
AOCC	Airport Operation Control Centre
AODB	Airport Operational Database
AOP	Annual Operating Plan
ASQ	Airport Service Quality
ATC	Air Traffic Control
ATM	Aircraft Movement
ATR	Action Taken Report
A&G	Administrative and General
BAC	Base Airport Charges
BRS	Baggage Reconciliation System
CAA	Civil Aviation Authority
CAGR	Compound Annual Growth Rate
CCTV	Control Centre Television Camera
CDM	Collaborative Decision-Making Module
CFT	Crash Fire Tenders
CIP	Continuous Improvement Plans
CISF	Central Industrial Security Force
CMC	Comprehensive Maintenance Contract
CPSD	Corporate Strategic & Planning Department
CSMIA	Chhatrapati Shivaji Maharaj International Airport
CSR	Corporate Social Responsibility
CUPPS	Common Use Passenger Processing Systems
CUSS	Common Use Self Service
CUTE	Common Use Terminal Equipment
DOP	Delegation of Powers
EPOS	Electronic Point of Sale
FAR	Fixed Asset Register
FIDS	Flight information display system
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GOI	Government of India
GRN	Goods Receipt Note
HVAC	Heating Ventilation and Air Conditioning

Abbreviations	Expansions
IATA	International Air Transport Association
IBLA	India Business Leader
ICWA	Institute of Cost and Works Accountants
IMB	(Interface Message Broker)
JVC	Joint Venture Company
KPI	Key performance indicators
LDA	Lease Deed Agreement
LLA	Land Lease Agreement
LLC	Limited Liability Partnership
MATV	Master Antenna TV
MCA	Ministry of Civil Aviation
MCD	Municipal Corporation of Delhi
MIAL	Mumbai International Airport Limited
MIS	Management Information System
MPAS	Mobile Phone Antenna Systems
MPPA	Million Passengers per annum
MRSS	Main Receiving Sub-Station
NFA	Notes for approvals
OMDA	Operation, Management and Development Agreement
OTP	On Time Performance
O&M	Operation and Maintenance
PA	Public Assembly
PAVA	Public Address System
PAX	Passengers
PBB	Passenger Boarding Bridge
PDPR	Personal Development and Performance Review
PIDS	Perimeter Intrusion Detection System
PO	Purchase Orders
PO&S	Public Order and Safety
PPE	Plant, Property and equipment
PR	Purchase Requisition
PTB	Passenger Terminal Building
RAB	Regulatory Asset Base
RFQ	Request for Quotation
RVR	Runway Visual Range
SA	Shareholders' Agreement
SDR	Special Drawing Rights
SE	Service entry
SGSA	State Government Support Agreement
SOP	Standard Operating Procedures
SSA	State Support Agreement
STP	Sewage Treatment Plant
T1	Terminal 1
T2	Terminal 2
TMRS	Tetra Mobile Radio Systems

Abbreviations	Expansions
UDF	User Development fee
UFIS	Universal Flight Information System
VFD	Variable Frequency Drive
VHT	Vertical Horizontal Travellator
VIM	Vendor Invoice Management
WPI	Wholesale Price Index
YTD	Year to date

STATEMENT OF CONFIDENTIALITY

This report has been prepared by M/s. R Subramanian and Company LLP, Chartered Accountants, an Indian Limited Liability Partnership as part of its deliverables under the engagement awarded as per RFP No. 02 dated 27th November 2018 floated by the Airports Economic Regulatory Authority of India ("AERA" or "Authority"). This document is being submitted to AERA for use in connection with the tariff determination of Chhatrapati Shivaji Maharaj International Airport, Mumbai ("MIAL"). This report or its contents may not be shared with anyone except with the consent of AERA. R Subramanian and Company LLP shall not have any liability for the unauthorized use or distribution of this document.

PREFACE

Establishing efficient operation and maintenance costs and their reasonableness is pivotal to the effective execution of tariff determination for Aeronautical services. This expenditure has consistently been increasing, driven by investments in expanding, modernizing and sustaining airport efficiency and excellence.

Assessment of Operation and Maintenance cost requires the Authority to periodically examine not only the financial information submitted by the airport operator, but also independently examine the baseline operating cost levels, cost reduction, efficiency initiatives, benchmarking exercises undertaken by the airport operator etc.

Additionally, the Authority observes the growing influence of IT as a cost driver owing to its deployment in almost all airport facilities and services. This has resulted in increase in costs driven by third party execution of IT products and/or services and various tangible and intangible expenses originating under innovative transaction methods with varying degrees of in-house and third-party involvement.

Given the above circumstances, AERA deemed it necessary to conduct an independent study in the area of determination of Efficient Operation and Maintenance costs, before considering these costs as part of tariff determination exercise.

TERMS OF REFERENCE AND OUR WORK PERFORMED

The detailed scope of this engagement as stipulated under the Schedule-1, Terms of Reference of RFP No. 2/2018-19 of AERA, have been provided below. The scope entails determination of efficient Operation and Maintenance costs and segregation into Aeronautical and Non-aeronautical costs for MIAL.

EXTRACT OF TERMS OF REFERENCE FROM PARAGRAPH 3 OF SCHEDULE - 1 OF RFP NO. 2/2018-19

*a) Examine the **Quality & Adequacy of Processes** employed by the Airport operator and establish that cost collection, recording, controlling processes & systems are adequate to ensure correct and complete capture of costs, in reference to internal & external reports including MIS and Budgets.*

*b) Ensure that **Quality of Cost Capture process** is aligned with key project documents/agreements and do not violate philosophy, guidelines, directions, Orders stipulated by the Authority.*

*c) Examine **Measurement & Quantification** processes employed, by conducting activities including*

- *Identification and understanding of drivers of cost and determinants of cost levels*
- *Study cost behaviour and patterns from perspectives such as ABC analysis, fixed vs variable costs, controllable vs uncontrollable costs, Recurring vs Non-recurring etc.,*
- *Study cost segregation between Aeronautical and Non-aeronautical costs from services/activities, revenues, assets perspectives, methods used to achieve segregation, the common pool of costs identified, the allocation ratios used to split common cost pool.*
- *Peruse the periodic management reports that discuss cost reduction initiatives, cost variance reports and examine the Key performance indicators (KPIs) assessing cost productivity and efficiency.*
- *Study/Benchmark the KPIs both inter-airport and intra-airport including both domestic and international airports in the ambit of the study.*
- *Ensure measurement and quantification of costs are aligned to methodologies, directions, guidelines stipulated by Authority and relevant project documents/agreements.*

*d) **Assess reasonableness** in reference to scale of operations & **determine efficient** operation and maintenance costs by*

- *Incorporating learnings gained from 3 a) b) and c)*
- *Relate the costs to cost constraints, cost advantages that operate in the airport operator's cost environment ; strategic features in the airport operator's business environment; the significant infrastructural facilities; key customer and consumer touch points; primary Aeronautical and non-Aeronautical activities & principal revenue streams & service lines of the airport*

e) Detailed study and examination of the contractual arrangement and transaction/s between DELHI airport and the IT JV [clause 6.111 – 6.112 supported by 6.103 -6.110 in Order No. 40/2015-16 dated 8th December, 2015 issued 10th December, 2015 in the Determination of Aeronautical Tariffs in respect of Indira Gandhi International Airport, Delhi for the Second Control Period (01.04.2014 - 31.03.2019) issued by Airport Economic Regulatory Authority of India,].
Study should establish an understanding of this joint business arrangement, the services envisaged under this contract, understand the transactions conducted, the costs incurred, the revenue streams earned due to the use of the services of such ITJV and segregation into Aeronautical and Non-aeronautical, impact on the tariff / true up exercise.

*f) Prepare **Report and Recommendations** detailed as under*

Report to include the following sections:

f.1) General application across Major Airports

*A typical **efficient** operations and maintenance cost environment, the cost structure and customary cost line items and cost drivers. Define this in context of the size/volume, key infrastructural facilities, the primary Aeronautical and Non-aeronautical activities, key customer and consumer touch points, the service lines and revenue streams of the airport that determine an airport's cost environment*

- *Recommendations that will serve as guide to ensure reliability and completeness of cost capture*
- *Recommendations to aid correct measurement and quantification of costs in reference to airport operator's scale of operations*
- *Recommendations for standards that would serve as guidelines for segregation into Aeronautical vs. Non-aeronautical costs including allocation methodologies for common costs segregation into Aeronautical & Non-aeronautical costs including illustrative cases in/ learnings from global scenario.*
- *Guidelines to establish optimal cost levels to Aeronautical & Non-aeronautical activities, revenues and assets including illustrative cases in/learnings from global scenario.*
- *Recommendations to identify strategic influencers of an airport's cost environment such as cost advantages and cost constraints including illustrative cases in/learnings from global scenario.*
- *Any other factors that the consultant feels has significant bearing on the report*

f.2) IT cost environment and guidelines for monitoring its effectiveness

- *Optimal mix of outsourcing vs in-house servicing in IT tasks*
- *Systemic controls that airport operator must execute in IT cost and supplier management in general and especially in supplier concentration scenarios.*
- *Measurement and monitoring IT spend effectiveness, role of SLAs in reducing or controlling outsourced costs etc., and*
- *Any other matter that the consultant feels has significant bearing on comprehending IT cost environment of the airport operator.*

f.3) Quality of cost capturing and its reasonableness

- *The existing Operation & Maintenance cost environment, the quality of processes of cost capture, the reasonableness of costs.*
- *The Variances and/or inconsistences prevalent with respect to present practices in determination of Efficient costs, suggestions for rectification/improvement of cost capture/measurement processes;*
- *Impact of such efficient costs on the tariff determination exercise specifically explaining short, medium and long-term consequences if any.*
- *Determination of the revised Efficient operation and maintenance cost.*

f.4) Detail observations on Aeronautical and Non-aeronautical costs with respect to

- *Existing segregation process and amount;*
- *Recommendations that would serve as guidelines for segregation into Aeronautical vs Non-aeronautical costs including allocation methodologies for common costs segregation;*
- *Determination of the revised Aeronautical and Non-aeronautical costs*

f.5) Any other factors that the consultant feels has significant bearing on the report including learnings from relevant airports operating in other countries

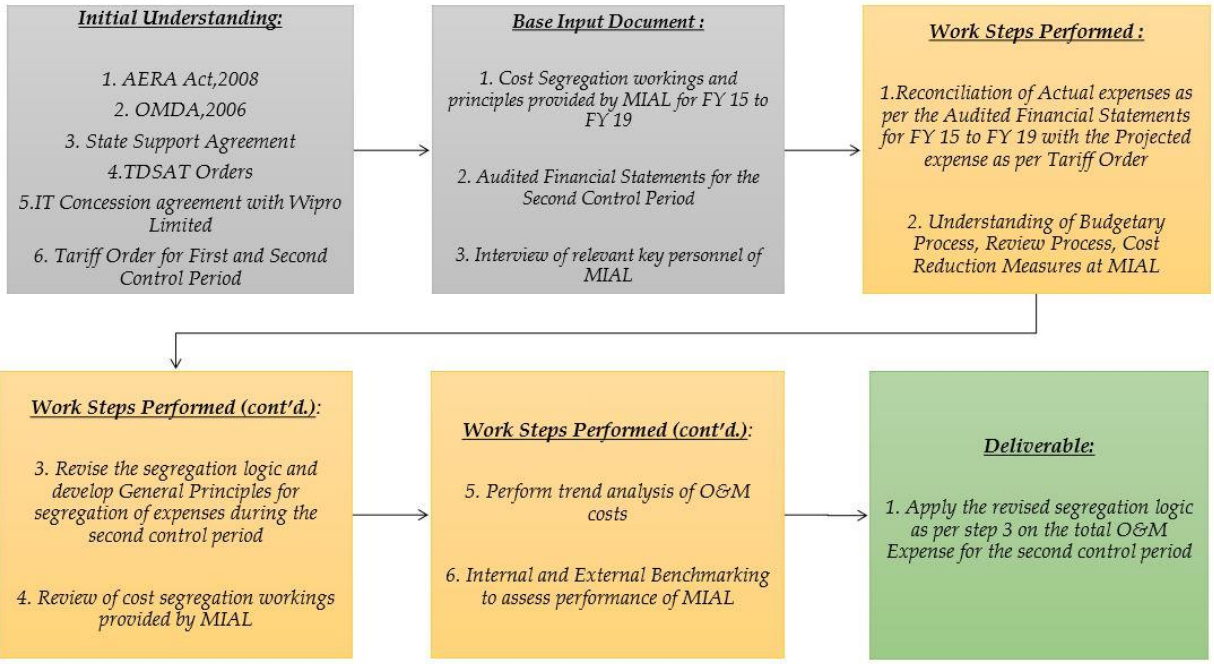
The above should include specific sections detailing IT cost environment and guidelines for the same including discussions on

- *Existing Mix and optimal mix of outsourcing vs in-house servicing in IT tasks*
- *Existent Systemic controls and improvements that airport operator must execute in IT supplier management in general and especially in supplier concentration scenarios.*
- *Measurement and monitoring IT spend effectiveness, role of SLAs in reducing or controlling outsourced costs etc., and*

Any other matter that the consultant feels has significant bearing on comprehending IT cost and supplier environment of the airport operator.

Steps for our work performed

The flowchart detailing the steps followed to complete the report is given below:



S. No	Work Steps Performed	Reference to TOR of RFP 02/2018-19	*Reference to Report*
1.	Our study on segregation and efficient operation and maintenance cost is based on the expense segregation workings provided by MIAL (FY15 to FY19), audited financial statements (FY15 to FY19), treatment adopted by AERA in respect of certain expenses for previous control periods and information provided to us by the management of MIAL.	*NA*	*NA*
2.	We initiated our study by familiarizing ourselves with the statutes and documents described in section 2 of this report and MIAL approach to segregation of expenses into Aeronautical and Non-aeronautical as described in section 10.1 of the report. We assessed the nature of costs incurred based on parameters such as recurring vs. non-recurring, fixed vs. variable and controllable vs. uncontrollable cost.	*NA*	*NA*

S. No	Work Steps Performed	Reference to TOR of RFP 02/2018-19	*Reference to Report*
3.	We interacted with MIAL's finance team to understand the process followed for recording of costs and tested documents on sample basis to ensure that the cost capturing process.	*3a*	*NA*
4.	We reviewed the budgetary process followed by MIAL (development of Annual Operating Plan at the beginning of the Financial Year) with respect to determination of budgets for the various cost categories, approval of budgets and the process followed for its monitoring.	*3b*	*Section 3.1*
5.	We then interacted with various cross functional teams such as Projects & Engineering (P&E), Quality etc. to understand the various cost savings measures/ continuous improvement plans developed and implemented by them to achieve efficiency/ Business Excellence in the overall operations of the Airport and the related costs	*3c*	*Section 3.3*
6.	We compared the total operation and maintenance expenses as considered in the true-up section of the MYTP for Third Control Period with the audited financial statement of the respective years of Second Control Period and the initial cost projection adopted by AERA as per the Tariff Order for the Second Control Period.	*NA*	*Section 2.4*
7.	A basis for determining the proportion of segregation of Common costs into Aeronautical and Non-aeronautical was derived We reviewed the workings shared with us by MIAL relating to segregation of expenses as submitted in the true-up section in the MYTP for Control Period-III. We assessed the classification of expenses by the narration of expenses in the workings provided to us for our review and only in respect of expenses / purchase orders / service order with total annual expense value more than ₹ 50 lakhs.	*3d*	*Section 2.5*
8.	We have reclassified the expense item wherever we differed with MIAL on segregation. Additional information was sought from MIAL wherever needed to quantify the impact of a change in the segregation logic.	*3d*	*Section 2.5*
9.	After determining the increase in the scale of Operations of the Airport, we performed a trend analysis of the Operation and Maintenance costs for the Second Control Period based on audited financial statements and compared the same to the increase/decrease in operations. The increase in the annual expense for the Second Control Period was compared to the increase in the scale of operations to eliminate its effect in the increase of total spend. The per PAX/per ATM costs year on year were then compared and for any increase/decrease beyond 25% of the immediate previous year, a root-cause analysis was performed to assess other factors like improvement plan implementation, increase in wage rates, one-time expenses, etc. attributing to the upward trend or downward trend in expenses if any.	*3d*	*Section 3.4*

S. No	Work Steps Performed	Reference to TOR of RFP 02/2018-19	*Reference to Report*
10.	We performed internal and external benchmarking of the above cost categories to assess performance of MIAL over a period and against domestic and international airports.	*3d*	*Section 4*
11.	We studied examined the IT costs incurred by them and the basis for appropriately segregating the IT costs in to "Aeronautical" and "Non-aeronautical".	*3e*	*Section 15 & 16 of RFP 03/2018-19 MIAL report*

1 BACKGROUND

1.1 Objective of the engagement

The objective of the engagement is to conduct an independent study in the area of determination of Efficient Operation and Maintenance costs, before considering these costs as part of tariff determination exercise by studying and considering:

1) The Airports Economic Regulatory Authority of India Act, 2008
2) Operation, Management and Development Agreement (OMDA) between Airports Authority of India and Mumbai International Airport Limited, dated 4th April 2006
3) State Support Agreement of the Mumbai Airport between The President of India on behalf of The Government of India and Mumbai International Airport Limited (now Mumbai International Airport Limited), dated 26th April, 2006
4) State Support Agreement of the Mumbai Airport between Government of Maharashtra and Mumbai International Airport Limited (now MIAL), dated 27th April, 2006
5) Orders of Telecom Disputes Settlement and Appellate Tribunal (TDSAT)
6) Information Technology Concession Agreement between Mumbai International Airport Limited and Wipro Limited
7) Audited Financial statements, documents and records of, and discussions with management of MIAL

1.2 Profile of CHHATRAPATI SHIVAJI MAHARAJ INTERNATIONAL AIRPORT (CSMIA)

In the year 2003, the Airports Authority of India Act, 1994, was amended to enable setting up of private airports and leasing of existing airports to private airports. The Amendment Act of 2003 was brought into effect on 1st July 2004. In pursuance thereof, the Government of India (GOI) had approved the modernization, up-gradation and development of the Delhi and Mumbai airports through private sector participation. Airports Authority of India (AAI) initiated the process of selecting a lead partner for executing the modernization projects and undertook a competitive bidding.

A consortium led by the GVK Group was selected for modernisation of the Airport. Post selection of the private consortium a special purpose vehicle, namely Mumbai International Airport Private Limited (MIAL), was incorporated on 2nd March 2006 with AAI retaining 26% equity stake and balance 74% of equity capital acquired by other members of consortia. The GVK consortia comprised GVK Airport Holdings Ltd, ACSA Global Limited and Bid Services Division (Mauritius) Ltd. On 4th April 2006, MIAL signed the Operation, Management and Development Agreement (OMDA) with AAI.

In addition to the OMDA, MIAL entered into various agreements (as listed below) with AAI, Government of India and the Government of Maharashtra to give effect to the process of transactions:

1. State Support Agreement (SSA) of Government of India
2. Shareholders' Agreement (SHA)
3. CNS-ATM Agreement
4. Airport Operator Agreement (AOA)
5. State Government Support Agreement (SGSA) of Government of Maharashtra
6. Lease Deed Agreement (LDA)
7. Substitution Agreement
8. Escrow Agreement

Currently, CSMIA serves as a major hub or a focus destination for several Indian carriers including Indigo, SpiceJet, Go Air, Air Asia and Vistara. It serves 46 International airlines across the world.

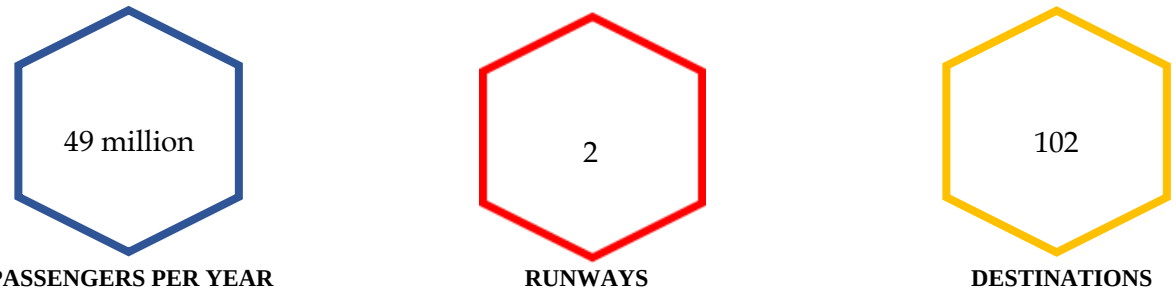
The salient features of Chhatrapati Shivaji Maharaj International Airport were[1]:

- CSMIA is one of the three airports in India to have implemented Airport Collaborative Decision Making (A-CDM) to ensure timely take-off and landing.
- The airport has two operating terminals spread over a total land area of 750 hectares (1,850 acres) and handles about 950 aircraft movements per day.
- A dedicated six lane elevated road connects the new integrated terminal 2 with the main arterial Western Express Highway.
- India's second tallest Air traffic control tower with a height of 85 m (279 ft.) after Delhi airport (101.9 m) stands in a section of the parking area opposite terminal 1B.
- Terminal 2 has state-of-the-art complex featuring Common Use Terminal Equipment (CUTE)
- Access to the aircraft from the terminal is provided by 2 piers.

[1] Wikipedia and MIAL

- Terminal 2 is a state-of-the-art 4 level integrated terminal with an area of over 2,439,000 sq. mtrs. and includes new taxiways and apron areas for aircraft parking designed to cater to 40 million passengers and one million tons of cargo annually.
- Terminal 2 is completely designed keeping in mind principles of Green Building design and have successfully achieved LEED Gold rating for design and IGBC Platinum rating for construction and operation in 2016
- Aerobridges (11) and Airline check-in counters (67) for Terminal 1 whereas Aerobridges (29) and Airline check-in counters (188) for Terminal 2

1.3 Traffic Analysis



It is the second busiest airport in the country in terms of total and international passenger traffic after Delhi and was the 14th busiest airport in Asia and 28th busiest airport in the world by passenger traffic in calendar year 2017.

Along with Delhi airport, it was adjudged the "World's Best Airport" at Airport Service Quality Awards 2017 in the highest category of airports handling more than 40 million passengers annually by Airports Council International.

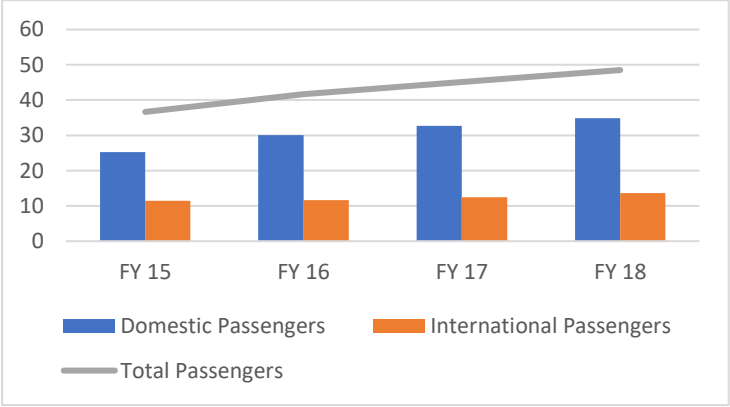
1.3.1 Passenger traffic movement

Domestic and International Passenger traffic at MIAL Airport, Mumbai during the Second Control Period FY 15 to FY 18 is indicated in Table 1 below:

Table 1: Domestic and International Trend for Passenger Movement during Second Control Period (in million)

	FY 15	FY 16	FY 17	FY 18	CAGR
Domestic Passengers	25.21	30.04	32.72	34.85	8.43%
International Passengers	11.43	11.62	12.44	13.65	4.55%
Total Passengers	36.64	41.67	45.16	48.50	7.26%

Figure 1: Passenger Traffic Movement



Mumbai being known the financial capital of India, traffic in its airport responds to the growth of the Indian economy. Growth in the passenger traffic is a combination of economic growth, role of low-cost carriers and other demographic factors. It can be noticed that the domestic air traffic has been the predominant driver behind the CAGR of 7.26% in the passenger traffic of CSMIA.

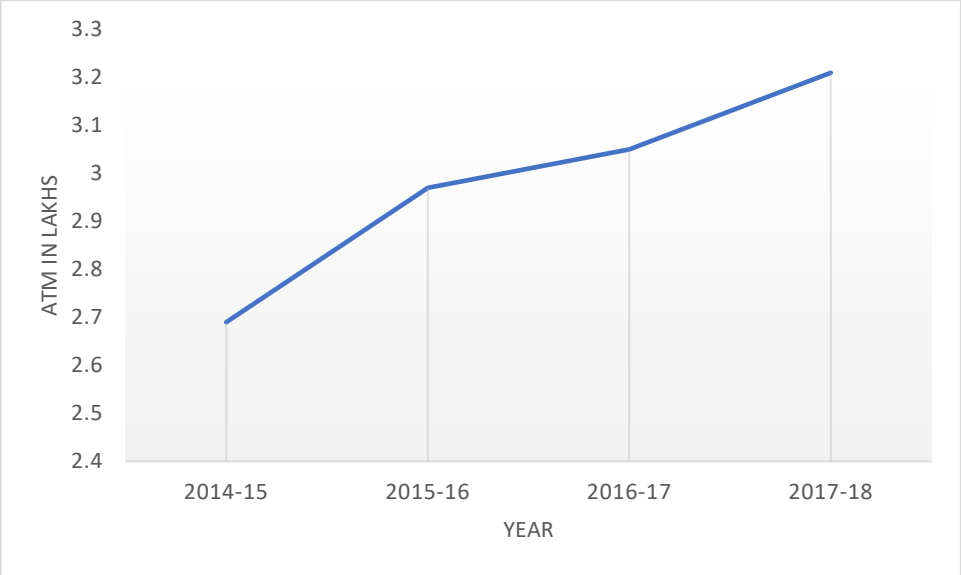
1.3.2 Air traffic movement

The Total Air Traffic Movement (ATM) at MIAL Airport (Landed Flights), Mumbai during the Second Control Period FY 15 to FY 18 is indicated in Table 2 below:

Table 2: Air Traffic Movement during Second Control Period (in lakhs)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Total ATM	2.69	2.97	3.05	3.21	6.07%

Figure 2: Total Air Traffic Movement



For a CAGR of 7.26% in passenger movement, 4.52% CAGR in ATM is reported. This could be due to various factors such as better seat occupancies, upgradation to bigger aircrafts especially by low cost carriers.

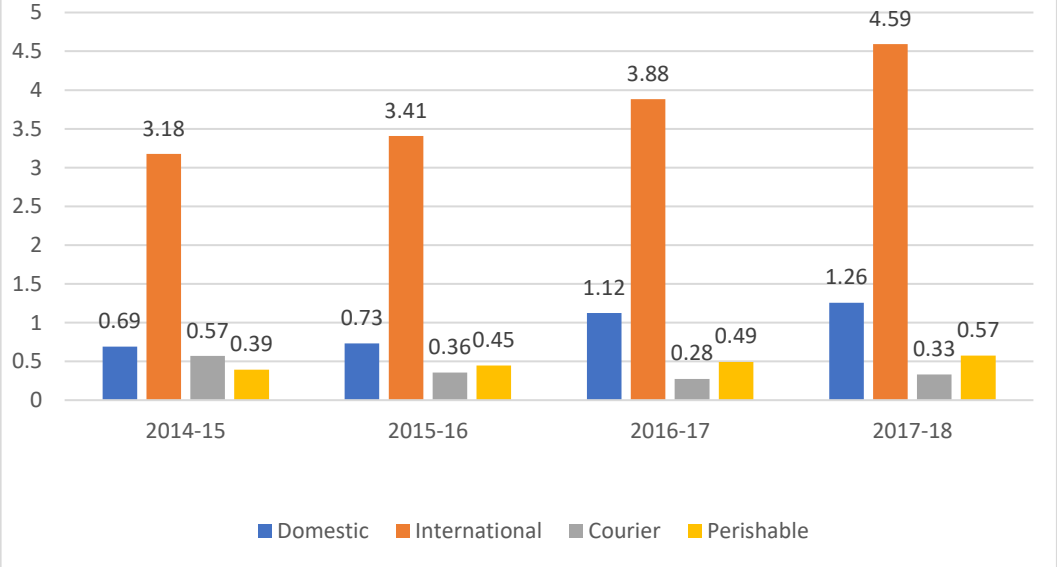
1.3.3 Cargo movement

The cargo traffic at MIAL during the Second Control Period FY 15 to FY 18 is indicated in Table 3 below:

Table 3: Cargo Movement during Second Control Period (in lakhs)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Domestic	0.69	0.73	1.12	1.26	16.16%
International	3.18	3.41	3.88	4.59	9.66%
Courier	0.57	0.36	0.28	0.33	-12.64%
Perishable	0.39	0.45	0.49	0.57	9.78%
Total Cargo	4.83	4.94	5.78	6.75	8.74%

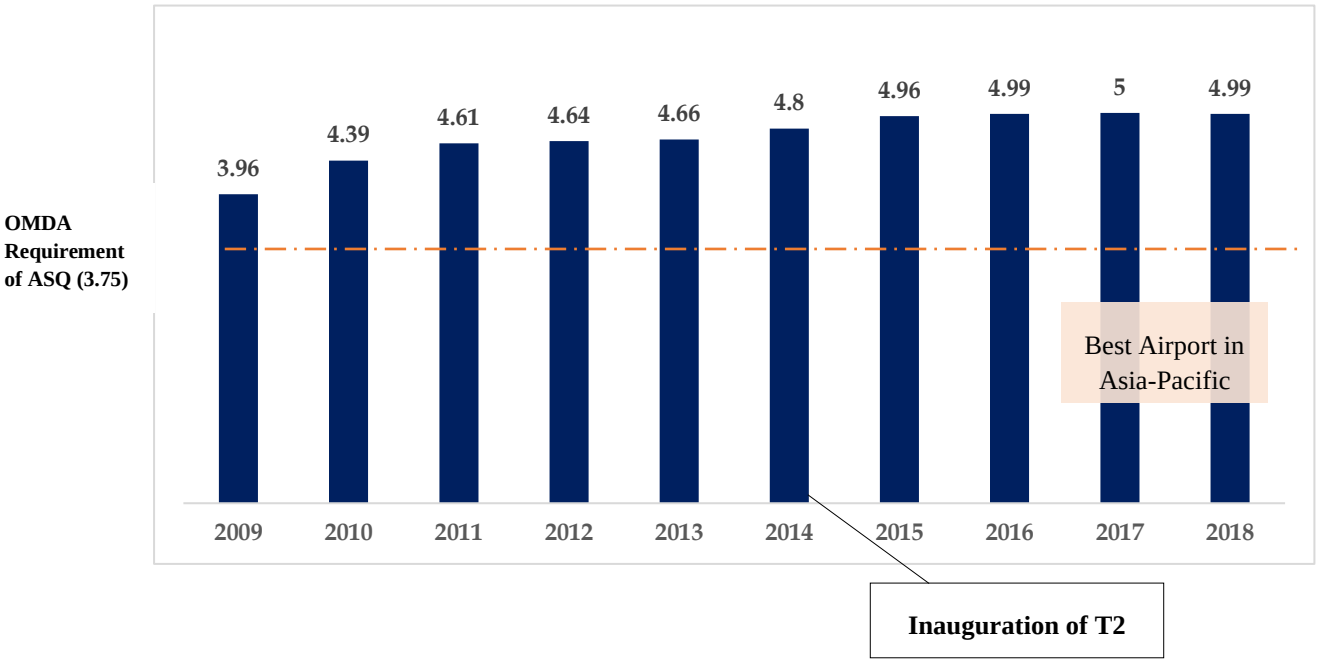
Figure 3: Cargo Movement



Inventory build-ups, augmented export orders, strengthening of consumer demand and increase in online purchases, were important drivers that translated into CAGR of 8.74% in air cargo volumes.

1.4 Airport service quality[2]

CSMIA is one of the world's busiest airports with a total passenger count of 45.15 million and 48.50 million during FY 17 and FY 18 respectively. CSMIA was voted the best in the category by the air travellers in the largest, annual global airport customer satisfaction survey conducted by Skytrax, an international air transport rating organisation. It bagged the top award for the 'Best Airport in India and Central Asia' by Skytrax at the World Airport Awards held at Passenger Terminal EXPO in Stockholm, Sweden on March 21, 2018. "Best Metro Airport award" and the "Airport offering best facilities for sick, elderly & physically challenged" for 2017-18 by Air Passenger Association of India (APAI). Please refer to Table 111 of this Report for parameter-wise details of ASQ. For the quarter ended 31st March 2019, the ASQ rating of the MIAL was 4.99 out of 5 (Domestic) and 5 out of 5 (International).



[2] Sustainability Report 2018

1.5 Chapter summary

- A consortium led by the GVK Group was selected for modernisation of the Airport. Post selection of the private consortium a special purpose vehicle, namely Mumbai International Airport Private Limited (MIAL), was incorporated on 02.03.2006 with AAI retaining 26% equity stake and balance 74% of equity capital acquired by other members of consortia.

- The salient features of CSMIA include two operating terminals, dedicated six lane elevated road to the newer Terminal 2, India's second largest ATC tower, state-of-the-art 4-level integrated terminal achieving LEED Gold rating for design and IGBC Platinum rating for construction, as well as 11 aerobridges and 67 airline checking counters for Terminal 1, and 29 aerobridges and 188 airline checking counters for Terminal 2.

- CSMIA is the second busiest airport in the country in terms of total and international passenger traffic after Delhi and was the 14th busiest airport in Asia and 28th busiest airport in the world by passenger traffic in calendar year 2017.

- CSMIA has seen annual passenger traffic of 7.26%, annual ATM growth of 4.52% and annual cargo movement growth of 8.74% between FY 15 and FY 18.

2 SEGREGATION OF COSTS FOR SECOND CONTROL PERIOD

This chapter discusses the MIAL cost segregation methodology as well as control systems implemented and principles applied in the aggregation of costs, and their segregation for regulatory purposes. The outcome of this study with regard to true-up of costs for the Second Control Period and suggestions for improvements in cost accounting methodology is also discussed.

2.1 Cost collection methodology

The process of aggregation of costs and their allocation into cost centres is discussed below:

i. Existence of Purchase Controls:

A majority of invoices accounted for in SAP are routed through Purchase Orders (PO), except invoices pertaining to the following nature of expenses: -

Table 4: Expense accounting not routed through Purchase order

S No.	Nature expense	Examples	Control mechanism	Maker Checker Workflow
1.	Government/ Statutory Dues	Taxes, Revenue share and other payments to AAI, Airport Operator's Fee	Based on Tax Laws, Valid agreement (OMDA), Approval as per internal DOP matrix	Routed through SAP Workflow of maker and checker
2.	Payments to Banks	Interest, Hedge Cost, other banking Charges	Based on Agreements with Banks, Approval as per internal DOP matrix	Routed through SAP Workflow of maker and checker
3.	Miscellaneous expenses and routine petty expenses	Utility payments, Donations, Group Companies Debit Notes, membership fee and Employee Reimbursements for staff welfare, Travel, local radio taxi	Based on Agreements, Approval as per internal DOP matrix	Routed through SAP Workflow of maker and checker
4.	Other Urgent and One-Time vendors/ Payments	Onetime, urgent and Non-Recurring Expenses	Based on Agreements, Approval as per internal DOP matrix	Routed through SAP Workflow of maker and checker

One-time Vendor Codes: There is one separate vendor code created for one-time vendors used for miscellaneous expenses, usually in these transactions there is no TDS Liability and GST credit.

ii. Cost Centre tagging process at Purchase Order Stage:

The general ledgers are all mapped to Purchase Requisition (PR), which is raised by the concerned User Department, and a Purchase Order (PO) is generated. The PO is released only as per approval levels specified in the Delegation of Powers (DOP) and Standard Operating Procedures (SOP) after due verification

Cost centre allocations are not made at the time of recording a transaction, the expenses are marked to relevant costs centres after year closing based on audited numbers.

iii. Invoice Accounting Process:

The invoice capturing process is manual. The process of matching invoices, verification and processing of invoices is completely driven by SAP workflow and is supported by maker-checker both at Business User level and at the finance department level.

After the supply of goods / service by the vendor, the user department raises a Goods Receipt Note (GRN) / Service Receipt Note (SRN). The invoices received from vendors are forwarded to the respective departments by the vendor help desk. The recipient department then certifies the bill for payment. The certified bill is then forwarded to the accounts department. The certified bill is compared with the Purchase Order (PO) and GRN, checked for certification, verified in terms of compliances, supporting documents and passed for payment.

iv. Purchase Order Amendment Controls:

The SAP-GRC access controls maintained for each T-Code in SAP enables an automatic review of user access and role authorization, and hence, risk of violations are minimised.
Thus, any requirement for PO amendment through T-codes in SAP should go through Procurement department and the assigned approvals.

v. Monitoring open purchase orders:

Open purchase orders are reviewed by procurement team. Any unwanted open purchase orders are closed after seeking clarifications from the user department concerned.

vi. Expense Accruals:

Cost centre tagging for expense accruals is an exercise undertaken as part of the cost accounts preparation process after closure of accounting books for the financial year.

Please refer to section 2.7 of this Report for recommended improvisations to the existing cost collection methodology.

2.2 Expenses segregation principles

The principles determining the segregation of Operation and Maintenance costs in Aeronautical and Non-aeronautical expenses for the purpose of tariff determination is discussed below. The process of segregation broadly involves the following steps:

i) Identification of directly attributable cost to Aeronautical services, Non-aeronautical services and common cost
ii) Segregation of directly attributable cost based on its incurrence
iii) Methodology for allocation of common cost is as below:
   a) Terminal operations common cost is apportioned between Aeronautical & Non-aeronautical activities based on the expense allocation ratio (computed based on directly attributed cost) for the year being computed.
   b) Corporate Overheads are apportioned between Aeronautical & Non-aeronautical activities based on the expense allocation ratio (computed based on directly attributed cost) for the year being computed.

Annual fees, depreciation, interest on term loan, DF collection charges and taxation are not considered as part of Operation and Maintenance cost.

2.3 Segregation principles and methodology applied in the study

2.3.1 Segregation principles

As described in our work steps in **'Term of Reference and Our Work Performed'** section of this Report, we have reviewed the various cost centres and developed a basis for segregation into Aeronautical and Non-aeronautical activities. We have also determined the appropriate proportion of Common Cost Centre that may be included in Aeronautical activity, in order to determine the total Aeronautical cost. Broadly, our principles for segregation of costs (also described as Segregation Logic in this Report) are as follows:

- **Aeronautical Cost**
  - Expense incurred for operation and maintenance of Aeronautical assets.
  - Costs incurred for Aeronautical activities under Schedule 5 of OMDA are segregated as Aeronautical Costs. Examples include Operation support cost, utility expenses, and Airport Operator Agreement fees

- **Non-aeronautical Cost**
  - Expense incurred for operation and maintenance of Non-aeronautical assets.
  - Costs incurred for Non-aeronautical activities covered under Schedule 6 of OMDA are treated as Non-aeronautical expenses. Examples are cargo, ground handling and retail spaces related expenses.

- **Common Cost** includes
  - Costs for which the benefits or use cannot be exclusively linked to either Aeronautical or Non-aeronautical activities are segregated as Common Cost
  - Costs primarily incurred for provision of Aeronautical services but are also used for provision of Non-aeronautical services are segregated as Common Costs. Examples are civil and electrical maintenance costs for Terminal buildings.
  - Costs which are used for general corporate purposes including legal, administration, and management affairs are treated as Common Costs. Examples are transit house and Corporate Headquarters costs

- Common costs are apportioned to Aeronautical activity based on an appropriate cost driver. However, in the absence of any specific information regarding the purpose of incurring the cost, a reasonable ratio[3] is determined based on discussions with management and our review of other records of the Airport.

- **Exclusions –** As per the State Support Agreement between MIAL and Government of India, Annual Fee paid to Airports Authority of India shall not form part of Aeronautical Operation and Maintenance expenses.

2.3.2 Segregation methodology

Our segregation has been carried out based on principles set out in section 2.3.1 above. The segregation principles have been applied using the following methodology:

i. Identification of directly attributable cost to Aeronautical Services, Non-aeronautical services and common cost
ii. Segregation of directly attributable cost based on its incurrence
iii. Methodology for allocation of common cost is as below:
    a) Common costs have been segregated using an appropriate cost driver as described under the respective sections.
    b) In the absence of a more appropriate cost driver, common costs related to Terminal operations are apportioned between Aeronautical and Non-aeronautical activities based on the weighted average terminal floor space ratio, viz., 87.30%.
    c) In the absence of a more appropriate cost driver, corporate overheads are apportioned between Aeronautical and Non-aeronautical activities based on the adjusted gross fixed assets ratio, viz., 82.58% for Aeronautical and 17.42% for Non-Aeronautical (refer Table 67 of this Report).
iv. Annual fees, depreciation, interest on term loan, DF collection charges and taxation are not considered as part of operation and maintenance cost.

[3] Refer to section 2.6 for ratios used in segregation of common costs

2.4 Reconciliation of total costs with audited financials

The table below provides a reconciliation of the expense items as per MYTP submission of Third Control Period with audited financial statements. Although the FY 19 figures of MYTP submission were unaudited, the reconciliation below has considered the audited FY 19 figures which were subsequently available

Table 5: Reconciliation of the MYTP Submission to the Financial Statements

(₹ crores)

Particulars	Ref.	FY 15	FY 16	FY 17	FY 18	FY 19	FY 15-19
Total Expense as per Audited Financial Statement – (A)		**2,871**	**2,877**	**3,291**	**3,492**	**3,716**	**16,247**
Annual fee payable to AAI	a.	(931)	(1,066)	(1,188)	(1,331)	(1,438)	(5,974)
Depreciation	b.	(529)	(507)	(610)	(660)	(722)	(3,028)
Interest on long-term borrowings	c.	(563)	(624)	(708)	(658)	(626)	(3,179)
VRS compensation – payment basis	d.	20	20	19	19	18	96
Employee benefit expenses (IndAS adjustment)	e.	-	-	1.5	(1)	0.1	1
Transaction cost of borrowing (IndAS adjustment)	f.	-	-	(54)	(71)	(61)	(186)
Rounding off		-	-	-	1	-	1
Sub-total – (B)		**(2,003)**	**(2,177)**	**(2,540)**	**(2,701)**	**(2,829)**	**(12,250)**
Total Expense as per MYTP for Control Period II – (A) + (B)		**868**	**700**	**752**	**791**	**887**	**3,998**

a. Annual Fee payable to Airports Authority of India is not a pass-through expenditure. Accordingly, it has been excluded from O&M expenses for the purpose of tariff determination.

b. Depreciation is a separate building block in tariff determination exercise. Accordingly, it has been excluded from the O&M cost purview.

c. Interest on long-term borrowings have been excluded to the extent it has been considered for computation of WACC.

d. VRS compensation is being allowed by AERA on payment basis. However, in the financial statements it has been capitalized as an intangible asset and is being amortized on a systematic basis. The amortized amount has been excluded as part of the depreciation in 'b.' above. Actual amount of VRS compensation paid during the control period has been added to the O&M expenditure.

e. Difference on account of employee benefit expenses and interest cost arising from IndAS compliance were notional entries. Hence, they are kept outside the purview of IndAS.

2.5 Segregation of costs

Based on the outcome of this study, the table below presents the segregation of Operation and Maintenance costs for the Second Control Period into Aeronautical and Non-aeronautical activities along with the principles, basis, and cost drivers applied for each item.

For each expense item, the segregation has been driven first and foremost by its classification as Aeronautical, Non-aeronautical and Common cost as defined in section 2.3.1. For the purpose of segregation of Common cost, in case the expense relates to purpose or location within a terminal building, the expense is segregated into Aeronautical and Non-aeronautical portions in the proportion of the weighted average floor area of the terminals. In case of Common cost outside the terminal building, the expense is segregated into Aeronautical and Non-aeronautical portions in the proportion of the respective adjusted gross fixed assets ratio.

Table 6: General principles for segregation of costs - Details of expenses incurred during FY 15 - FY 19

(₹ crores)

Expense	Aeronautical proportion	Non-aeronautical proportion	Total	Remarks
Employee Cost	782.78	121.96	904.74	• Employee cost of departments engaged in Aeronautical activities have been taken as Aeronautical • Employee cost of departments engaged in Non-aeronautical activities have been taken as Non-aeronautical • Employee cost of common departments have been segregated based on the adjusted gross fixed assets ratio (82.58%, refer Section 2.6 & • Table 67)
Utilities Expenses (Power+ water)	506.94	11.28	518.22	• Utility expenses (net of recovery) have been taken as fully Aeronautical other than expenses attributable to Non-aeronautical activities
Repair & Maintenance Expense	476.35	71.74	548.09	• Segregation has been done on expense by expense basis. • Repairs relating to Aeronautical assets have been classified as Aeronautical and those relating to Non-aeronautical assets classified as Non-aeronautical. • Common expenses other than corporate overheads have been segregated based on the weighted average floor area ratio of the terminals. (87.30%, refer Table 66) • Corporate overheads have been segregated based on adjusted gross fixed assets ratio (82.58%, refer Table 67)

Expense	Aeronautical proportion	Non-aeronautical proportion	Total	Remarks
Rents, Rates & Taxes	167.19	36.85	204.04	• Rent expense has been segregated based on the usage of the premises. • Property tax (net of recovery) has been considered as wholly Aeronautical • Non-Agricultural Tax has been considered as common and segregated using the floor area ratio • Common expenses other than corporate overheads have been segregated based on the weighted average floor area ratio of the terminals. (87.30%, refer Table 66) • Corporate overheads have been segregated based on adjusted gross fixed assets ratio (82.58%, refer • Table 67)
Advertisement Expense	34.73	3.25	37.98	• Promotional expenses relating to company in general has been classified as common expenses/ corporate overheads. E.g. General branding of the airport, printing of diaries vouchers etc., • Promotional expenses relating to Aeronautical marketing have been classified as Aeronautical. • Promotional expenses relating to Non-aeronautical activities/service lines have been classified as Non-aeronautical. • Common expenses other than corporate overheads have been segregated based on the weighted average floor area ratio of the terminals. (87.30%, refer Table 66) • Corporate overheads have been segregated based on adjusted gross fixed assets ratio. (82.58%, refer Table 67)
Administrative Expenses	330.67	96.22	426.89	• Major items in administrative expenses are legal fees, professional fees, corporate support fees, travelling. • Legal expenses have been allocated between Aeronautical and Non-aeronautical categories based on the nature of the underlying cases • Professional fees have been segregated based on the nature of the expense • Common expenses other than corporate overheads other than corporate overheads have been segregated based on the weighted average floor area ratio of the terminals. (87.30%, refer Table 66) • Corporate overheads have been segregated based on adjusted gross fixed assets ratio. (82.58%, refer • Table 67)
AOA Fees	36.62	7.72	44.34	• Airport Operator Agreement (AOA) fee has been segregated based on adjusted gross fixed assets ratio (82.58%, refer • Table 67)
Insurance Expense	18.82	3.97	22.79	• Insurance expenses have been segregated based on adjusted gross fixed assets ratio (82.58%, refer • Table 67)

Expense	Aeronautical proportion	Non-aeronautical proportion	Total	Remarks
Consumable stores	30.75	2.06	32.81	• Consumables have been classified by MIAL based on their usage. Consumables used at the corporate office have been classified as corporate overheads.
Operating cost	565.83	54.64	620.47	• Operating expenses include cleaning, security, horticulture, trolley, medical emergencies etc., • Cleaning and trolley contracts are classified as fully Aeronautical. • Security is classified as Aeronautical except when deployed for wholly Non-aeronautical activities • Horticulture is considered Aeronautical except when relating to wholly Non-aeronautical activities • Common expenses other than corporate overheads other than corporate overheads have been segregated based on the weighted average floor area ratio of the terminals. (87.30%, refer Table 66) • Corporate overheads have been segregated based on adjusted gross fixed assets ratio. (82.58%, refer • Table 67)
Provision for Bad Debts	-	-	2.60	• Provision for bad debts has not been considered as an expense as it is a notional item
Bad debts written off	0.05	6.87	6.92	• Bad debts have been classified based on the nature of debt written off. Aeronautical dues written off have been classified as Aeronautical and Non-aeronautical dues written off have been classified as Non-aeronautical
Working Capital Interest	58.98	12.44	71.42	• Working capital interest has been considered as a corporate overhead and has been segregated using the adjusted gross fixed assets ratio. (82.58%, refer • Table 67)
Financing charges	100.52	27.89	128.41	• Commission for bank guarantee has been segregated based on the use of guarantee • Finance charges specifically identified as Non-aeronautical has been accordingly classified e.g. interest on delayed payment of annual fees • Other finance charges have been classified as corporate overhead as they were incurred for procurement of long-term finance. Segregated based on adjusted gross fixed assets ratio. (82.58%, refer • Table 67)
VRS	82.87	13.27	96.14	• VRS expenses have been segregated based on HR cost Ratio (Refer Table 10)
Loss on scrapping of Asset	244.58	3.77	248.35	• Loss on scrapping of asset has been classified based on the classification of the asset scrapped. • Loss on scrapping of modifications/refurbishments to old Terminal 2 building and assets located within has been classified based on extent of utilization of the demolished space for Aeronautical activity

Expense	Aeronautical proportion	Non-aeronautical proportion	Total	Remarks
Collection charges of DF	-	-	33.14	• Development Fee (DF) collection charges have not been considered as part of O&M expenditure
PSF Disallowance	23.33	-	23.33	• Passenger Security Fee (PSF) disallowance borne by MIAL has been classified as wholly Aeronautical
CSR cost	-	-	4.16	• CSR has been considered as an inadmissible expense and kept outside the purview of segregation (Please refer note 2 to this table)
Exchange gain and loss	7.43	1.57	9.00	*Exchange gain / loss is considered as a corporate overhead and is segregated based on the adjusted gross fixed assets ratio (82.58%, refer* • Table 67).
CWIP - Written off	-	-	13.54	• CWIP written off has been excluded from the scope of O&M expenses for segregation as it does not relate to operations or maintenance
Investment written off	-	-	0.03	• Investment written off is an unrealized expense and does not relate to operation and maintenance of CSMIA. Hence excluded from the purview of segregation.
Total	**3468.43**	**475.51**	**3,997.41**	Provision for Bad debts (₹ 2.60 crore), Collection charges of DF (₹ 33.14 crores), CWIP written off (₹ 13.54 crore), Investment written off (₹ 0.03 crores) , CSR Expense (₹ 4.16 crores) ₹ 53.47 crore has been kept outside the purview of segregation due to reasons cited in respective heads above.

(₹ crores)

Total Operational and Maintenance expenses (FY 15- FY19)	**3997.41**
Less: Inadmissible Expense	(53.47)
Net Expense	***3,943.94***
(i)Aero Expense	3,468.43
(ii) Non-Aero Expense	**475.51**
Total Aero + Non-Aero Expense (i) + (ii)	***3,943.94***

Notes:

1. The floor area ratio used for the purpose of segregation has been computed based on the report of consultants appointed by MIAL who had surveyed the airport at the close of FY 19. Please refer to Table 66 for computation details.

2. The Authority feels that CSR expense should be borne by the Airport Operator out of their surplus and in no case can be treated as a pass through expenditure since the same cannot be loaded on to passengers and or airlines.

3. The gross fixed assets ratio used for segregation of corporate overheads have been computed applying the actual floor area reported by consultants as noted in (1) on the common assets of the airport as at 31st March 2019. Accordingly, the gross fixed assets ratio / gross Aeronautical assets ratio used in this report is after considering the adjustment proposed by us in our report issued under RFP 03/2018-19. *Refer*
4. *Table* 67 *for computation of Gross Fixed Assets ratio.*

2.5.1 Human resource cost

Description of Expense:

2.5.1.1 Cost of human resources include salaries, wages, social security benefits, bonus, perquisites (such as medical reimbursement), gratuity paid to employees etc. Fees paid to retainers is also classified under this category for the purposes of operation and maintenance cost determination.

MIAL's Segregation Logic:

2.5.1.2 MIAL has segregated the Human Resource cost based on the employee headcount between Aeronautical and Non-aeronautical departments. Each department is categorized as Aeronautical / Non-aeronautical and the Aeronautical expense ratio is arrived at by dividing the total headcount of Aeronautical departments by the total headcount of all the employees.

2.5.1.3 Ratio computed using logic in section 2.5.1.2 above has been used for segregation of fees paid to retainers also.

Table 7: Segregation ratio of Human Resource Cost based on Headcount

	FY 15	FY 16	FY 17	FY 18	FY 19
Aeronautical Headcount	1,352	1,272	1,238	1,152	1,168
Non-aeronautical Headcount	76	83	77	67	54
Total Headcount	**1,428**	**1,355**	**1,315**	**1,219**	**1,222**
Aeronautical % used by MIAL	94.68%	93.87%	94.14%	94.50%	95.58%

Outcome of this study:

2.5.1.4 Average salary per employee is not at comparable levels between the departments. This could be because some departments may engage highly skilled personnel at higher remuneration depending on nature of job responsibilities/ assignment. Segregation based on the headcount would not take into consideration this factor. A distortion could be created in the Aeronautical expense ratio on account of this.

2.5.1.5 Further on examining the classification of the departments into Aeronautical and Non-aeronautical as provided by MIAL, we noticed that certain departments such as Finance and Accounts , CEO's office, corporate communications etc., were classified as wholly Aeronautical whereas these departments exist to support both Aeronautical and Non-aeronautical activities. The list of departments reclassified by us as common is given below:

- Director's Office
- Facilities
- Compliance & Assurance
- Information Technology
- Chairman's Office

- MD's Office
- Chief Executive Officer's Office
- Management Assurance
- Finance & Accounts
- Human Resources
- Administration
- Corporate Relations
- Guest Relations
- Corporate Affairs
- Special Projects
- Legal
- Corporate Communications
- Airport Operation Readiness
- Urban Planning
- Land Management
- Project Execution

2.5.1.6 The existing segregation logic is flawed on the grounds mentioned in sections 2.5.1.4 and 2.5.1.5 above. Accordingly, in our opinion the correct logic to be used for segregation of man-power expenses is *department wise actual gross cost to company*.

2.5.1.7 Employee cost of common departments have been classified into Aeronautical and Non-aeronautical based on the gross Aeronautical fixed assets ratio as at the end of Second Control Period (31st March 2019) after the adjustment of reclassification items identified in our report submitted against RFP 03/2018-19.

2.5.1.8 Segregation of certain items of remuneration such as leave salary, gratuity contributions, ex-gratia, uniform & liveries, medical reimbursement, medical insurance, training and talent management, welfare expenses, recruitment expenses, administrative support staff cost have been carried out based on the ratio as computed using the department wise CTC information.

2.5.1.9 Fees paid to retainers has been segregated based on classification of the department in which they are deployed. Cost of retainers deployed at common departments has been segregated based on the adjusted gross fixed assets ratio (as arrived in the RPF 03/2018-19 – Allocation of assets report)

Impact of the change in the segregation logic as above has been tabulated in *Table* 8 for employees on roll of MIAL and in *Table 9* for retainers.

Table 8: Revision in segregation logic of Employees Cost (Salaries, perquisites and social security for on-roll employees)

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	135.94	147.67	183.92	185.77	196.42	**849.72**
Aeronautical Ratio MIAL%	94.68%	93.87%	94.14%	94.50%	95.58%	
Aeronautical Employee Cost as per MIAL	128.81	138.61	173.14	175.55	187.74	**803.85**
Revised Segregation Ratio%	84.73%	83.82%	86.12%	87.51%	89.30%	
Impact of revision in segregation logic	(13.52)	(14.83)	(14.76)	(12.99)	(12.34)	**(68.45)**

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Aeronautical Employee Cost based on revised logic	115.29	123.78	158.38	162.56	175.40	**735.32**

Table 9: Revision in segregation logic of Retainer Fee (Compensation paid to contracted retainers)

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	10.12	13.60	12.79	12.16	6.16	54.83
Aeronautical Ratio MIAL%	94.68%	93.87%	94.14%	94.50%	95.58%	
Aeronautical retainer fee Cost as per MIAL	9.58	12.77	12.04	11.49	5.88	51.76
Revised Segregation Ratio%	84.43%	85.30%	85.32%	88.49%	88.37%	
Impact of revision in segregation logic	(1.04)	(1.17)	(1.13)	(0.73)	(0.44)	(4.51)
Aeronautical retainer fee based on revised logic	8.54	11.60	10.91	10.76	5.44	47.26

Table 10: Impact of revision in segregation logic on total human resource cost (Compensation for on-roll employees and retainers)

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total Human resource cost	146.06	161.28	196.71	197.93	202.58	904.56
Aeronautical human resource cost as per MIAL	138.29	151.40	185.18	187.07	193.80	855.74
Aeronautical Ratio MIAL%	94.68%	93.87%	94.14%	94.50%	95.58%	
Revised Segregation Ratio%	84.71%	83.95%	86.06%	87.57%	89.27%	
Impact of revision in segregation logic	(14.56)	(16.00)	(15.89)	(13.72)	(12.79)	(72.95)
Aeronautical Human resource cost based on revised logic	123.73	135.40	169.29	173.35	181.01	782.78

2.5.2 Utility cost

Description of Expense:

2.5.2.1 Electricity expense includes electricity charges, water charges and piped natural gas. Electricity is mainly consumed for lighting, HVAC and equipment used for running the regular Aeronautical activities as also for lighting and equipment used by the concessionaires such as retail shops, food

and beverage stores, cargo, airline offices etc. Electricity, water and gas consumed by the concessionaire is charged from them and reduced from the gross consumption charges.

MIAL's Segregation Logic:

2.5.2.2 MIAL is treating the cost of power consumed (net of recoveries) as fully Aeronautical expenditure irrespective of the quantity for which the recovery was made.

Table 11: Gross Cost of Power Consumption at various locations as per MIAL

(₹ crores)

Cost	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Gross cost of electricity consumed	138.50	151.29	150.87	173.67	168.77	783.10
Less: Recovery from concessionaires	(44.00)	(55.59)	(60.25)	(68.66)	(68.52)	(362.36)
Net cost of electricity consumed – Fully Aeronautical	94.50	95.70	90.62	105.01	100.25	486.08

Outcome of this study:

Table 12: Impact change in the segregation logic for electricity cost

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total expense	103.82	98.63	93.48	112.67	109.61	518.21
AERONAUTICAL MIAL %	100%	100%	100%	100%	100%	
AERONAUTICAL MIAL	103.82	98.63	93.48	112.67	109.61	518.21
Adjustment						
Power cost	(1.59)	(0.73)	(1.70)	(4.21)	(3.04)	(11.27)
AERONAUTICAL after adjustments	102.23	97.90	91.78	108.46	106.57	506.94
Ratio	98.47%	99.26%	98.18%	96.26%	97.23%	

2.5.2.3 On examination of quantitative details produced to us regarding power consumption, we observed that the entire quantum of electricity consumed for Non-aeronautical activities was not recovered. Accordingly, the unrecovered quantity of electricity consumed towards Non-aeronautical activities have to be reclassified as Non-aeronautical.

Table 13: Quantitative Details of Gross Electricity Consumption as per MIAL

Particulars	2014-15 Units kwH (in crore)	2015-16 Units kwH (in crore)	2016-17 Units kwH (in crore)	2017-18 Units kwH (in crore)	2018-19 Units kwH (in crore)
New T2	8.83	9.44	10.98	11.15	11.25
T1	3.62	4.01	3.39	3.46	3.57
Cargo	1.00	0.97	0.92	1.17	1.24
AI-IOCL/STP 4MLD / CCR / CA/ Apron/Corporate Point/Others	0.59	0.67	0.62	0.64	0.25
Shivaji Smarak/Elevated Road/MLCP/STP 10MLD	0.50	0.56	0.75	0.68	0.09
Total	14.54	15.65	16.66	17.1	16.4

Table 14: Quantitative details of recoveries from Non-aeronautical Activities as per MIAL

Particulars	2014-15 Units kwH (in crore)	2015-16 Units kwH (in crore)	2016-17 Units kwH (in crore)	2017-18 Units kwH (in crore)	2018-19 Units kwH (in crore)
New T2	0.7	1.01	1.49	2.35	2.54
T1	0.97	1.16	1.20	1.22	1.30
Cargo	0.88	0.86	0.81	0.83	0.93
AI-IOCL/STP 4MLD / CCR / CA/ Apron/Corporate Point/Others	0.22	0.24	0.26	0.28	0.26
Shivaji Smarak/Elevated Road/MLCP/STP 10MLD	-	-	-	-	-
Total	2.77	3.27	3.76	4.68	5.03

Table 15: Quantitative Details of Net Electricity Consumption as per MIAL

S. No	Particulars	2014-15 Units kwH (in crore)	2015-16 Units kwH (in crore)	2016-17 Units kwH (in crore)	2017-18 Units kwH (in crore)	2018-19 Units kwH (in crore)
1.	New T2	8.13	8.43	9.49	8.80	8.70
2.	T1	2.65	2.85	2.19	2.24	2.27
3.	Cargo	0.12	0.11	0.11	0.34	0.31
4.	AI-IOCL/STP 4MLD / CCR / CA/ Apron/Corporate Point/Others	0.37	0.43	0.36	0.36	-

5.	Shivaji Smarak/Elevated Road/MLCP/STP 10MLD	0.50	0.56	0.75	0.68	0.09
	Total	11.77	12.38	12.9	12.42	11.37

2.5.2.4 As shown in *Table 15* above, electricity consumed at locations in # 3, 4 and 5 of the above table are not fully recovered, consequently cost attributable to them has to be reclassified as Non-aeronautical.

2.5.2.5 Cargo in # 3 of the table above is fully Non-aeronautical whereas the activities / department mentioned in # 4 and #5 contain both Aeronautical and Non-aeronautical in composition. Accordingly, electricity consumed by them has been treated as common and segregation has been carried out based on overall floor area due to non-availability of further data.

Table 16: Computation of Non-aeronautical component in Utility Cost

(₹ crores)

S. No	Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
1.	Electricity Cost ₹ (net of recoveries)	94.50	95.70	90.62	105.01	100.25
2.	Net consumption – kWh (net of recoveries) towards Non-aeronautical and common activities					
2a.	Total including Aeronautical activities – kWh	11.77	12.39	12.90	12.44	11.37
2b.	Cargo – kWh	0.12	0.11	0.11	0.34	0.31
2c.	AI-IOCL/STP 4MLD / CCR / CA/ Apron/Corporate Point/Others – kWh	0.37	0.43	0.36	0.36	-0.00
2d.	Shivaji Smarak/Elevated Road/MLCP/STP 10MLD kWh	0.50	0.56	0.75	0.68	0.09
3.	Electricity cost apportioned to Cargo [(1) / (2a)] * (2b) ₹	0.97	0.84	0.77	2.86	2.73
4.	Non-aeronautical floor space ratio considering t1 & t2	12.70%	12.70%	12.70%	12.70%	12.70%
5.	Electricity cost apportioned to location in 2c & 2d ₹ [(1)/(2a)] * [(2c) + (2d)] * (4)	0.89	0.98	0.99	1.12	0.10
6.	Cost of Piped Natural Gas (net of recoveries)	(0.27)	(1.09)	(0.06)	0.22	0.21
7.	Total Non-aeronautical portion in utilities* Cost ₹ (3) + (5) + (6)	**1.59**	**0.73**	**1.70**	**4.21**	**3.04**
8.	Total Cost of Utilities (net of recoveries)	103.82	98.63	93.48	112.67	109.61
9.	Aeronautical Portion in total utilities cost {100 – [(7) / (8)]} * 1 / 100	98.47%	99.26%	98.18%	96.26%	97.23%

*Total Non-aeronautical portion of utilities cost is **₹11.27 crores.**

2.5.3 Repairs and maintenance expenses

Description of the Expense:

2.5.3.1 Repairs and maintenance include sums incurred towards repairs and maintenance (including annual maintenance contracts) in nature of

i) civil works at passenger / cargo terminals, landside and airside areas
ii) electrical repairs and maintenance for airside ground lighting, aerobridges (and related electrical installations), air conditioning equipment, power supply and generation sets
iii) repairs and maintenance of plant and machinery such as baggage handling equipment, security equipment etc.,
iv) repairs and maintenance of certain information technology assets and electronics
v) repairs and maintenance of vehicles, furniture and fixtures

MIAL's Segregation Logic:

2.5.3.2 MIAL has segregated repairs and maintenance expenses based on the nature of individual expense line items. Repairs and maintenance expense incurred towards maintenance of airside assets, security related assets and such other assets that are used for carrying out Aeronautical activities as listed in schedule 5 of OMDA have been classified as Aeronautical, whereas those incurred on Non-aeronautical assets have been classified as Non-aeronautical. Expenses not wholly identifiable as Aeronautical or Non-aeronautical has been classified as common. Segregation of common expenses have been carried out using the expense ratio as narrated in section 2.6.2.

Outcome of this study:

Table 17: Impact of revised segregation logic - Repairs and Maintenance

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	109.78	78.25	101.58	111.22	147.26	548.09	
AERONAUTICAL MIAL %	82%	95%	92%	98%	90%		
AERONAUTICAL MIAL	90.28	74.01	93.44	108.82	133.07	510.63	
Adjustment							
Repairs and Maintenance Power	(0.02)	(0.01)	(0.11)	(0.25)	(0.19)	(0.58)	2.5.3.3
SAP Related Expenses	(0.11)	(0.12)	(0.12)	(0.16)	(0.15)	(0.66)	2.5.3.4
TMRS Frequency Allotment Charges	(0.09)	(0.09)	(0.10)	(0.15)	(0.10)	(0.53)	2.5.3.5
Terminal Related Civil Work	(1.52)	(1.16)	(1.57)	(2.11)	(2.66)	(9.02)	2.5.3.6
Cargo Related Civil Maintenance classified as common	(11.56)	-	-	-	-	(11.56)	2.5.3.7
Common expenses	(0.15)	(0.17)	(0.11)	(0.09)	(0.09)	(0.61)	2.5.3.8
Corporate Overhead	(0.01)	(0.02)	(0.01)	(0.26)	(0.01)	(0.31)	2.5.3.8
Total Adjustments	(13.46)	(1.57)	(2.02)	(3.02)	(3.20)	**(23.28)**	
Aeronautical after adjustments	76.82	72.44	91.42	105.80	129.87	476.35	
Ratio	69.98%	92.58%	90.00%	95.13%	88.19%		

2.5.3.3 Repairs and maintenance incurred and allocated to 'power' cost centre have been wholly classified as Aeronautical. We have suggested to classify the repairs and maintenance relating to power in the ratio of segregation of power cost:

Table 18: Segregation of Repairs and Maintenance relating to power cost centre

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Repairs and maintenance allocated to Power cost centre	1.14	1.13	6.00	6.80	6.80	21.87
Aeronautical ratio of MIAL	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio	98.47%	99.26%	98.18%	96.26%	97.23%	
Impact of reclassification	(0.02)	(0.01)	(0.11)	(0.25)	(0.19)	(0.58)

2.5.3.4 MIAL uses SAP as its ERP software. Usage of SAP is primary for the purpose of accounting the financial and certain non-financial transactions of MIAL. It is therefore appropriate to classify all SAP related expenses as corporate overheads. Corporate overheads have been classified based on the gross Aeronautical fixed asset ratio as 31st March 2019 as narrated in section 2.6.8 .

Table 19: Reclassification of SAP related expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
SAP related expenses	0.63	0.69	0.69	0.92	0.85	3.78
Aeronautical Ratio of MIAL%	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of reclassification	(0.11)	(0.12)	(0.12)	(0.16)	(0.15)	(0.66)

2.5.3.5 MIAL is paying the Department of Telecommunication an annual fee towards allotment of frequencies for operation of Trunk Mobile Radio System (TMRS). We understand from MIAL that out of 1100 connections 110 connections have been provided to concessionaires who are ground handling agents and airlines. Accordingly, the cost of annual fee for frequency allocation has to be apportioned based on the number of connections actually used by MIAL.

Table 20: Revised Segregation Logic for TMRS Frequency Fee

(₹ crores) unless otherwise specified

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Annual Frequency allotment charges	0.89	0.91	1.03	1.54	1.04	5.41
Aeronautical Ratio of MIAL%	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio%	90%	90%	90%	90%	90%	
Impact of reclassification	(0.09)	(0.09)	(0.10)	(0.15)	(0.10)	(0.53)

2.5.3.6 Repairs and maintenance to terminal building has been classified as wholly Aeronautical (identified as expenses allocated to the 'Aeronautical common' cost centre) in nature by MIAL. Terminal building is used for both Aeronautical and Non-aeronautical activities, accordingly the cost of the terminal's structure has been classified as common and segregation is carried out based on the floor area. Applying the same logic, the cost of repair / maintenance / civil work revenue in nature have been considered as common and segregated based on the floor area. As terminal specific allocation for costs was not made by MIAL, weighted average floor area ratio based on total area of both the terminals has been used.

Table 21: Reclassification of Terminal building civil work

(₹ crores)

Particulars	**FY 15**	**FY 16**	**FY 17**	**FY 18**	**FY 19**	Total
Terminal related civil work Classified as Aeronautical	11.98	9.12	12.38	16.65	20.94	71.07
Aeronautical Ratio of MIAL	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of reclassification	(1.52)	(1.16)	(1.57)	(2.11)	(2.66)	(9.02)

2.5.3.7 Further on examination of the classification of major items in repairs and maintenance – civil, we noticed that in the year 2014-15 expenditure incurred towards civil maintenance work at cargo terminal was classified as a common expenditure. The item has been regrouped as Non-aeronautical as shown in Table 22:

Table 22: Cargo terminal related civil maintenance work reclassified as Non-aeronautical

(₹ crores)

Particulars	2014-15
Terminal related civil work Classified as Aeronautical	12.95
Aeronautical Ratio of MIAL	89.29%
Revised Aeronautical Ratio	0%
Impact of reclassification	(11.56)

2.5.3.8 We have used the 'weighted average terminal floor area ratio' of the airport for segregation of expenses allocated to 'airport common cost centre' and 'gross fixed assets ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'corporate overheads' cost centre. The rationale for changes relating to the corporate overhead / airport common cost centre has been discussed in section 2.6. Table 23 shows in the impact on account of change in the ratio of airport common cost centre and Table 24 shows the impact of change in the ratio of corporate overheads cost center.

Table 23: Impact of change in the ratio of 'airport common' cost centre – Repairs and Maintenance Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Airport Common*	7.55	2.85	3.06	1.78	1.78	29.97
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	(0.15)	(0.17)	(0.11)	(0.09)	(0.09)	(0.61)

*Amount is after deducting items removed from this cost centre

Table 24: Impact of change in the ratio corporate overheads cost centre – Repairs and Maintenance Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Corporate Overheads*	0.14	0.16	0.17	2.64	0.09	3.21
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.01)	(0.02)	(0.01)	(0.26)	(0.01)	(0.31)

*Amount is after deducting items removed from this cost centre

2.5.4 Rent, rates and taxes

Description of the Expense:

2.5.4.1 Major expense items in rent, rates and taxes include rental paid for accommodating customs offices, guest house rentals, property taxes, Non-Agricultural tax and other levies of similar nature.

MIAL's existing segregation logic:

2.5.4.2 MIAL has segregated rent, rates and taxes based on the nature of individual expense line items by applying the principles in section 2.2 of this report. Rental expense incurred towards customs office rentals have been classified as Aeronautical. Guest house rentals have been classified as corporate overheads. Property taxes have been fully classified as Aeronautical after adjustment of recoveries from concessionaires. Non-agricultural tax was wholly classified as Aeronautical.

Outcome of this study:

Table 25: Impact of revision in segregation logic - Rent, rates and taxes

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Ref.
Total expense	28.26	5.00	32.03	50.07	88.68	204.04	
AERONAUTICAL MIAL %	91%	91%	91%	91%	91%		
AERONAUTICAL MIAL	25.60	4.53	28.99	45.31	80.25	184.68	
Adjustment							
Non-Agricultural Tax	(0.72)	(0.74)	(0.73)	(2.27)	(9.54)	(14.01)	2.5.4.3
Pollution Control Concession Fee	(0.18)	-	-	-	-	(0.18)	2.5.4.4
Common Expenses	(0.10)	(0.22)	(0.34)	(0.54)	(0.67)	(1.87)	2.5.4.5
Corporate Overhead	(0.31)	(0.27)	(0.24)	(0.31)	(0.31)	(1.44)	2.5.4.5
Total Adjustments	(1.31)	(1.23)	(1.31)	(3.12)	(10.52)	**(17.48)**	
AERONAUTICAL after adjustments	24.29	3.30	27.68	42.19	69.73	167.19	
Ratio	85.92%	65.91%	86.42%	84.28%	78.63%		

2.5.4.3 MIAL has wholly grouped non-agricultural tax as Aeronautical. Non-agricultural tax is levied under Maharashtra Land Revenue Code, 1966 in respect of areas recognized as agricultural zones and where non-farming activity is being carried out. No recovery is made from the concessionaires in respect of non-agricultural tax. The basis on which this tax is being levied was not readily available. However, it is not inappropriate to attribute some part of this tax to Non-aeronautical activities inside the airport. Accordingly, we have reclassified this expense as common based on the overall floor area of the airport. Further we suggest that MIAL considers implementation of a mechanism for recovery of this amount from the concessionaires and segregate portions attributable to Aeronautical activities based on the charging mechanism used by the government. Impact of reclassification of this amount has been tabulated in Table 26 below:

Table 26: Impact of change in segregation logic for NA tax

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Non-agricultural tax expense	5.72	5.83	5.74	17.86	75.12	110.27
Aeronautical Ratio – MIAL%	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio %	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of reclassification	(0.73)	(0.74)	(0.73)	(2.27)	(9.54)	(14.01)

2.5.4.4 An annual fee is paid to the pollution control board towards renewal of consent for operation of the airport. This expenditure is common in nature and has been classified as common for all years in the Second Control Period except 2014-15. Therefore, expense incurred during the year 2014-15 has been reclassified as common as shown in Table 27.

Table 27: Reclassification of Pollution Control Board Consent Fee for the year 2014-15

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Pollution consent renewal	1.42	-	-	-	-	1.42
Aeronautical Ratio MIAL %	100%	100%	100%	100%	100%	
Revised Aeronautical %	86.36%	86.36%	86.36%	86.36%	86.36%	
Impact of reclassification	(0.19)	-	-	-	-	(0.19)

2.5.4.5 We have used the 'Weighted Average Terminal Area Ratio of the airport for segregation of expenses allocated to 'Airport Common cost centre' and 'Gross Fixed Assets Ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'Corporate Overheads' cost centre. The rationale for changes relating to the corporate overhead / airport common cost centre has been discussed in section 2.6. *Table 28* shows in the impact on account of change in the ratio of Airport Common cost centre and *Table 29* show the impact of change in the ratio of Corporate Overheads cost centre.

Table 28: Impact of change in the ratio of 'airport common' cost centre - Rent, rates and taxes

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Airport Common*	5.23	3.74	9.51	10.72	13.36	42.56
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	(0.10)	(0.22)	(0.34)	(0.54)	(0.67)	(1.87)

*Amount is after deducting items removed from this cost centre

Table 29: Impact of change in the ratio of 'corporate overhead' cost centre – Rent, rates and taxes

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Corporate Overheads*	4.57	2.53	2.86	3.11	3.09	16.16
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.31)	(0.27)	(0.24)	(0.31)	(0.31)	(1.44)

*Amount is after deducting items removed from this cost centre

2.5.5 Advertisement expenses

Description of the Expense:

2.5.5.1 Advertisement expenses include expenses incurred towards general advertisement, event organized for promotion / brand building, retention of a PR agency and surveys relating to customer satisfaction.

MIAL's segregation logic:

2.5.5.2 MIAL has segregated advertisement expenses based on the nature of individual expense line items by applying the principles in section 2.2 of this Report. Expenses common to Aeronautical and Non-aeronautical activities that have been allocated to the common cost centres 'Airport Common' and 'Corporate Overheads' has been segregated based on the expense ratio (as before allocation of common costs).

Outcome of this study:

Table 30: Impact of change common expenses segregation logic - Advertisement Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total expense	5.75	7.11	8.63	8.07	8.41	37.97
AERONAUTICAL MIAL %	99%	97%	94%	94%	94%	
AERONAUTICAL MIAL	5.68	6.92	8.10	7.59	7.91	36.20
Adjustment						
Corporate Overhead	(0.09)	(0.30)	(0.23)	(0.46)	(0.23)	(1.31)
Common Expenses	(0.01)	(0.11)	(0.03)	(0.01)	-	(0.16)
Total Adjustments	(0.10)	(0.41)	(0.26)	(0.47)	(0.23)	(1.47)
Aeronautical after adjustments	5.58	6.51	7.84	7.12	7.68	34.73
Ratio	96.97%	91.52%	90.87%	88.34%	91.27%	

2.5.5.3 We have used the 'Weighted Average Floor Area Ratio' of the airport for segregation of expenses allocated to 'Airport Common Cost Centre' and 'Adjusted Gross Fixed Assets Ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'Corporate Overheads' cost centre. The rationale for changes relating to the Corporate Overhead / Airport Common Cost Centre has been discussed in para 2.6.

2.5.5.4 Table 31 shows the impact on account of change in the ratio of Airport Common Cost Centre and Table 32 show the impact of change in the ratio of Corporate Overheads cost centre.

Table 31: Impact of change in the ratio of 'airport common' cost centre – Advertisement Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Airport Common costs*	0.60	1.77	0.77	0.19	-	3.33
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	(0.01)	(0.11)	(0.03)	(0.01)	-	(0.19)

*Amount after deducting items reclassified to wholly Aeronautical and wholly Non-aeronautical

Table 32: Impact of change in the ratio of 'Corporate Overhead' cost centre – Advertisement Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Corporate Overheads*	1.38	2.78	2.76	4.64	2.30	13.86
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.09)	(0.30)	(0.23)	(0.45)	(0.22)	(1.29)

*Amount after deducting items reclassified to wholly Aeronautical and wholly Non-aeronautical

2.5.6 Administrative expenses

Description of Expense:

2.5.6.1 Major items in administrative expenses include legal fees, professional fees, corporate support fees, travelling and lodging, telephone expenses, business development, conveyance, printing & stationery, subscription / membership fees and hospitality expenses.

MIAL's segregation logic:

2.5.6.2 MIAL has segregated advertisement expenses based on the nature of individual expense line items by applying the principles in section 2.2 of this Report. Expenses common to Aeronautical and Non-aeronautical activities that have been allocated to the common cost centres 'Airport Common' and 'Corporate Overheads' has been segregated based on the expense ratio (as before allocation of common costs).

Outcome of this study:

Table 33: Impact of revised segregation logic - Administrative Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Para Reference
Total expense	58.48	105.75	88.49	78.88	95.29	426.89	
Aeronautical							
% of total expense	*89%*	*93%*	*89%*	*91%*	*88%*		
Amount	51.81	98.02	78.34	71.49	84.10	383.76	
Adjustment							
Legal Fees	(1.08)	(3.59)	(1.46)	(1.71)	(1.22)	(9.06)	2.5.6.3
Professional Fees	(1.24)	(12.93)	-	(2.46)	(3.59)	(20.22)	2.5.6.4
Chartered Flight Trips	[NA]	[NA]	[NA]	(4.28)	(1.67)	(5.95)	2.5.6.5
Common Cost Centre	(0.39)	(1.74)	(1.01)	(1.39)	(1.44)	(5.97)	2.5.6.6
Corporate Overhead	(0.76)	(4.90)	(1.72)	(1.86)	(2.65)	(11.89)	2.5.6.6
Total Adjustments	**(3.47)**	**(23.16)**	**(4.19)**	**(11.70)**	**(10.57)**	**(53.09)**	
Aeronautical Administrative Expenses (post-adjustments)	48.34	74.86	74.15	59.79	73.53	330.67	
% of total expense	*82.66%*	*70.79%*	*83.79%*	*75.80%*	*77.16%*	*77.46%*	

2.5.6.3 Legal fees have been classified as corporate overhead by MIAL and is being segregated using the expense ratio (please refer to section 2.6.2 for description of this ratio). In line with AERA's expectations in paragraph 6.92 of Tariff Order No. 13 / 2016-17 / MIAL, we have revised the segregation methodology of this expense based on the nature of the underlying litigation. The revised segregation is based on the inputs regarding the suits as provided by MIAL. Please refer to *Table 40* for impact of this reclassification.

Table 34: Impact of reclassification of lawyer's fees / legal costs

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Legal/lawyer's Fees	15.96	22.67	20.03	15.57	21.27	95.50
Aeronautical Ratio used by MIAL %	89.29%	93.28%	90.91%	92.32%	92.32%	
Aeronautical Expense	14.25	21.15	18.21	14.37	19.64	87.62
Revised Ratio %	82.42%	77.37%	83.51%	81.26%	86.53%	
Impact of revision	(1.08)	(3.59)	(1.46)	(1.71)	(1.22)	(9.07)

2.5.6.4 On examination of the major items in professional fees ledger, it was noted that expenses incurred towards bidding and other expenses for Navi Mumbai International airport were classified as

Aeronautical. In our opinion, expenses incurred for bid preparation and consulting towards Navi Mumbai International Airport project cannot be claimed as Aeronautical as the same is not relevant to the operations carried out at CSMIA. Accordingly, the same has been classified as Non-aeronautical as shown in *Table 35* below:

Table 35: Reclassification of Professional Fees incurred towards Navi Mumbai Airport

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Navi Mumbai related expense	1.24	12.93	-	2.46	3.89	20.52
Aeronautical Ratio MIAL %	100%	100%	100%	100%	*92.32%	
Impact of reclassification	(1.24)	(12.93)	-	(2.46)	(3.59)	(20.22)

*Expenses incurred during the year 2018-19 was classified as common hence only the portion that was Aeronautical has been reclassified

2.5.6.5 Chartered flights are used by the top management executives and promotors of the company. MIAL has allocated the cost of chartered flight trips to airport common cost centre and segregated the same in the ratio of directly allocated expenses (please refer to paragraph 2.6.2 for description of this ratio). We have revised the ratio of segregation as 50% Aeronautical as shown in *Table 36* below:

Table 36: Revision of segregation ratio for cost of chartered flight trips

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Chartered Flight cost	[NA]*	[NA]*	[NA]*	10.12	3.95	14.07
Aeronautical Ratio MIAL%	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	50%	50%	50%	50%	50%	
Impact of reclassification	[NA]*	[NA]*	[NA]*	(4.28)	(1.67)	(5.95)

*Amounts have not been quantified as the information was not available

2.5.6.6 We have used the 'weighted average terminal floor area ratio' of the airport for segregation of expenses allocated to 'airport common cost centre' and 'gross fixed assets ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'corporate overheads' cost centre. The rationale for changes relating to the corporate overhead / airport common cost centre has been discussed in section 2.6. *Table 37* shows in the impact on account of change in the ratio of 'Airport Common' cost centre and *Table 38* shows the impact of change in the ratio of 'Corporate Overheads' cost centre.

Table 37: Impact of change in the ratio of 'Airport Common' cost centre – Administrative Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Airport Common costs*	19.58	29.13	27.93	27.63	28.69	132.96
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	(0.39)	(1.74)	(1.01)	(1.39)	(1.44)	(5.97)

*Amount is after deducting items removed from this cost centre

Table 38: Impact of change in the ratio of 'Corporate Overhead' cost centre – Administrative Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Corporate Overheads*	11.27	45.78	20.70	19.11	27.18	124.04
Aeronautical Ratio % - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised Ratio%	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.76)	(4.90)	(1.72)	(1.86)	(2.65)	(11.89)

*Amount is after deducting items removed from this cost centre

2.5.7 Airport operation assistance fees

2.5.7.1 In line with the OMDA requirements, MIAL entered into an airport operator agreement with ACSA Global Limited on 28.04.2006 for availing their expertise in airport operations.

2.5.7.2 Schedule 8 of OMDA lays down the principles of Airport Operator Agreement which includes the principles of financial remuneration. The relevant section of the schedule has been reproduced below:

"Financial Remuneration
The fundamental principle is that the main financial return to the AO may be derived from its equity participation. However, it is recognized that in undertaking its functions in an efficient and effective manner that some part of its remuneration will come from the AOA.
The financial returns to the AO through AOA should occur on two basis and be subject to the approach set out below:

Return for provision of services

Any service provided should be on a fee for service basis and not on a fixed fee. Further any additional services as stated in para 4 provided by AO should be the subject of the annual agreement between JVC and the AO, which set out such services and fees. These services should be remunerated based on the agreed rate.

Performance based fee

A second, performance-based fee can be provided for, which must be linked to measurable performance and outcome achieved. The fee may be expressed as a percentage of any one parameter such as profit, EBIT, EBIDTA or revenue, provided however that in such event the AO must comply with the requirement to have generated demonstrable value add.

There must also be a clear linkage between the performance-based fee and the outcomes achieved for service quality."

2.5.7.3 The AOA between MIAL and ACSA provides for two types of remuneration viz., (i) Provision for services on fee for service basis and (ii) performance fee – a fixed amount of $ 1 million which is to be adjusted for changes in US CPI inflation. The fee paid by MIAL during the Second Control Period falls under the performance fee category.

2.5.7.4 As per the original agreement this performance fee was payable for a period of 7 years starting 2006. However as submitted by MIAL and duly noted in the 6.56 of the tariff order (Order No. 13 / 2016-17 / MIAL) by AERA, due to the requirement of expertise and services of ACSA, the AO agreement was amended on 27.01.2010 via addendum to airport operator agreement and the point related to the discontinuation of performance fee has been deleted.

2.5.7.5 The issue of segregation of AO fees was commented upon by ICWAI-MARF in their report dated 17th February 2016 which was placed in the public domain vide consultation paper no. 10 / 2015-16-MIAL-MYTP. ICWAI-MARF has commented that the performance fee paid to ACSA was towards transfer of capital asset and that accordingly it must be capitalized segregated based on the overall ratio of Aeronautical and Non-aeronautical assets at CSMIA, Mumbai. However, MIAL has not capitalized the fees but accounts for it as a revenue expenditure. Hence, the treatment suggested by ICWAI-MARF could not be adopted.

2.5.7.6 As noted by AERA in para 6.55 of its tariff order no. 13/2016 – 17/ MIAL, MIAL had submitted that the performance fee paid is not linked to revenues or profits of the airport but to the operation and maintenance of Aeronautical and Non-aeronautical assets of the airport. MIAL had requested the Authority to consider the allocation of AOA based on the overall ratio of Aeronautical and Non-aeronautical assets or the overall ratio of Aeronautical and Non-aeronautical expenses. However, AERA had segregated the expense based on the man-power headcount ratio based on the logic that the AO (ACSA Global Limited) would have to deploy manpower in the same ratio as MIAL.

2.5.7.7 MIAL has classified the AOA fees as fully Aeronautical in the true-up section of its MYTP submission for Third Control Period based on the premise that no assistance is being availed from ACSA Global Limited (AO) for Non-aeronautical purposes. However, this claim was not demonstrated to us with any supporting evidence.

2.5.7.8 In view of the grounds stated above, capitalization of the expense is not possible as the fees paid has been accounted as a revenue item, segregation of the fees paid based on the man power count or considering the same as wholly Aeronautical may not be appropriate in the absence of information on man power deployed by AO. Therefore, we suggest segregating the AO fees based on the Adjusted Gross Fixed Assets Ratio of 82.58% (Refer Table 67). Impact of revision in the segregation ratio has been shown in *Table* 39 below:

Table 39: Revision of AOA Fee segregation ratio

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total expense	8.10	8.82	8.83	8.89	9.70	44.34
Aeronautical % of total expense	*100%*	*100%*	*100%*	*100%*	*100%*	
Amount	8.10	8.82	8.83	8.89	9.70	44.34
Adjustment						
Airport Operation Assistance Fees	(1.41)	(1.53)	(1.53)	(1.55)	(1.69)	(7.72)
AOA Fee (post-adjustments)	6.69	7.29	7.30	7.34	8.01	36.62
% of total expense	82.58%	82.58%	82.58%	82.58%	82.58%	82.58%

2.5.8 Insurance expense

Description of the Expense:

2.5.8.1 Major items in insurance expense include premium paid for industrial all risk policy, terrorism policy, airport operators' liability.

MIAL's segregation logic:

2.5.8.2 MIAL has classified insurance expenses as completely Aeronautical for FY 18 & FY 19 but applied a different approach for earlier years viz., classifying cost of certain policies such as Terrorism Cover & Airport Operator Liability as fully Aeronautical.

Outcome of this study:

Table 40: Impact of revised segregation logic - Insurance Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Ref.
Total expense	5.14	4.63	3.94	4.15	4.93	22.79	
AERONAUTICAL % MIAL	89%	94%	87%	100%	100%		
AERONAUTICAL MIAL	4.56	4.36	3.43	4.15	4.93	21.43	
Adjustment							
Insurance expense	(0.31)	(0.55)	(0.18)	(0.72)	(0.85)	(2.61)	2.5.8.3
Total Adjustments	(0.31)	(0.55)	(0.18)	(0.72)	(0.85)	(2.61)	
Aeronautical after adjustments	4.25	3.81	3.25	3.43	4.08	18.82	
Ratio	**82.58%**	**82.58%**	**82.58%**	**82.58%**	**82.58%**	**82.58%**	

2.5.8.3 It is not appropriate to classify the insurance premium entirely as Aeronautical as the policy would cover risks arising from and assets used in Non-aeronautical activities also. Accordingly, we suggest segregation of the insurance premium using the Gross Fixed Assets Ratio. Impact of revision of the segregation ratio is given in Table *41* below:

Table 41: Reclassification of Insurance premium expense

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Insurance Premium	5.23	4.72	4.00	4.23	4.99	23.17
Aeronautical Ratio – MIAL%	89%	94%	87%	100%	100%	
Revised Aeronautical Ratio %	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.31)	(0.55)	(0.18)	(0.72)	(0.85)	(2.61)

2.5.9 Consumable stores

Description of the Expense:

2.5.9.1 Consumable stores include expenses incurred towards purchase and consumption of facility stores including engineering stores, cleaning chemicals and other consumables.

MIAL's Existing Segregation logic:

2.5.9.2 MIAL has segregated consumables based on the nature of individual expense line items by applying the principles in section 2.2 of this report. Expenses common to Aeronautical and Non-aeronautical activities that have been allocated to the common cost centres 'Airport Common' and 'Corporate Overheads' has been segregated based on the expense ratio (as before allocation of common costs).

Outcome of this study:

Table 42: Revision of common expenses segregation ratio - Consumables Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	4.44	7.48	8.23	6.07	6.60	32.82	
AERONAUTICAL % MIAL	89%	90%	99%	96%	96%		
AERONAUTICAL MIAL	3.96	6.73	8.13	5.85	6.37	31.04	
Adjustment							
Common Expenses	-	(0.15)	(0.01)	(0.02)	(0.02)	(0.20)	2.5.9.3
Corporate Overheads	-	(0.01)	-	(0.04)	(0.04)	(0.09)	2.5.9.3
Total Adjustments	-	(0.16)	(0.01)	(0.06)	(0.06)	(0.29)	
Aeronautical after adjustments	3.96	6.57	8.12	5.79	6.31	30.75	
Ratio	89.19%	87.83%	98.66%	95.39%	95.54%	93.68%	

2.5.9.3 We have used the 'weighted average terminal floor space ratio' of the airport for segregation of expenses allocated to 'Airport Common Cost Centre' and 'Gross Fixed Assets Ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'Corporate Overheads' cost centre. The rationale for changes relating to the Corporate Overhead / Airport Common cost centre has been discussed in section 2.6. *Table 43* shows in the impact on account of change in the ratio of airport

common cost centre and *Table* 44 show the impact of change in the ratio of corporate overheads cost centre.

Table 43: Impact of change in the ratio of 'airport common' cost centre – Consumable Stores

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Airport Common Costs*	-	2.51	0.28	0.36	0.36	3.51
Segregation ratio MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised segregation ratio	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	-	(0.15)	(0.01)	(0.02)	(0.02)	(0.20)

Table 44: Impact of change in the ratio of 'Corporate Overheads' cost centre – Consumable Stores

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Corporate Overheads*	-	0.06	0.04	0.37	0.37	0.85
Segregation ratio MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised segregation ratio	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	-	(0.01)	-	(0.04)	(0.04)	(0.09)

2.5.10 Operating cost

Description of the expense:

2.5.10.1 Operating cost includes expenses incurred towards cleaning contracts, security contract, horticulture expenses, inter-terminal coaches, trolley management contracts and other operating contracts such as golf cart services within the terminal, medical emergency facilities and passenger service management.

MIAL's Segregation logic:

2.5.10.2 MIAL has segregated operating cost on the nature of individual expense line items by applying the principles in section 2.2 of this report. Expenses common to Aeronautical and Non-aeronautical activities that have been allocated to the common cost centres 'Airport Common' and 'Corporate Overheads' has been segregated based on the expense ratio (directly allocated exepnses ratio as before allocation of common costs).

2.5.10.3 Cleaning charges have been fully classified as Aeronautical as the concessionaires (duty fee & retail shops) are responsible for the cleanliness of their area. Security contract expenditure is classified as fully Aeronautical unless the expense relates to securing the land bank of the airport which falls under the real estate vertical. Horticulture expenses are classified as Aeronautical unless the activity relates to an area outside the terminal that falls under Non-aeronautical activity (eg. multi-level car park). Inter-terminal coaches and trolley management contracts are wholly classified as Aeronautical. Golf cart services for passengers requiring support is classified as Aeronautical unless they are separately charged for it (guest services). Passenger service management, medical assistance and emergency related facilities have been classified as wholly Aeronautical.

Outcome of this study:

Table 45: Impact of Revision in segregation logic of certain expense items classified under operating cost

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Ref.
Total expense	89.21	116.47	133.02	138.68	143.09	620.47	
AERONAUTICAL % MIAL	94.83%	91.82%	90.86%	91.48%	94.00%		
AERONAUTICAL MIAL	84.60	106.94	120.86	126.87	134.57	573.84	
Adjustment							
Security Expense	(0.08)	(0.12)	(2.01)	(1.62)	(2.75)	(6.58)	2.5.10.4
Common Expenses	(0.01)	(0.17)	(0.13)	(0.10)	(0.10)	(0.51)	2.5.10.5
Corporate Overheads	(0.07)	(0.11)	(0.12)	(0.20)	(0.42)	(0.93)	2.5.10.5
Total adjustments	(0.16)	(0.40)	(2.26)	(1.92)	(3.27)	(8.01)	
AERONAUTICAL after Adjustments	84.44	106.54	118.60	124.95	131.30	565.83	
Ratio	94.65%	91.47%	89.16%	90.10%	91.76%	91.19%	

2.5.10.4 On test examination of segregation of major items of expenses, we have identified the below instances of incorrect classification in security contract expenses. Relevant reclassifications have been suggested in *Table 46* below:

Table 46: Reclassifications identified in security expenses

(₹ crores)

Year	Amount	Impact On Aeronautical cost	Remarks
2014-15	0.43	(0.08)	Head office security reclassified as corporate overheads
2015-16	0.66	(0.12)	Head office security reclassified as corporate overheads
2016-17	1.66	(1.66)	Security Expenses relating to Land Department – Non -Aeronautical
2016-17	1.97	(0.35)	Security Expenses relating to Land Department – Common
2017-18	1.62	(1.62)	Security Expenses relating to Land Department – Non-aeronautical
2018-19	2.65	(2.65)	Security Expenses relating to Land Department – Non-aeronautical

Year	Amount	Impact On Aeronautical cost	Remarks
2018-19	0.57	(0.10)	Security Expenses relating to Land Department – Common
Total	9.56	(6.58)	

2.5.10.5 We have used the 'weighted average terminal floor area ratio' of the airport for segregation of expenses allocated to 'airport common cost centre' and 'gross fixed assets ratio' at the close of 31st March 2019 for segregation of expenses allocated to 'corporate overheads' cost centre. The rationale for changes relating to the Corporate Overhead /Airport Common cost centre has been discussed in section 2.6. Table 47 shows the impact on account of change in the ratio of Airport Common cost centre and *Table 48* shows the impact of change in the ratio of corporate overheads cost centre.

Table 47: Impact of change in the ratio of 'airport common' cost centre – Operating Expenses

(₹ crores)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Airport Common cost centre	0.57	2.81	3.62	2.09	1.92	11.01
Segregation ratio MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised segregation ratio	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of revision	(0.01)	(0.17)	(0.13)	(0.10)	(0.10)	(0.51)

Table 48: Impact of change in the ratio of 'Corporate Overheads' cost centre – Operating Expenses

(₹ crores)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Corporate Overheads	1.07	1.03	1.46	2.06	4.21	9.83
Segregation ratio MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Revised segregation ratio	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision	(0.07)	(0.11)	(0.12)	(0.20)	(0.42)	(0.93)

2.5.11 Bad debts

Description of expenses:

2.5.11.1 Bad debts include moneys due to MIAL in respect of Aeronautical and Non-aeronautical activities, written off during the control period.

MIAL's segregation logic:

2.5.11.2 MIAL has classified the entire bad debts incurred during the control period as wholly Aeronautical.

Outcome of this study:

Table 49: Impact of revised segregation logic - Bad Debts

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total expense	-	1.73	4.84	-	0.35	6.92
AERONAUTICAL % MIAL	100%	100%	100%	100%	100%	
AERONAUTICAL MIAL	-	1.73	4.84	-	0.35	6.92
Adjustment						
Bad debts	-	(1.73)	(4.84)	-	(0.30)	(6.87)
AERONAUTICAL after Adjustments	-	-	-	-	0.05	0.05
Ratio	-	-	-	-	14.29%	14.29%

2.5.11.3 Bad Debts written off is to be grouped based on the nature of the item written off. On examination of the nature of dues written off provided by MIAL, we identified cases where the classification should have been Non-aeronautical in nature, accordingly they have been reclassified *Table 50* below.

Table 50: Reclassification of Bad Debts written off

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Bad debts written off	-	1.73	4.84	-	0.35	6.92
MIAL segregation ratio %	100%	100%	100%	100%	100%	
Bad debts – Non-aeronautical	-	1.73	4.84	-	0.30	6.87
Revised segregation ratio%	-	-	-	-	14.29%	14.29%

2.5.12 Working capital interest

Description of expense:

2.5.12.1 Working capital comprises both Aeronautical and Non-aeronautical working capital. Consequently, interest will also comprise Aeronautical and Non-aeronautical portions.

MIAL's segregation logic:

2.5.12.2 MIAL has classified the whole of working capital interest as Aeronautical expense based on the premise that working capital is utilized only towards the working capital needs of Aeronautical activities.

Outcome of this study:

Table 51: Impact of revised segregation logic - working capital interest

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total expense	6.31	30.84	18.51	6.41	9.35	71.42
AERONAUTICAL % MIAL	100%	100%	100%	100%	100%	
AERONAUTICAL MIAL	6.31	30.84	18.51	6.41	9.35	71.42
Adjustment						
Reclassification as corporate overhead @ 82.58%	(1.10)	(5.37)	(3.22)	(1.12)	(1.63)	(12.44)
AERONAUTICAL after Adjustments	5.21	25.47	15.29	5.29	7.72	58.98
Ratio	82.58%	82.58%	82.58%	82.58%	82.58%	82.58%

2.5.12.3 As working capital might comprise dues arising from Aeronautical services, retail concessions, land leases etc. One way of segregating working capital interest would be by classifying it as a corporate overhead. Accordingly, we have used the gross fixed assets ratio as on 31st March 2019 for segregation as shown in *Table* 52 below:

Table 52: Reclassification of working capital interest

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Working capital interest	6.31	30.84	18.51	6.41	9.35	71.42
Aeronautical Ratio % - MIAL	100%	100%	100%	100%	100%	
Revised Ratio %	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of reclassification	1.10	5.37	3.22	1.12	1.63	12.44

2.5.13 Finance charges

Description of the expense:

2.5.13.1 Financing charges includes loan processing fees paid to bankers, arranger's fee, upfront fee relating to raising of funds through terms loans, securitization of development fee and securitization of real estate deposits, guarantee commission paid to bankers, interest on delayed payment of annual fees.

MIAL's segregation logic:

2.5.13.2 MIAL has used 89.10% for allocation of financing charges based on the projections considered by AERA in Table 49 of Order No. 13/2016-17/MIAL for tariff determination of the Second Control Period. On reading para 6.75 of the above order we understood that the ratio used was the expense

ratio (i.e., ratio of directly allocable Aeronautical expenses to total expenses as before apportionment of common expenses).

Outcome of this study:

Table 53: Impact of revised segregation logic – Financing Charges

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	9.34	10.79	29.12	38.02	41.14	128.41	
AERONAUTICAL % MIAL	89%	89%	89%	89%	89%		
AERONAUTICAL MIAL	8.32	9.61	25.95	33.87	36.65	114.40	
Adjustment							
Interest paid on annual fees	-	(0.82)	(0.20)	-	-	(1.02)	*Table 54*
Bank charges and BG commission	(0.35)	(0.71)	(0.13)	(3.17)	-	(4.36)	*Table 54*
Impact on reclassification as Corporate Overhead	(0.59)	(0.60)	(1.88)	(2.27)	(3.16)	(8.50)	2.5.13.4
Total Adjustments	(0.95)	(2.13)	(2.21)	(5.44)	(3.16)	(13.88)	
AERONAUTICAL after Adjustments	7.37	7.48	23.74	28.43	33.49	100.52	
Ratio	79.06%	69.29%	81.53%	74.77%	81.40%	78.28%	

2.5.13.3 On examination of the disaggregation of financing charges provided to us by MIAL we noticed the items mentioned in *Table 54* below had to be reclassified as Non-aeronautical:

Table 54: Reclassification of certain expense items in "Financing Charges"

(₹ crores)

Year	Remarks	Expense Amount ₹ crores	Reclassification Impact ₹ crores
2015-16	Interest paid to AAI on delayed remittance of annual fees has been considered as Non-aeronautical in full as annual fee is not a pass -through expense	0.82	(0.82)
2016-17		0.20	(0.20)
2014-15	Guarantee commission paid to bank relating to Non-aeronautical activities	0.35	(0.35)
2015-16		0.71	(0.71)
2016-17		0.13	(0.13)

2017-18		3.17	(3.17)
		Total	(5.38)

2.5.13.4 Using the expense allocation ratio may not be appropriate as finance charges largely relates to sourcing of long-term finance for funding the capital expenditure. Therefore, it would be more appropriate to segregate it in the ratio of gross Aeronautical fixed assets as shown in *Table* 55 below:

Table 55: Revision of Segregation ratio for financing charges

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Financing Charges*	8.99	9.26	28.79	34.85	48.48	130.37
Aeronautical Ratio MIAL %	89.10%	89.10%	89.10%	89.10%	89.10%	
Revised Aeronautical Ratio	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of Revision	(0.59)	(0.60)	(1.88)	(2.27)	(3.16)	(8.50)

*Amount after removal of items reclassified as Aeronautical

2.5.14 Voluntary retirement scheme cost:

Description of the Expense:

2.5.14.1 Under clause 6.1.4 of the OMDA if less than 60% of the General Employees (defined in the OMDA) accept the offers of employment made by MIAL, then MIAL shall pay to AAI retirement compensation for such number of employees as represent the difference between 60% of the General Employees and the number of General Employees accepting offers of employment made by MIAL, including cumulatively the offers made and accepted during the operational support period.

2.5.14.2 MIAL has capitalized VRS compensation in line with the accounting standards and amortizing it on a yearly basis. Whereas for the purpose of tariff determination, AERA has been allowing VRS compensation on payment basis in line with Decision VII.b. of Order No. 32/2012-13 **MIAL-MYTO.**

MIAL's Segregation Logic:

2.5.14.3 MIAL is considering the entire payment made during the control period towards retirement compensation as Aeronautical based on the premise that the payment was made to AAI as per the terms of OMDA.

Outcome of this study:

Table 56: Impact of revised segregation - VRS compensation paid

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	20.43	19.98	19.29	18.55	17.89	96.14	
AERONAUTICAL % MIAL	100%	100%	100%	100%	100%		
AERONAUTICAL MIAL	20.43	19.98	19.29	18.55	17.89	96.14	
Adjustment							

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
VRS Expenses	(3.12)	(3.23)	(2.68)	(2.32)	(1.92)	(13.27)	2.5.14.4
AERONAUTICAL after Adjustments	17.31	16.75	16.61	16.23	15.97	82.87	
Ratio	84.73%	83.83%	86.12%	87.51%	89.30%	86.20%	

2.5.14.4 VRS compensation must be treated as employee cost and segregated using ratio used for employee cost based on the reasoning that the continuation of the retired employees would have resulted in additional employee cost that would have been segregated in the employee cost allocation ratio. Impact of revision in the segregation logic has been shown in *Table* 57 below:

Table 57: Revision of segregation ratio in respect of employee compensation

(₹ crores)

	FY 15	FY 16	FY 17	FY 18	FY 19	Total
VRS compensation	20.43	19.98	19.29	18.55	17.89	96.14
Aeronautical Ratio MIAL %	100%	100%	100%	100%	100%	
Revised Aeronautical Ratio%	84.73%	83.83%	86.12%	87.51%	89.30%	
Impact of Reclassification	(3.12)	(3.23)	(2.68)	(2.32)	(1.92)	(13.27)

2.5.15 Loss on scrapping of asset

Description of the Expense:

2.5.15.1 Loss on scrapping of asset represent the shortfall between the sale value / net realizable value of a scrapped asset and its written down value.

MIAL's segregation Logic:

2.5.15.2 MIAL has classified loss on sale of assets as wholly Aeronautical.

Outcome of this study:

Table 58: Impact of revision in segregation logic - Loss on scrapping of asset

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	245.48	2.35	1.75	0.00	(1.24)	248.34	
AERONAUTICAL % MIAL	100%	100%	100%	100%	100%		
AERONAUTICAL MIAL	245.48	2.35	1.75	0.00	(1.24)	248.34	
Adjustment							
Loss on Sale of asset	(3.26)	(0.41)	(0.30)	-	0.22	(3.76)	2.5.15.3
AERONAUTICAL after Adjustments	242.22	1.94	1.44	0.00	(1.02)	244.58	
Ratio	98.67%	82.58%	82.58%	-	82.58%		

2.5.15.3 Generally, the classification of the loss on sale of asset has to be on the basis of existing segregation ratio of the asset. This is because the depreciation in respect of the asset would have been allowed in the Aeronautical ratio and loss on sale of asset is nothing but a shortfall in the depreciation provided in respect of the asset.

2.5.15.4 MIAL incurred a total of ₹ 248.30 crores during Second Control Period as loss on scrapping of asset, out of which ₹ 245 crore was on account of demolition of old terminal 2 building. The building was transferred by AAI as per the concession and after the transfer, refurbishments were made by MIAL. The loss relates to de-recognition of those refurbishments on demolition of the terminal, to make way for the new terminal building. AERA had considered this loss as expense for the tariff determination but only to the extent of Aeronautical portion by applying the asset allocation ratio of 83.97%. The expense has been considered as Aeronautical on the premises set out in 2.5.15.6 below.

2.5.15.5 Following information was submitted for our consideration by MIAL:

"The old T2 building admeasuring 43002 sq m was demolished for the construction of Apron and new T2 building, since it was falling under footprints of the new T2 under construction and the adjoining apron.

Out of 43002 sq m 38,650 sq m area was used for the construction of Apron and remaining area measuring 4352 sq m of old T2 went into construction of New T2 building. Based on this usage, total area under Aeronautical usage from the old T2 would be 98.54%, computed in the table below together with a drawing depicting new T2 and allied apron superimposed with the drawing of the old T2 demolished.

The 98.54% of the Loss on Scrap of Assets should be considered as Aeronautical and should not be based on allocation ratio of 83.97% being the ratio for the new T2."

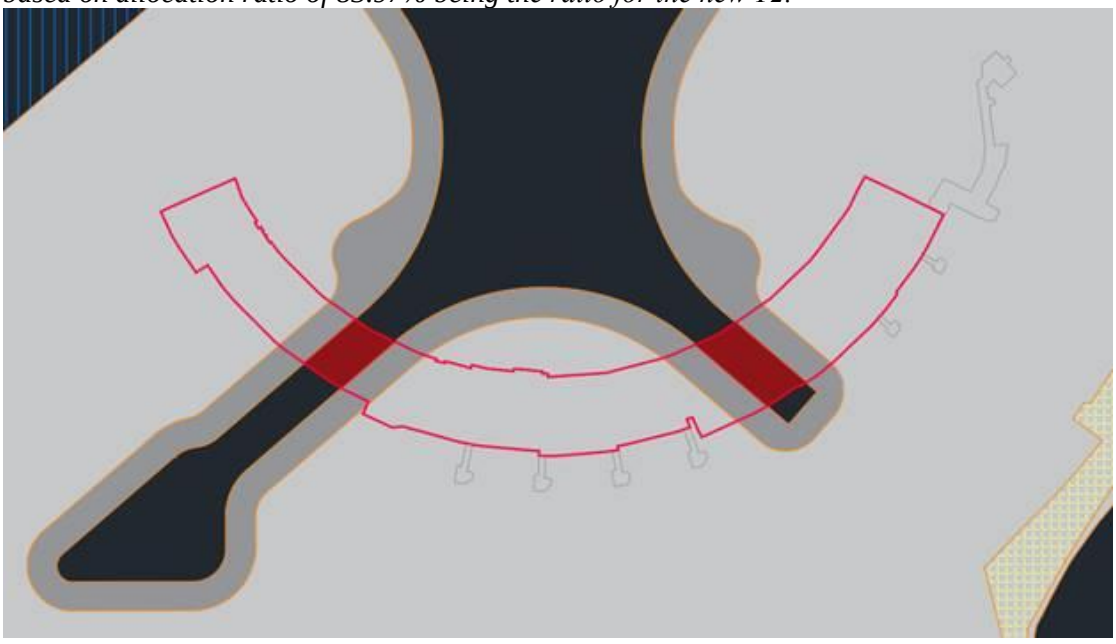


Table 59: Utilization of footprint area of demolished old terminal 2 building

Particulars	Area sq. m	Remarks
New T2 building	4,352	Overlapped with old terminal building footprint (red)
New T2 Apron	38,650	
Total	43,002	Overall old T2 footprint area (Red outline)

Table 60: Aeronautical Area out of the total area utilized

Particulars	Area sq. m	Remarks
New T2 Building	3,779	4,352 sq. m x 86.84% - Aeronautical area of New Terminal 2 as per the survey report provided to us dated 18th Nov 2019
New T2 Apron	38,650	
Total Aeronautical Area	42,429	
% of Aeronautical Area	98.67%	42,329 / 43,002

2.5.15.6 Considering the information detailed in section 2.5.15.5 above, it can be noted that the old terminal building was demolished to facilitate the construction of the new terminal building and apron. Therefore, the loss incurred on demolition of the modifications/additions/refurbishments etc of the old terminal building is an enabling cost for construction of the new terminal building. Accordingly, the loss on scrapping of the asset has been segregation in the ratio of 98.67% (Aeronautical),as shown in Table 60 above, based on the actual utilization of the demolished area. Impact of the segregation has been given in *Table 61* below:

Table 61: Revision of segregation ratio of loss on scrapping of assets

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Loss on scrapping of Assets	245.48	2.35	1.75	-	(1.24)	248.34
Segregation Ratio MIAL%	100%	100%	100%	-	100%	
Revised segregation ratio %	98.67%	82.58%	82.58%	-	82.58%	
Impact of revision in the segregation ratio	(3.26)	(0.41)	(0.30)	-	0.22	(3.76)

2.5.16 Exchange gain or loss

Description of Expense:

2.5.16.1 Exchange gain or loss is the effect of movement in the foreign exchange rates arising on settlement or restatement of foreign exchange monetary items in line with the accounting standards.

MIAL's segregation logic:

2.5.16.2 MIAL has considered foreign exchange gain or loss as fully Non-aeronautical. However, no basis was given to us for considering it as fully Non-aeronautical.

Outcome of this study:

Table 62: Impact on revised segregation logic - Exchange Gain or Loss

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Total expense	12.97	14.89	(19.53)	0.24	0.43	9.00	
AERONAUTICAL % MIAL	0%	0%	0%	0%	0%	-	
AERONAUTICAL MIAL	-	-	-	-	-	-	

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total	Reference
Adjustment							
Impact on reclassification as corporate overhead	10.71	12.30	(16.13)	0.20	0.35	7.43	2.5.16.3
AERONAUTICAL after Adjustments	10.71	12.30	(16.13)	0.20	0.35	7.43	
Ratio	82.58%	82.58%	82.58%	82.58%	82.58%	82.58%	

2.5.16.3 Exchange gain or loss has to be classified based on the nature of the dues settled / restated. However, considering the practical limitations and availability of information, we have considered exchange gain / loss as a corporate overhead and segregated based on the overall Aeronautical asset ratio. We were informed that the source of exchange difference was import of goods and services by MIAL for airport operations. Impact of the works reclassification has been shown in below:

Table 63: Reclassification of Exchange gain and loss

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Exchange gain / loss	12.97	14.89	(19.53)	0.24	0.42	8.99
Aeronautical Ratio MIAL%	0%	0%	0%	0%	0%	
Revised Aeronautical Ratio %	82.58%	82.58%	82.58%	82.58%	82.58%	
Impact of revision in the segregation ratio	10.69	12.28	(16.10)	0.20	0.35	7.42

2.5.17 Capital work in progress written off

Description of the expense:

2.5.17.1 The expense comprises losses incurred by MIAL on write of capital in progress discontinued for various reasons.

MIAL's segregation logic:

2.5.17.2 MIAL has considered the CWIP written off during the control period as a common item given the use of the completed asset. The CWIP written off during the year 2015-16 was the only such item during the control period. It was informed to us by MIAL that the asset that was under construction was Airport Management Building.

2.5.17.3 Airport Management Building was planned for various airport management and administration functions at a location near to the New Terminal 2. The project being part of EPC contract scope, construction of the building commenced in March 2012 by L&T. However, MIAL could not ensure the availability of land for completion of the structure due to the refusal of slum dwellers to vacate the area. Hence MIAL had abandoned the project and the amount spent on the project thus far had to be written off.

2.5.17.4 The loss incurred by MIAL in this regard is not towards operating or maintenance of the airport. Accordingly, we consider the same outside our scope. However, AERA may decide the matter based on further inputs from MIAL. **₹ 13.54 crores** was the loss incurred by MIAL towards CWIP written off, out of which **₹ 11.68** crores was claimed as Aeronautical.

2.6 Segregation of common costs

The following common costs centres were being used by MIAL for segregation purposes:

Table 64: List of common cost centres

Cost Centre	Description	Classification for regulatory purposes	Cost Driver for Segregation of common expenses
Aeronautical Common	For cost common to Aeronautical activities	Aeronautical	NA
Airport Common	For costs common to Aeronautical and Non-aeronautical activities	Common	Expense Ratio
Non-aeronautical Common	For costs common to Non-aeronautical activities	Non-aeronautical	NA
Corporate Overheads	For allocation of corporate overheads applicable at the entity level	Common	Expense Ratio

Arguments against usage of "Directly allocated expenses ratio"

2.6.1 Costs directly attributable to Aeronautical / Non-aeronautical are identified and accumulated. The ratio of Aeronautical to Non-aeronautical expenses at this stage i.e., before allocation of common costs is the "Directly allocated expenses ratio" or "expenses ratio" used by MIAL for allocation of common costs.

2.6.2 'Expenses ratio' used by MIAL during the control period has been shown in *Table 65* below:

Table 65: Expenses Ratio used by MIAL for Second Control Period

	FY 15	FY 16	FY 17	FY 18	FY 19
Expenses ratio	89.29%	93.28%	90.91%	92.32%	92.32%

2.6.3 Essential criteria for choice of a cost driver for segregation of common costs are:

i) Cost driver should be reasonably representative of the benefits consumed / efforts & assets deployed for conduct of the activities

ii) Minimal volatility on a year to year basis

2.6.4 Directly allocated expenses ratio is not representative of the efforts deployed on Aeronautical / Non-aeronautical activities. It can be noticed that the Aeronautical ratio in 2014-15 was 89.29% which increased to 93.28% in 2015-16 followed by a drop in 2016-17 to 90.91%. It cannot be construed that the efforts involved in conduct of Aeronautical activities increased in 2015-16 but dropped in 2016-17.

2.6.5 Directly allocated expenses ratio is subjected to the volatility in prices, efficiencies / inefficiencies associated with the operations and presence of non-recurring / extra-ordinary items.

2.6.6 Further, cost accounting process is being carried out on manual basis by using ledger outputs generated from the accounting package after the completion of financial audit for a financial year.

The current exercise is laborious and prone to errors due to volume of transactions. The best practice would be to assign cost centres at the transaction accounting stage either through additional fields in the voucher entry screen or through assigning cost centres to purchase orders. This process would enable more accurate allocation of costs between cost centres in the absence of which the expense ratio may not appropriate for segregation of common costs.

Appropriate ratio for segregation of common costs

Airport Common

2.6.7 MIAL uses two common cost centres for accumulation of expenses that are common to Aeronautical and Non-aeronautical activities viz., 'Airport Common' and 'Corporate Overheads'. Airport Common cost centre is used for recording costs common to both Aeronautical and Non-aeronautical services within the airport other than corporate level expenses such as professional fees, audit fees, legal fees, general advertisement, guest house maintenance, corporate office maintenance etc. Weighted average terminal floor area ratio of the terminal would be the most appropriate cost driver for these costs given its the lesser volatility and fair representation of the efforts involved. However, if specific cost drivers have been suggested by us in respect of an expense, those expenses may be segregated based on such cost drivers (Eg. Power cost).

Table 66: Weighted Average Terminal Floor Area Ratio

Location	Aeronautical Area	Total Area	%	Reference Terminology
Terminal 1	87,235	97,621	89.36	Terminal Floor Area Ratio
Terminal 2	3,89,403	4,48,432	86.84	
GA Terminal	848	890	95.30	
Total	4,77,486	5,46,943	**87.30**	Weighted Average Terminal Floor Area Ratio

Corporate Overheads

2.6.8 Corporate overheads represent expenses incurred for the entity as a whole and not driven by the extent of Aeronautical or Non-aeronautical operations. Expenses incurred under this cost centre include professional fees, legal fees, corporate support fees, guest house rental etc. We suggest the overall Aeronautical assets ratio for segregation of corporate overheads as this would represent all the activities carried on by the airport inside and outside the terminal.

2.6.9 As per our report on *"Allocation of Assets between Aeronautical and Non-aeronautical activities" (RFP-03/2018-19)* the ratio of gross Aeronautical fixed assets (gross fixed assets ratio) has been established to be **82.58%.** This ratio has been adopted for segregation of corporate overheads.

Table 67: Gross Fixed Assets ratio as per report under RFP 03/ 2018-19

(₹ crores)

Particulars	Aeronautical	Non-aeronautical	Total
Closing Gross Block (as at 31st March 2019)	12,391.85	2,655.05	15,046.90

Particulars	Aeronautical	Non-aeronautical	Total
Gross Fixed Asset Ratio before adjustment	**82.35%**	**17.65%**	
Impact of change in floor area ratio	76.47	(76.47)	
Adjustments during Second Control Period			
Reclassification of Aeronautical to Common			
Terminal Building and Electrical Works	(6.11)	6.11	
End User Devices / Software	(0.34)	0.34	
ERP related cost	(0.16)	0.16	
Project Office Cost	(0.05)	0.05	
UPS and batteries	(0.58)	0.58	
Reclassification of Aeronautical to Non-aeronautical			
Perimeter wall around real estate plot	(0.44)	0.44	
Custodian Management Software – Cargo	(0.29)	0.29	
Piped Natural Gas System	(4.77)	4.77	
Finishes and services works in Air India offices	(0.99)	0.99	
Shivaji Statue	(27.91)	27.91	
Network infrastructure	(2.50)	2.50	
Reclassification of Common to Aeronautical			
Perimeter Wall around airport premises	0.06	(0.06)	
IT Infrastructure for Air India Office at T2	0.05	(0.05)	
CCTV Camera at T2	0.31	(0.31)	
Assets located inside the terminal	0.75	(0.75)	
Reclassification of Common to Non-aeronautical			
Piped Natural Gas System	(4.05)	4.05	
Distributed Antennae System	(1.18)	1.18	
Reclassification of Non-aeronautical to Aeronautical			
Flight Information Display Systems	1.90	(1.90)	
Public Address System	4.28	(4.28)	
Gross Block after adjustments	12,426.30	2,620.60	15,046.90
Gross Fixed Asset Ratio after adjustment	82.58%	17.42%	

2.6.10 Impact of revision in the segregation of ratio of 'Airport Common' has been shown in

2.6.11
2.6.12
2.6.13

Table 68 below and 'Corporate Overheads' cost centre has been shown in Table 69 below. Appropriate adjustments have been made in respect of this impact under the respective expense heads.

Table 68: Impact of revision in the segregation ratio of 'Airport Common' Cost Centre

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Total Airport Common Cost	52.75	57.86	63.36	77.36	142.23	402.19
Segregation Ratio% - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
Aeronautical Portion	47.10	53.97	57.60	71.42	131.31	361.40
Segregation Ratio% - Revised	87.30%	87.30%	87.30%	87.30%	87.30%	
Impact of Revision	(1.05)	(3.46)	(2.29)	(3.88)	(7.14)	(17.82)
Aeronautical Portion - Revised	46.05	50.51	55.31	67.54	124.17	343.58

Table 69: Impact of revision in the segregation ratio of 'Corporate Overheads' cost centre

(₹ crores)

S. No	Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
(a)	Total Corporate Overheads Cost	47.80	108.69	58.47	74.35	96.91	386.21
(b)	Finance Charges included in (a)	8.99	9.26	28.79	34.85	48.48	130.37
(c)	Segregation Ratio% - MIAL – Finance Charges	89.10%	89.10%	89.10%	89.10%	89.10%	89.10%
(d)	Segregation Ratio% - MIAL	89.29%	93.28%	90.91%	92.32%	92.32%	
(e)	Aeronautical Portion - MIAL [(a)-(b)]x(d) + [(b) x (c)]	42.66	101.00	52.63	67.52	87.91	351.72
(f)	Segregation Ratio% - Revised	82.58%	82.58%	82.58%	82.58%	82.58%	
(g)	Impact of Revision – Finance Charges (b) x [(f) – (d)]	(0.59)	(0.60)	(1.88)	(2.27)	(3.16)	(8.50)
(h)	Impact of Revision – Other Items	(2.60)	(10.64)	(2.47)	(3.85)	(4.72)	(24.28)
(i)	Aeronautical Portion – Revised (e) + (g) + (h)	39.47	89.76	48.28	61.40	80.03	318.94

2.7 Improvisations to MIAL'S cost accounting

Our work was based on cost records produced by MIAL. We have described below the key shortcomings in MIAL's cost accounting and methodology/approach towards computation of segregation ratio for Aeronautical expenses.

2.7.1 Non-usage of ERP for cost accounting

Cost centre allocation is being done after closure of financial books for the year using MS Excel spreadsheet on manual mode. This method lends itself to errors and inaccuracies, it also becomes difficult to preserve the integrity of the data. The best practice in this regard is to update the cost centres in the purchase orders or while accounting for the invoices in the books of accounts. Under this method, since cost centre allocation is concurrent to the transaction accounting the possibility of errors are reduced. The availability of cost centre information in the ERP would improve the reliability and integrity of data, facilitate seamless computation of Aeronautical expenses at the end of the year/control period. List of cost centres and costs allocated thereto have been provided in ***Annexure – 1****.*

2.7.2 Inadequate cost centre allocation for regulatory purposes

In the spreadsheet based manual cost accounting approach, no meaningful allocation was made to certain cost centres such as Terminal 1, Terminal 2, IT, Security, Engineering and Maintenance etc. This would create barriers for conducting any meaningful analysis of costs including benchmarking at cost centre level. It is suggested to strengthen the cost accounting system to facilitate availability of reliable and useful cost data.

2.7.3 Inadequate cost centres

The number of cost centres used by MIAL is inadequate for regulatory purposes as it lacks requisite detailing. For example: it is not possible to identify the cost of operating terminal 2 with disaggregation for cost items such as engineering, civil, electrical, cleaning, security etc. Further MIAL has only two common cost centres viz., 'Airport Common' and 'Corporate Overheads". Having a single common cost centre would mean usage of cost drivers on global basis for segregating the Aeronautical costs. It is suggested to have one common cost centre per terminal and retain corporate overhead cost centre. Terminal specific common cost centres could facilitate application of terminal specific cost drivers for segregation for more accurate computation of Aeronautical costs. For example: Common costs of New Terminal 2 can be segregated using the floor space ratio of New Terminal 2 building.

2.8 Chapter summary

2.8.1 Based on our study as reported above, we have concluded that the Aeronautical Operation and Maintenance expense of ₹ 3,997.41 crores as claimed by MIAL for the Second Control Period (FY14-19) be reduced by ₹252.67 crores. *Table 70* below summarizes the adjustments made by us:

Table 70: Summary of adjustments to the Aeronautical expenses as segregated by MIAL

(₹ crores)

Operation and Maintenance Expense	FY 14-19	Table Ref.	Para. Ref.
A. Total O&M Expense During the Second Control Period as per MYTP Submission ***(based on audited financials up to FY 19)***	**3,997.41**		
B. Aeronautical Expenses included in (1) above as per MIAL	**3,721.10**		
C. Non-aeronautical Expenses included in (2) above as per MIAL	**276.31**		
D. Impact on (2) due to change in segregation logic			
i. Human Resource Cost	(72.95)	*Table* 10	*2.5.1*
ii. Utilities	(11.27)	*Table 16*	*2.5.2*
iii. Repairs and Maintenance	(23.28)	*Table 17*	*2.5.3*
iv. Rent, rates and taxes	(17.50)	*Table 25*	*2.5.4*
v. Advertisement	(1.47)	*Table 30*	*2.5.5*
vi. Administrative Expenses	(53.09)	*Table 33*	*2.5.6*
vii. AOA Fee	(7.72)	*Table* 39	*2.5.7*
viii. Insurance Expense	(2.61)	*Table 40*	*2.5.8*
ix. Consumable Expenses	(0.29)	*Table 42*	*2.5.9*
x. Operating Cost	(8.01)	*Table 45*	*2.5.10*
xi. Bad Debts	(6.87)	*Table 49*	*2.5.11*
xii. Working Capital Interest	(12.44)	*Table 51*	*2.5.12*
xiii. Financing Charges	(13.88)	*Table 53*	*2.5.13*
xiv. VRS costs to AAI employees	(13.27)	*Table 56*	*2.5.14*
xv. Loss on scrapping of Assets	(3.76)	*Table 61*	*2.5.15*
xvi. Foreign Exchange Loss/Gain	7.42	*Table 62*	*2.5.16*
xvii. Capital work in progress written off	(11.68)		*2.5.17*
Total Impact on Aeronautical expenses due to change in segregation logics	**(252.67)**		
E. **Total Adjusted Aeronautical Expenses for Second Control Period (B-D)**	**3,468.43**		

Note:

a) Item No. D(xvii) of the above table includes adjustment relating to capital work-in-progress written off. The Authority may decide the extent to which this expense may be allowed as part of Aeronautical Expenses.

Table 71: Year Wise Adjusted Aeronautical Operating and Maintenance Expenses of Second Control Period

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	123.73	135.40	169.29	173.34	181.01	782.78
Utilities Expenses	102.23	97.90	91.78	108.46	106.57	506.94
Repair & Maintenance Expense	76.82	72.44	91.42	105.79	129.87	476.35
Rents, Rates & Taxes	24.28	3.30	27.68	42.20	69.73	167.19
Advertisement Expense	5.58	6.51	7.84	7.13	7.68	34.73
Administrative Expenses	48.34	74.86	74.15	59.79	73.53	330.67
AOA Fees	6.69	7.29	7.30	7.34	8.01	36.62
Insurance Expense	4.25	3.81	3.25	3.43	4.08	18.82
Consumable stores	3.96	6.57	8.12	5.79	6.31	30.75
Operating cost	84.44	106.54	118.60	124.95	131.30	565.83
Provision for Bad Debts	-	-	-	-	-	-
Bad debts written off	-	-	-	-	0.05	0.05
Working Capital Interest	5.21	25.47	15.29	5.29	7.72	58.98
Financing charges	7.38	7.48	23.74	28.43	33.49	100.52
VRS Expense	17.31	16.75	16.61	16.23	15.97	82.87
Loss on scrapping of Asset	242.22	1.94	1.45	-	-1.02	244.58
Collection charges over DF	-	-	-	-	-	-
Passenger Security Fee Disallowance	9.75	-	13.59	-	-	23.34
Corporate Social Responsibility	-	-	-	-	-	-
Exchange gain and loss	10.71	12.30	-16.13	0.20	0.35	7.43
CWIP - Written off	-	-	-	-	-	-
Investment written off	-	-	-	-	-	-
Total	**772.90**	**578.55**	**653.97**	**688.38**	**774.63**	**3,468.43**

2.8.2 The amount of ₹ 11.68 crores relating to CWIP written-off is the Aeronautical portion of the total expense of ₹ 13.54 crores pertaining to abandoned airport management building project. This amount is not incurred towards operation and maintenance expenses of the Airport. The Authority may decide the allowability of this expense after due consideration of the facts.

2.8.3 For the purpose of allocation of the common expenses, MIAL had used the 'Expense Ratio' ('Directly allocated expense ratio' as existing before allocation of common expenses). 'Expense Ratio' is subject to factors such as volatility, efficiency and presence of extra-ordinary non-recurring items. Consequently, we have considered ***'Adjusted Gross Fixed Asset Ratio'*** **(82.58%)** for **'Corporate Overheads'** as per the report on ***'Allocation of Assets between Aeronautical and Non-aeronautical activities (RFP-03/2018-19)'*** and ***'Weighted Average Floor Area Ratio' (87.30%)*** for other ***'Common Costs'.***

2.8.4 We suggest the below improvisations to MIAL cost accounting system viz.,

a) Using ERP for cost accounting (cost center allocation, apportionment and reporting)

b) Maintaining adequate number of cost centers and using them effectively to generate terminal wise cost

c) *Maintaining terminal wise common cost centers for improved accuracy in allocation of common expenses.*

3 EFFICIENCY IN O&M COSTS OF SECOND CONTROL PERIOD

3.1 Budgeting and review process at MIAL [4]

The procedure followed for the Annual Budget preparation is listed out below:

- Email is circulated to all the user departments for obtaining details relating to projected expenditure for a given year for Budget requirement. This exercise is generally initiated during the first month of the calendar year.
- Information is received from various departmental heads for the proposed budget & details of the related expenses likely to be incurred during the year.
- The details received from various departments are verified to check completeness in all respects.
- In case any further information is required data is finalised in after due discussions with the user department head or based on previous year's data.
- Numbers are compared and validated with previous year's actual to ensure that the budgets are in line with the previous year numbers.
- Budget discussion is initiated with various department head to check if there is any scope of improvement in the budget.
- If any scope of improvement is brought to notice, then the same should be included in the budget.
- The annual budget is bifurcated into monthly budget.
- The budget is compiled and forwarded to the CEO and CFO for review.
- After making the necessary changes the updated Budget compilations are then forwarded to Board of Directors (BOD) for approval.

The mechanism for monitoring of budget vs. actual cost at MIAL was as below:

MIS Reports are generated on a monthly basis by the F&A Dept. The MIS Reporting comprises of the following activities:

- **Extraction of Actual Data:** Actual Data input in the accounting system during the month relating to expenses and revenue heads and the related balance sheet heads are extracted and compiled under the appropriate heads in the MIS template.
- **Provisions for Accrued Expenses and Revenue:** In this process data is collected from the respective departments for accrued expenses and income and provision is made for the bills which are payable or income which are receivable for the month. Journal entries for the payable/receivable provisions are passed in the accounting system on the last day of the month and are reversed on the first day of the subsequent month. The provisions are made every month on zero base cumulative basis. An expense schedule is made listing all the expenses.
- **Preparation of MIS Statement:** Compilation of the data is done on the basis of the data collected from the accounting system and also received from various user departments (like traffic data from the operations, debtors analysis etc. which is not available in the accounting system) which is consolidated to draw the Profit and Loss statement and the Balance Sheet as on the last date of the closed month. The MIS statement is forwarded to the higher management for taking managerial decisions and devising action plans for the ensuing months.
- **Analysis of Variance:** The monthly financial numbers are compared against the corresponding numbers in the same month of the previous year. Similarly, Year to-Date numbers are also compared with the corresponding previous year's numbers. The current year's numbers are also compared with the corresponding budget numbers. The variances are analysed and reasons identified.

[4] Source: Interaction with MIAL

3.2 Projection vs. Actual costs for Second Control Period

In this sub-section, the projected O&M costs submitted to AERA by MIAL (considered by the Authority as per Table 50 of Order No. 13/ 2016-17/MIAL) for tariff determination at the inception of the Second Control Period is compared with the actual O&M costs incurred during the Second Control Period.

Table 72: Projected O&M expenses submitted to AERA for Second Control Period – (A)

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	146.10	168.01	184.81	203.30	223.62	925.84
Utilities Expenses (net off)	103.82	177.20	189.73	201.04	213.31	885.10
Repairs and Maintenance	109.78	133.21	148.96	160.22	176.55	728.72
Rents, Rates and Taxes	28.26	41.43	42.25	43.04	43.90	198.88
Advertisement Expenses	5.75	8.04	6.34	6.66	6.99	33.78
Administrative Expenses	58.52	70.45	64.52	67.94	71.13	332.56
AOA Fees	8.10	8.15	8.21	8.27	8.32	41.05
Insurance Expenses	5.14	8.30	8.50	8.71	9.16	39.81
Consumption and stores expense	4.44	5.01	5.65	6.37	7.19	28.66
Operating Expenditure	89.22	112.97	126.22	143.32	162.99	634.72
Provision for doubtful debt	1.60	0.00	0.00	0.00	0.00	1.60
Bad Debts written off	0.00	0.00	0.00	0.00	0.00	-
VRS Payment to AAI	20.43	19.97	19.29	18.55	17.89	96.13
Provision for PSF (SC) disallowance	9.75	10.72	11.79	12.97	14.27	59.50
Working capital Interest	6.30	6.30	6.30	6.30	6.30	31.50
Financing charges	9.34	9.34	59.34	9.34	9.34	96.70
Loss on scrapping of assets	245.48	-	-	-	-	245.48
Collection charges over DF	3.05	-	-	-	-	3.05
CSR Cost	-	-	-	-	-	-
Exchange gain or loss	-	-	-	-	-	-
Total Operation and maintenance Expenses	**855.06**	**779.09**	**881.68**	**895.82**	**970.87**	**4,382.52**

Table 73: Actual O&M Expenses incurred during Second Control Period – (B)

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	146.06	161.28	196.7	197.94	202.76	904.74
Utilities Expenses (net off)	103.82	98.63	93.48	112.67	109.61	518.21
Repairs and Maintenance	109.78	78.25	101.58	111.22	147.26	548.09
Rents, Rates and Taxes	28.26	5.00	32.03	50.07	88.68	204.04
Advertisement Expenses	5.75	7.11	8.63	8.07	8.41	37.97
Administrative Expenses	58.48	105.75	88.49	78.88	95.29	426.89
AOA Fees	8.10	8.82	8.83	8.89	9.7	44.34
Insurance Expenses	5.14	4.63	3.94	4.15	4.93	22.79
Consumption and stores expense	4.44	7.48	8.23	6.07	6.6	32.82
Operating Expenditure	89.21	116.47	133.02	138.68	143.09	620.47
Provision for doubtful debt	1.60	1.00	-	-	-	2.6
Bad Debts written off	-	1.73	4.84	-	0.35	6.92
VRS Payment to AAI	20.43	19.98	19.29	18.55	17.89	96.14
Provision for PSF (SC) disallowance	9.75	-	13.59	-	-	23.34
Working capital Interest	6.31	30.84	18.51	6.41	9.35	71.42
Financing charges	9.34	10.79	29.12	38.02	41.14	128.41
Loss on scrapping of assets	245.48	2.35	1.75	-	(1.24)	248.34
Collection charges over DF	3.05	10.71	6.13	10.54	2.72	33.15
CSR Cost	0.04	0.33	2.95	0.85	-	4.17
Exchange gain or loss	12.97	14.89	(19.53)	0.24	0.42	8.99
CWIP written off	-	13.54	-	-	-	13.54
Investment written off	-	-	0.03	-	-	0.03
Total Operation and maintenance Expenses	**868.01**	**699.58**	**751.61**	**791.25**	**886.96**	**3,997.41**

Table 74: Difference between projected expenses and O&M actual expenses incurred during the Second Control Period – (C)

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Employee Cost	0.04	6.73	(11.89)	5.36	20.86	21.10
Utilities Expenses	-	78.57	96.25	88.37	103.70	366.89
Repairs and Maintenance	-	54.96	47.38	49.00	29.29	180.63
Rents, Rates and Taxes	-	36.43	10.22	(7.03)	(44.78)	(5.16)
Advertisement Expenses	-	0.93	(2.29)	(1.41)	(1.42)	(4.19)
Administrative Expenses	0.04	(35.30)	(23.97)	(10.94)	(24.16)	(94.33)
AOA Fees	-	(0.67)	(0.62)	(0.62)	(1.38)	(3.29)
Insurance Expenses	-	3.67	4.56	4.56	4.23	17.02
Consumption and stores expense	-	(2.47)	(2.58)	0.30	0.59	(4.16)
Operating Expenditure	0.01	(3.50)	(6.80)	4.64	19.90	14.25
Provision for doubtful debt	-	(1.00)	-	-	-	(1.00)
Bad Debts written off	-	(1.73)	(4.84)	-	(0.35)	(6.92)
VRS Payment to AAI	-	(0.01)	-	-	-	(0.01)
Provision for PSF (SC) disallowance	-	10.72	(1.80)	12.97	14.27	36.16
Working capital Interest	-	(24.54)	(12.21)	(0.11)	(3.05)	(39.92)
Financing charges	-	(1.45)	30.22	(28.68)	(31.80)	(31.71)
Loss on scrapping of assets	-	(2.35)	(1.75)	-	1.24	(2.86)
Collection charges over DF	-	(10.71)	(6.13)	(10.54)	(2.72)	(30.10)
CSR Cost	(0.04)	(0.33)	(2.95)	(0.85)	-	(4.17)
Exchange gain or loss	(12.97)	(14.89)	19.53	(0.24)	(0.42)	(8.99)
CWIP written off	-	(13.54)	-	-	-	(13.54)
Investment written off	-	-	(0.03)	-	-	(0.03)
Total Operation and maintenance Expenses	**(12.95)**	**79.51**	**130.07**	**104.57**	**83.91**	**385.11**

Note:

a) As per AERA Decision 12.d of Order No. 13/2016-17 (for Second Control Period), CSR costs have been excluded from operation and maintenance expenses of MIAL by AERA and may not appear as in the projections table.
b) As per Order No. 13/2016-17 (MIAL tariff order for Second Control Period), AERA has excluded the expense arising from exchange rate fluctuation, accordingly it may not appear as part of the projected expenses.

3.3 Cost reduction measures adopted by MIAL[5]

The key operational efficiency improvement initiatives that MIAL management has declared to have undertaken during Second Control Period has been tabulated in Table 75 below:

Table 75: Cost Saving and Efficiency Measures Implemented by MIAL

S. No	Title of Project	Year	Estimated Annual Saving (₹ in crore)
1.	Laying of chilled water line from Terminal 1-C to Terminal 1-A AHU	2016-17	1.03
2.	Configuration of VFD and Chilled water line actuator / return air temperature through signal converter at 10 AHUs in T1B.	2016-17	0.10
3.	Replacement of cooling tower Aluminium fan blades with FRP blades	2017-18	0.42
4.	Retrofitting of energy efficient pumps	2017-18	0.12
5.	Replacement of Conventional Lights with LEDs	2017-18	8.17
6.	Optimisation of chiller operation	2017-18	3.23
7.	Installation of HVLS fans at T1	2017-18	0.08
8.	Scheduling of lights based on flight schedule	2017-18	0.43
9.	Two additional VDGS units provided for stands at V8L & V17L with available T3 units instead of T1 units.	2017-18	0.70
10.	Replacement of old UPS with new UPS system with improved power factor	2018-19	0.53
11.	42 no VDGS units have been upgraded by in house engineering to meet the regulatory requirements.	2018-19	4.15
12.	Explored and purchased spares from local market instead of purchasing from OEM's	2017-19	0.40
13.	Two additional VDGS units have been upgraded and commissioned on stand G4L & G4R. (These units were previously scrapped in 2008, but recently after proper in-house engineering and replacement of few faulty parts, it was successfully upgraded and commissioned.)	2019-20	0.40
14.	Installation of solar panels	2015-20	4.55
15.	Procuring power through open access	2017-20	24.93
	Total		**49.24**

[5] Source: Management information

3.4 Trend analysis of inflation-adjusted expenses

To have a fair Trend Analysis, we have calculated and analysed the expenses after adjusting the nominal amount by general price level changes over time to remove inflationary effect.

Real amount of expenses can be derived by dividing the relevant nominal amount of expenses by the appropriate price index of the current year in relation to the price index of base year. By doing this, we get the amount of expenses net of any changes in the general price level and real increase or decrease in expenses over the period from the base year (base year taken FY15) can be worked out.

Wholesale Price Index (WPI) is used as the price index for this purpose and it is taken from the website of Office of the Economic Adviser - Government of India, Ministry of Commerce & Industry.

Formula for calculating the real amount (inflation adjusted) of expenses is mentioned below:

Formula for calculating inflation adjusted expense:

$$= \frac{Nominal\ Expense\ of\ Current\ Year}{WPI\ of\ Current\ Year} \times WPI\ of\ Base\ Year$$

The Index for the Years used are as under:

Table 76: Index numbers used for inflation adjustment

Particulars	FY 15	FY 16	FY 17	FY 18
Index for the Year	100.0	109.7	111.6	114.9

The following work steps have been followed for this exercise:

1. The increase in the annual expense for the Second Control Period was compared to the increase in the scale of operations to eliminate its effect in the increase of total spend
2. The per PAX/per ATM costs year on year were then compared and for any increase/decrease beyond 25% of the immediate previous year, a root-cause analysis was performed to assess other factors like improvement plan implementation, increase in wage rates, one-time expenses, etc. attributing to the upward trend or downward trend in expenses if any.

3.4.1 Operation and maintenance expenses submitted by MIAL

3.4.1.1 Break up of operation and maintenance cost incurred at CSI Airport for the Second Control Period (FY 14 to FY 18) has been provided in the table below based on the information submitted by MIAL:

Table 77: Operation and maintenance Cost during Second Control Period

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18
Rents, Rates & Taxes	28	5	32	50
Advertisement Expense	6	7	9	8
Other Administrative Expenses	58	106	88	79
Provision for Bad Debts	2	1	-	-
Bad debts written off	-	2	5	-
Loss on scrapping of Asset	245	2	2	-

Particulars	FY 15	FY 16	FY 17	FY 18
Exchange gain and loss	13	15	-20	-
(A) - Administrative Expense - Sub total	**352**	**138**	**116**	**137**
(B) AOA Fees	8	9	9	9
Collection charges over DF	3	11	6	11
Working Capital Interest	6	31	19	6
Financing charges	9	11	29	38
(C) Finance Expense - Sub total	**18**	**53**	**54**	**55**
(D) Employee Cost	146	161	197	198
Utilities Expenses	104	99	93	113
Repair & Maintenance Expense	110	78	102	111
Insurance Expense	5	5	4	4
Consumable stores	4	7	8	6
Operating cost	89	116	133	139
Provision for PSF (exp)	10	-	14	-
(E) Operating Expense - Sub total	**322**	**305**	**354**	**373**
VRS Expenses	20	20	19	19
CSR cost	-	-	3	1
CWIP - Written off	-	14	0	0
(F) Other Expenses - Sub total	**20**	**34**	**22**	**20**
(G) – Total Expenses (A) + (B) + (C) + (D) + (E) + (F)	**866**	**700**	**752**	**792**

3.4.1.2 For the purpose of trend analyses we have excluded expenses that are non-recurring and those that are insensitive to price indices. Such items include -

- NA Tax: Non-Agricultural taxes is not paid at a constant rate on annual basis. There have been changes in the computation of this tax by the local authorities resulting in payments of arrear taxes which do not correspond to movements in price indices.
- AOA Fee: Airport Operator Assistance Fee is a constant sum of money in foreign currency and adjusted to the CPI of a foreign country.
- PSF (SC) Disallowance: Expense incurred out of Passenger Service Fee (Security Component) disallowed is to be borne by MIAL. This is not a recurring item and depends on the nature of expenses incurred out of PSF during a given year.
- Capital Work in Progress / Investments / Receivables written off: These items do not correspond to any trend and are based on event occurring during a given year.
- Loss on sale of Assets: These items do not correspond to any trend and are based on event occurring during a given year.
- Exchange Gain / Loss: Exchange gain / loss is based on the movement of the exchange rate and would be material only in the existence of a significant foreign currency exposure.
- Finance charges is based on the fund-raising activities of the company and are not sensitive to operational aspects or price levels.
- CWIP written off and CSR expenses that are either non-recurring or discretionary expenses.

3.4.2 Human resource cost

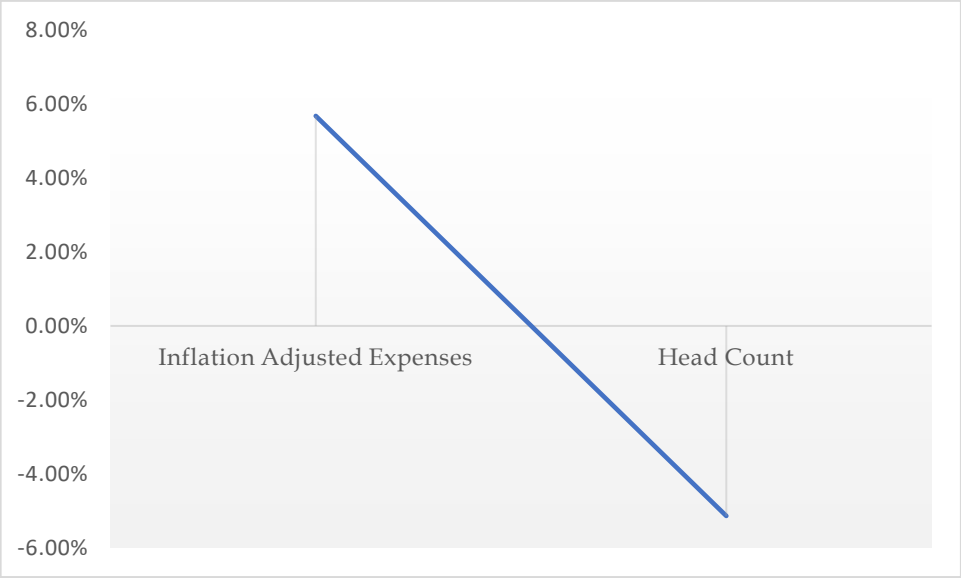
(₹ crores)

Table 78: Trends in Manpower Expenses

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Man-Power Expenses	146	161	197	198	
Inflation Index*	100	109.7	111.6	114.9	
Inflation Adjusted Expenses	146	147	177	172	5.61%
Headcount	1,428	1,355	1,315	1,219	-5.14%

**Refer Table 76 for inflation index*

Figure 4: MAN-POWER COUNT / TOTAL COST



3.4.2.1 It can be seen from the above charter that the CAGR of manpower count during the Second Control Period is -5% whereas the CAGR of manpower expenses shows a CAGR of 5.68%. According to MIAL, the reasons for the same were

- In FY 15 construction of Terminal 2 was in progress. The total number of employees in Project team in FY 15 was 128 and salary paid was considered as part of project cost. However, headcount number included such employees. The headcount of the Project team has been reduced to zero in FY 19 in a phased manner.

- Salary paid to inline security department in FY15 and FY16 was considered as part of PSF expenses under operational salary expenses. However, the headcount in FY15 of 290 and FY 16 of 284 were included in total employee's headcount.

Effect of the above two are demonstrated in the Table below:

Total no. of employees in FY 15 as submitted by MIAL	1428
Less: Adjustment for project team	128
Less: Adjustment for Inline Security	290
Effective no. of employees in FY 15	1010

- Customer Service & Quality – Number of employee declined from 136 in FY 15 to 107 in FY 19 due to streamlining of customer service and quality team.
- Engineering & Maintenance – Number of employees declined from 96 in FY 15 to 65 in FY 19 due to streamlining of E&M Operations.
- Project Operations Team – Number of employees increased from zero in FY 15 to 35 in FY 19 due to project operational team which handles day to day project related activities.
- Guest Relation: Number of employees increased from zero in FY 15 to 27 in FY 19 due to increased business requirement.

MANPOWER PERFORMANCE INDICATORS

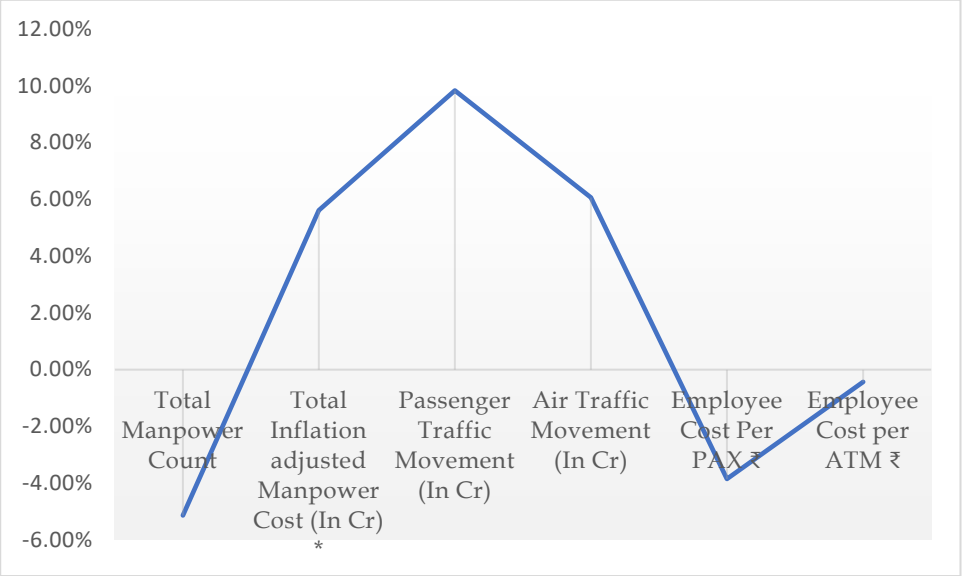
Table 79: Manpower performance indicators

Functions	FY 15	FY 16	FY 17	FY 18	CAGR
Total Manpower Count	1,428	1,355	1,315	1,219	-5.14%
Total Inflation adjusted Manpower Cost (In Cr) *	146	147	177	172	5.61%
Passenger Traffic Movement (In Cr)	3.66	4.17	4.52	4.85	9.84%
Air Traffic Movement (In Cr)	0.0269	0.0297	0.0305	0.0321	6.07%
Employee Cost Per PAX ₹	39.89	35.25	39.16	35.46	-3.85%
Employee Cost per ATM ₹	5,428	4,949	5,803	5,358	-0.43%

**Refer Table 76 for Inflation Index*

The above table shows that the increase in cost of manpower catering to passengers/ air traffic movements (ATM) is attributable to the corresponding increase in number of PAX and ATM. Further, it is to be noted that the cost of employee per PAX and per ATM shows a decreasing trend over the Second Control Period, thereby emphasizing efficiency in the airport operations at MIAL.

Figure 5: CAGR MOVEMENT OF MANPOWER PERFORMANCE INDICATORS



3.4.3 Operating expenses

Table 80: Trends in Operating Expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Utilities Expenses (Power + Water)	104	99	93	113	2.81%
Repair & Maintenance	110	78	102	111	0.30%
Insurance Expense	5	5	4	4	-7.17%
Consumable stores	4	7	8	6	14.47%
Cleaning contracts	37	50	59	60	17.10%
Security Contract	14	17	33	29	26.30%
Horticulture Expenses	5	6	7	8	14.45%
Inter Terminal Coaches	10	8	3	-	-100.00%
Trolley Contracts	10	9	13	14	10.59%
Other operating contracts	13	15	18	28	31.10%
Disallowance from PSF (SC) borne by MIAL	10	11	14	-	
Total	**322**	**305**	**354**	**373**	**5.02%**
Non-recurring / non trend expenses					

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
PSF expense disallowed	-10	-11	-14	-	
Operating Expenses (net of non-recurring items)	**312**	**294**	**340**	**373**	**6.13%**
Inflation Index (Refer Table 76 for index)	100	109.7	111.6	114.9	
Inflation Adjusted Expenses	**312**	**268**	**305**	**325**	**1.37%**

*Other operating cost includes standby medical support, golf cart services, passenger management services, waste disposal etc.

Table 81: Inflation adjusted operating Expenses of MIAL

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Utilities Expenses (Power + Water)	104	90	83	98	-1.85%
Repair & Maintenance	110	71	91	97	-4.24%
Insurance Expense	5	5	4	3	-11.37%
Consumable stores	4	6	7	5	9.29%
Cleaning contracts	37	46	53	52	11.80%
Security Contract	14	16	29	25	20.59%
Horticulture Expenses	5	6	6	7	9.27%
Inter Terminal Coaches	10	7	3	-	-100.00%
Trolley Contracts	10	9	12	12	5.59%
Other operating contracts	13	14	16	25	25.17%
Total	**312**	**268**	**305**	**325**	**1.37%**

a. UTILITIES COST

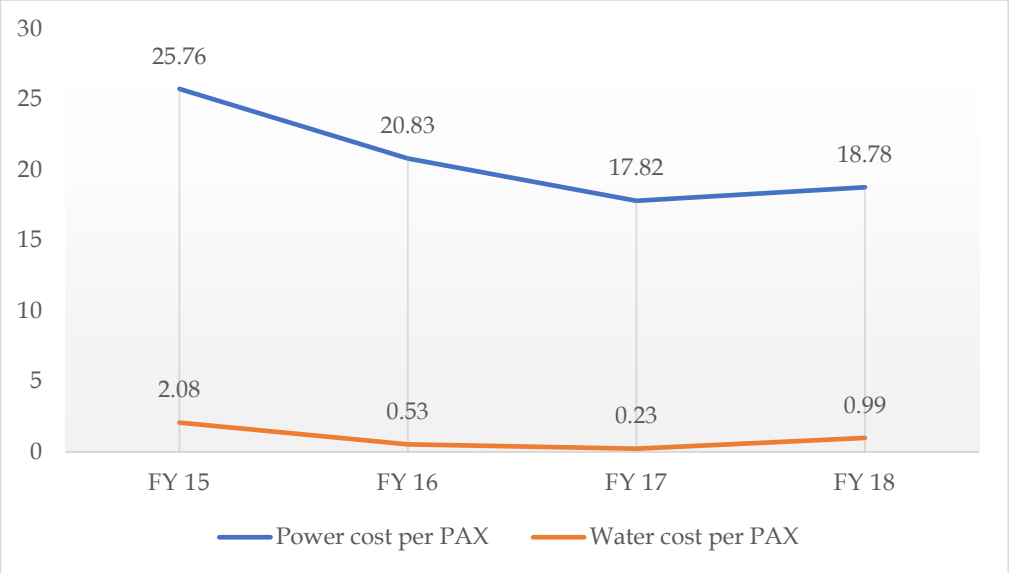
Table 82: Trend Analysis of Power Cost

(₹ crores, unless otherwise specified)

S. No	Particulars	FY 15	FY 16	FY 17	FY 18
(a)	Electricity Charges (Gross)	138.50	151.29	150.87	173.67
(b)	Less: Recoveries	(32)	(56)	(61)	(69)
(c)	Net Consumption	106.5	95.29	89.87	104.67
(d)	Gross consumption units (kwH crore) units	14.54	15.65	16.66	17.10
(e)	Cost per unit (kwH crore) units (a) / (d)	9.53	9.67	9.06	10.16
(f)	Water Charges	9.84	6.44	6.19	10.26
(g)	Less: Recoveries	(2.22)	(4.03)	(5.05)	(4.76)
(h)	Net Water consumption (f) – (g)	7.62	2.41	1.14	5.50
(i)	Piped Natural Gas	1.15	1.18	1.83	2.25
(j)	Less: Recoveries	(1.42)	(2.27)	(1.89)	(2.02)
(k)	Net Piped Natural Gas (i) – (j)	(0.27)	(1.09)	(0.06)	0.23
(l)	Fuel and Lubes	1.74	1.74	1.82	1.93
(m)	Total Utility Cost (c) + (h) + (k) + (l)	103.38	98.35	92.77	112.33
(n)	Inflation adjusted power cost	94.29	86.86	80.53	91.10
(o)	Inflation adjusted water cost	7.62	2.20	1.02	4.79

Utility costs are capacity-based costs that are more sensitive to changes in the capacity related parameters than to passenger movements. Gross cost of power reflects the additional cost arising from the complete operation of the new Terminal 2 during the year 2015-16. The increase in the gross power cost for the year 2017-18 was on account of levy of "Cross Subsidy Surcharge" (CSS). The effects of efficiency initiatives adopted by MIAL have been shown in section 3.3 of this Report. This shows efficiency in utility costs on a per passenger basis, which is also depicted in the chart below.

Figure 6: Power cost and Water Cost per PAX



b. Repairs and maintenance expenses

Table 83: Trends in repairs and maintenance expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18
Building	53.56	12.65	20.59	21.98
Runway/Taxiway/Apron	4.10	4.16	4.06	3.11
Plant and Equipment	51.08	60.31	75.83	84.78
Vehicles	0.83	0.84	0.87	1.03
Furniture	0.21	0.28	0.17	0.31
Total R&M	**109.78**	**78.24**	**101.52**	**111.21**

Repairs and Maintenance – Building: R&M Building includes expense incurred for repairs and maintenance of buildings other than airside buildings, such as passenger terminal, cargo terminal, landside structures etc.

Repairs and Maintenance – Airside: Includes expenses incurred for towards repairs and maintenance of airside structures such as apron, taxiways, runways which are revenue in nature.

Repairs and Maintenance – Plant and Equipment: Includes expenses incurred for maintenance of equipment in the airport including HVAC, electrical installations and equipment, DG sets, aerobridges, computer hardware, SAP (support, AMC etc.), TMRS frequency allotment charges, IT hardware maintenance, escalator/lifts/travellators, sweeping machines etc.

Repairs and Maintenance - Vehicles: Includes expenses incurred for maintenance of four wheelers and two wheelers used on the land side and airside.

Repairs and Maintenance – Furniture: Includes expenses incurred for maintenance of chairs, tables, partitions, temporary structures etc., located inside the airport.

i Repairs and Maintenance – Buildings

Table 84: Baseline cost for Repairs and Maintenance – Buildings

(₹ crore unless otherwise specified)

Description	FY 15	FY 16	FY 17	FY 18
Total Cost on R&M - Building	54	13	21	22
Less: Unbudgeted Expenses/ Non-recurring Expenses**	(37)	-	-	-
Total Recurring Cost	16	13	21	22
WPI Index	100	109.7	111.6	114.9
Base Year Assignment	0	1	2	3
Total Inflation Adjusted Recurring Cost* (A)	16.26	11.53	18.45	19.13
Closing Net Block of Assets	6,512	7,568	7,733	8,077
% Increase		16.22%	2.18%	4.45%
Increase in cost adjusted to Increase in Net Block of Assets (B)	16.00	18.90	19.31	20.17

*Refer Table 76 for inflation index
**Non-recurring expenses include expenses incurred in repairing the cargo terminal complex of ₹ 27 crores and airside civil works of ₹ 10 crores.

As the repair and maintenance cost are not variable to the operations of the airport, the baseline costs aren't analyzed on a per PAX level.

The cost of repairs and maintenance is affected by the quantum of asset under management. Accordingly, the growth percentage in the gross block of fixed assets has been applied to the normalized cost. The increased cost computed using the incremental percentage of gross block of building could be taken to represent the optimum cost levels.

When comparing the optimum cost level (as indicated in B of the above table) to the actual cost (as indicated in A), it was noted that the actual cost level of the company was lower than the optimum level denoting efficiency in managing the costs.

ii Repairs and Maintenance – Runway/Taxiways/Apron

Expenses booked under this head include redrawing of markings, netting of drains, maintenance of civil work on the airside, etc.

Table 85: Baseline cost of repairs and maintenance - runway/taxiways/apron

(₹ crores unless otherwise stated)

Description	FY 15	FY 16	FY 17	FY 18
Total Cost on R&M – Runway/Taxiways/Apron	4.10	4.16	4.06	3.11
Less: Unbudgeted Expenses/ Non-recurring Expenses	-	-	-	-
Total Recurring Cost	4.10	4.16	4.06	3.11
WPI Index	100	109.7	111.6	114.9
Base Year Assignment	0	1	2	3
Total Inflation Adjusted Recurring Cost* (A)	4.10	3.79	3.64	2.71
Closing Net Block of Assets	1,229	1,744	2,009	2,181
% Increase		41.90%	15.19%	8.56%
Increase in cost adjusted to Increase in Net Block of Assets (B)	4.10	5.82	4.37	3.95

*****Refer Table 76 for inflation index

As the repair and maintenance cost are not variable to the operations of the airport, the baseline costs aren't analyzed on a per PAX level.

The cost of repairs and maintenance is affected by the quantum of asset under management. Accordingly, the growth percentage in the gross block of fixed assets of the relevant block has been applied to the normalized cost. The increased cost computed using the incremental percentage of gross block of runways/apron/taxiways could be taken to represent the optimum cost levels.

When comparing the optimum cost level (as indicated in B of the above table) to the actual cost (as indicated in A), it was noted that the actual cost level of the company was lower than the optimum level denoting efficiency in managing costs.

iii Repairs and maintenance – Plant and Equipment

Table 86: Baseline cost of repairs and maintenance - plant and equipment

(₹ crores unless otherwise stated)

Description	FY 15	FY 16	FY 17	FY 18
Total Cost on R&M – Plant & Equipment	51	60	76	85
Less: Unbudgeted Expenses/ Non-recurring Expenses	-	-	-	-
Total Recurring Cost	51	60	76	85
WPI Index	100	109.7	111.6	114.9
Base Year Assignment	0	1	2	3
Total Inflation adjusted recurring Cost* (A)	51	55	68	74
Closing Net Block of Assets	1,526	1,974	2,018	2,204
% Increase		29%	2%	9%
Increase in cost adjusted to Increase in Net Block of Assets (B)	51	66	62	83

*****Refer Table 76 for inflation index

As the repair and maintenance cost are not variable to the operations of the airport, the baseline costs aren't analyzed on a per PAX level.

The cost of repairs and maintenance is affected by the quantum of asset under management. Accordingly, the growth percentage in the gross block of fixed assets of the relevant block has been applied to the normalized cost. The increased cost computed using the incremental percentage of gross block of plant and equipment could be taken to represent the optimum cost levels.

When comparing the optimum cost level (as indicated in B of the above table) to the actual cost (as indicated in A), it was noted that the actual cost level of the company was lower than the optimum level denoting efficiency in managing costs during FY 16.

c. Insurance cost

Table 87: Insurance Cost

(₹ crores unless otherwise stated)

Description	FY 15	FY 16	FY 17	FY 18	CAGR
Industrial All risk	2.46	2.02	1.66	2.43	
Airport Operating Liability	1.31	1.45	1.41	1.19	
Terrorism policy	1.36	1.07	0.80	0.52	
Other	0.11	0.18	0.13	0.09	
Total	5.24	4.72	4.00	4.23	(6.89%)

As it can be seen from the above table, there has been a decrease of 6.89% (CAGR). This can be attributed to the fall in the insurance premium rates incurred by MIAL.

d. Cleaning costs

The operations of the airport require deployment of housekeeping services at three different locations, a) Passenger Terminal Building b) Airside and c) Other Landside/Cityside Buildings. For Second Control Period, the company had incurred ₹ 206 Crores towards housekeeping services availed from major vendors at various locations are as below:

Table 88: Cleaning activities

Location	Description of The Activities
Airside Operations	Bird Chasers, Supervisor and Wild-Life Control Services
	Airside Pavement Cleaning for Taxiways etc.
T1 Terminal Operations	Housekeeping Services, pest control, façade cleaning
T2 Terminal Operations	Housekeeping Services, pest control, façade cleaning
Facilities & Administration	Environmental Services and Office Support Staff for Corporate Office
	House Keeping Services Land/ City Side
	Support Staff for Guest House

Description	FY 15	FY 16	FY 17	FY 18	CAGR
Cleaning contracts	37	50	59	60	17.10%

From the above table it can be noticed that expenses on cleaning contracts have grown at 17.10% CAGR. According to MIAL, the reason for the increase are as below:

- Domestic operations commenced at T2 from 1st Oct 2015 and operations in Phase IV areas commenced from 1st April 2016.
- Also, there was revision in manpower rates for which MIAL had paid additional **₹ 3.08 crores** in FY 16
- During FY 16 MIAL incurred expenditure on cleaning of Mithi River channel of **₹ 7.18 crores.** The above cleaning of Mithi River was undertaken as a safety precaution, as the river was passing by and through the airport in some areas. Accumulation of silt in the river channels close to airport may increase the risk of bird strikes by creating habitats, flooding of airfields and ground subsidence.

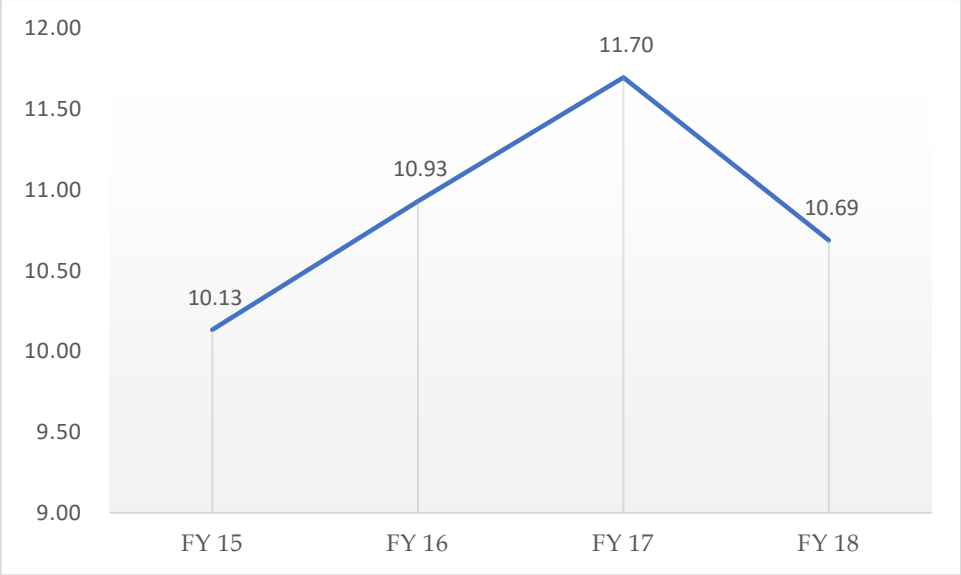
Performance Indicators

Table 89: Cleaning cost per PAX

₹ crores

Particulars	FY 15	FY 16	FY 17	FY 18
Cleaning contracts	37.09	50.00	59.00	59.56
WPI	100	109.7	111.6	114.9
Inflation adjusted cost	37.09	45.58	52.87	51.84
Passenger traffic (crore)	3.66	4.17	4.52	4.85
Cleaning cost per PAX	10.13	10.93	11.70	10.69

Figure 7: Trends in cleaning costs per PAX



It can be noticed that the trend in cleaning contract costs correspond to the capacity changes at the airport vide operation of a new terminal and are thereby operating at efficient levels.

e. Security contracts

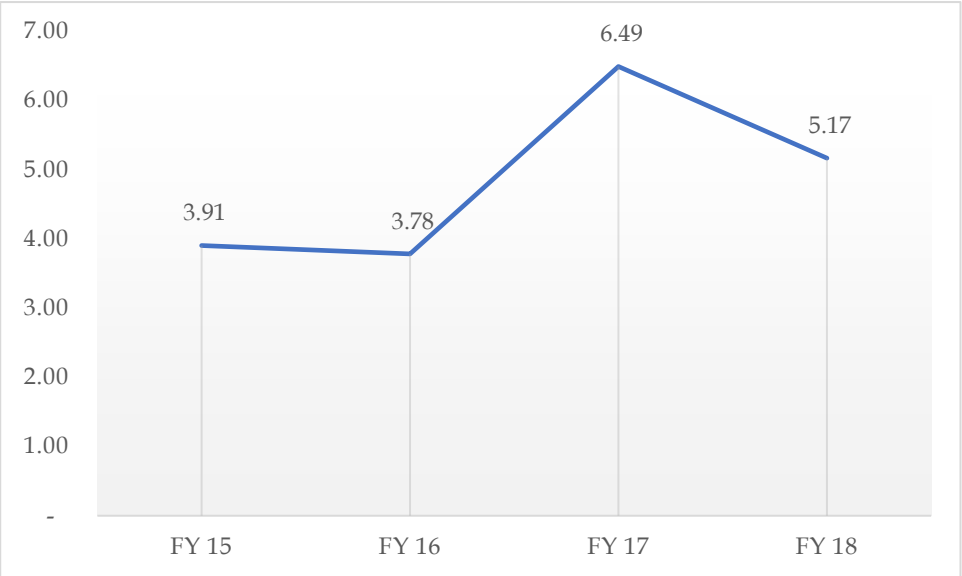
MIAL engages security guards at the below key activities:

(a) Multi-level car park
(b) Traffic management on landside of terminal 1 & 2
(c) Air Cargo complex
(d) Security for land parcels
(e) Security for corporate office

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Security contracts	14	17	33	29	
WPI	100	109.7	111.6	114.9	
Inflation adjusted cost	14	15.78	29.35	25.07	
Passenger traffic (crore)	3.66	4.17	4.52	4.85	
Security cost per PAX	3.91	3.78	6.49	5.17	9.78%

Figure 8: Security cost per PAX



It can be seen from the above table that there is an upward trend in the security expenses during 2016-17. According to MIAL this was on account of security expenses incurred for security of T1C hotel ₹ 10 crores in 2016-17 which was gradually reduced in the subsequent years.

f. Horticulture expenses

Table 90: Trends in Horticulture expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR %
Horticulture	5	6	7	8	17%
WPI	100	109.7	111.6	114.9	
Inflation Adjusted Expense	5.00	5.47	6.27	6.96	12%

The increase in horticulture expenses can be attributable to the upward trends in the general price level and full operation of new terminal 2 building with additional horticultural features.

g. Inter-terminal coaches

Table 91: Trends in Inter terminal coach operating expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR %
Inter terminal coaches	10	8	3	-	-100%
WPI	100	109.7	111.6	114.9	
Inflation adjusted cost	10.00	7.29	2.69	-	-100%

As it can be noticed from the above table, inter terminal coach operating expenses was gradually reducing and completely nil in 2017-18. According to MIAL the reason was discontinuation of inter terminal coach operation from May 2016.

h. Trolley contracts

Table 92: Trends in Trolley Management Cost

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR %
Trolley contracts	10.27	9.38	12.89	13.88	10.56%
WPI	100	109.7	111.6	114.9	
Inflation adjusted cost	10.27	8.55	11.55	12.08	5.56%

As it can be seen from the table above, an increasing trend can be observed in the trolley management costs. According to MIAL, the reason for the such trend is:

- For the year 2016-2017, the trolley contract was revised for both T1 and T2 wherein the Manpower count for T1 was reduced from 143 to 93, i.e. by 50 workers and the T2 Manpower count had to be increased by 50 workers from 230 to 280. The total Manpower count in T2 was finalized at 338 workers (i.e. 58 additional workers) as per study and recommendation by HR/IR for the total count of trolley workers is to be maintained at 325-excluding supervisors and managers. This count was derived keeping in mind the difference in layout, topography and increased levels of vertical circulation at new T2 as compared to T1 this led to increase in the contract value from 2016-17 onwards

- Increase in the wages by 6% to 7% every year also leads to increase in cost.

Considering the increasing trend in Trolley Management costs (largely due to increase in manpower costs), MIAL may explore opportunities such as lining up a revenue contract with the vendor, for optimising further the trolley expenses.

3.4.4 Administrative expenses

(₹ crores)

Table 93: Trend Analysis of Administrative Expenses

Particulars	FY 15	FY 16	FY 17	FY 18	CAGR
Rents, Rates & Taxes	28	5	32	50	
Advertisement Expense	6	7	9	8	
Other Administrative Expenses	58	106	88	79	
Provision for Bad Debts	2	1	-	-	
Bad debts written off	-	2	5	-	
Loss on scrapping of Asset	245	2	2	-	
Exchange gain and loss	13	15	(20)	-	
Total Administrative Expenses	**352**	**138**	**116**	**137**	
Non-recurring /non-trend expenses					
Less: NA Tax	(6)	(6)	(6)	(18)	
Property Tax	(8)	*13	(13)	(16)	
Loss on scrapping of Asset	(245)	(2)	(2)	-	
Bad debts written off	-	(2)	(5)	-	
Exchange gain and loss	(13)	(15)	20	-	
Admin. Exp. excluding non-recurring items	**80**	**126**	**110**	**103**	

Inflation Index	100	109.7	111.6	114.9	
Inflation Adjusted Expenses	80	115	99	90	3.8%

*Property tax was negative during 2015-16 due to provision reversal

a. Rent, rates and taxes

Table 94: Trends in Rent, rates and taxes

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18
Rent, rates and taxes	28	5	32	50
Less: Non-recurring items/items that are insensitive to price level changes or operation changes				
Non-agricultural tax	(6)	(6)	(6)	(18)
Property tax	(8)	*13	(13)	(16)
Rent, rates and taxes	14	18	13	16

Major expenses booked under rent, rates and taxes include

- Rental expenditure incurred towards customs offices
- Rental expenditure incurred towards guest houses/transit houses
- Rental expenditure incurred for housing relocated AAI staff
- Non-Agricultural Tax and property taxes
- Lease rent for vehicles
- Consent Fees paid to the pollution control board for license renewal

b. Other administrative expenses

Table 95: Trend analysis of other administrative expenses

(₹ crores)

Particulars	FY 15	FY 16	FY 17	FY 18
Legal Fees	16	23	20	16
Professional Fees	22	56	39	25
Travelling and lodging	8	13	14	23
Conveyance	3	3	3	4
Hospitality	2	3	2	2
Other	8	8	8	9
Total	59	106	86	79

- Increased Professional Fees in FY 2015-16 at ₹ 56 crores as compared to FY 2014-15 of ₹ 22 crores is due to restructuring related fee of ₹ 22 crores paid to Yes Bank and Axis Bank together with consultancy charges paid for land settlement of ₹ 11 crores.

- During FY 17 MIAL had incurred extraordinary expenditure on Air Side study and radar simulation while no such expenses were incurred during FY 18.

- During FY 15 part of Travelling expenses of Chairman and MD's were capitalized as a part of project cost, since they were actively involved in the monitoring and coming up of the project. On completion of the project the entire travelling expense were debited to expense rather than being capitalised.

3.5 Chapter summary

The analysis of the key components of O&M costs shows that while the absolute cost has increased over the duration of the Second Control Period during to increased passenger traffic and ramping up of Terminal 2 operations, MIAL has been able to improve the efficiency of its operations, as evidenced by a lower growth or even decrease in costs on a per passenger basis.

- Manpower costs: While passenger traffic has registered annual growth of 9.84%, employee cost per passenger has grown only at annual rate of 3.85%, due to economy of scale and efficiency in operations.
- Utilities Cost: Gross utilities cost has increased due to the operation of all phases of the new Terminal 2
- R&M Buildings: Buildings repairs and maintenance cost was lower than the optimum cost level denoting efficiency in managing the costs.
- R&M Taxiways/runways/Apron: R&M cost of taxiways, runways and apron were stable despite the steady increase in operations
- R&M Plant and Equipment: Incremental trend in R&M – plant and machinery is attributable to ending for defect liability period in respect of equipment in the new Terminal 2. However, the actual cost level of the company was lower than the optimum level denoting efficiency in managing the costs.
- Insurance Costs: Insurance costs have shown a decrease in trend despite the growth in the asset base.
- Cleaning Costs: Cleaning costs have shown an increasing trend due to the operation of all phases of the new Terminal 2 during the control period.
- Security Costs: The increase in the security costs was attributed to passenger traffic growth and operation of all phases of New Terminal 2.
- Horticulture Costs: Increases in horticulture expenses can be attributed to general price level and operation of all phases of the new Terminal 2.
- Inter-terminal Coaches: Inter-terminal coach facility was gradually reduced and discontinued from FY 18
- Trolley Contracts: Increase in the trolley management cost was attributable to deployment of additional personnel at the new Terminal 2.
- Administrative expenses: Rates and taxes were subject to regulatory changes hence were excluded from trend analysis while other administrative expenses showed a decreasing trend.

4 BENCHMARKING OF INTERNATIONAL AND DOMESTIC AIRPORTS

We have conducted a study based on documents available at various fora and have undertaken a two-pronged approach of benchmarking the Delhi and Mumbai airports:

(1) Internal Benchmarking (or Self Benchmarking), wherein the Airport's operating metrics are analysed over a period; and

(2) External Benchmarking (or Peer Benchmarking), wherein the Airport's operating performance has been compared to similar data from other airports, either at a single point in time or over a period.

4.1 Internal benchmarking

Under the Internal Benchmarking methodology, an Airport's operating metrics is evaluated over a time period. The Internal Benchmarking approach is less complex to analyse and comprehend because the number of variables that change at an airport over the period is limited.

4.1.1 Internal benchmarking of MIAL's operating expenses

The following work steps were used for the purpose of Internal benchmarking at MIAL

The following costs of MIAL were analyzed over the time period within MIAL

- Total Terminal Maintenance/Operating Cost comprising
    - Utilities Cost
    - Repair and Maintenance Cost
    - Housekeeping and Manpower Services
    - Insurance Costs
    - Cost of Consumables
    - Manpower Hire Charges
    - Security Expenses
- Total Administrative and General Expense comprising
    - Rent, Rates and Taxes (Excluding Property Tax)
    - Professional and Consultancy expenses
    - Printing and Stationery Expenses
    - Travelling, Conveyance and Chartering Costs
    - Communication Costs
    - Office Maintenance
    - Advertising and Sales Promotion
    - Corporate Cost Allocation
    - Donations and CSR Costs
    - Other Admin Expenses

- Total Manpower Cost of MIAL

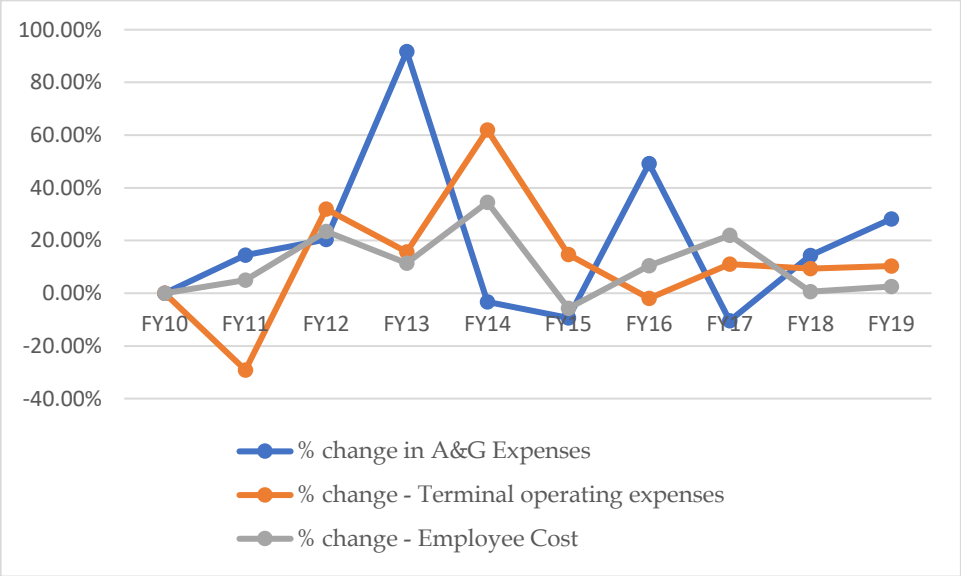
1. Data for First Control Period was collated from the Second Control Period Tariff Order of MIAL (Order No. 13/2016-17/MIAL, Table 4).
2. Data for Second Control Period was collated from the Audited Financial Statements of the respective years of MIAL.
3. The percentage change in costs over First & Second Control Periods were analyzed and the probable factors affecting the change in costs were noted.
4. Conclusions were drawn based on the above analysis as to whether MIAL's costs are in line with the probable factors determined as above.

Table 96: Administrative and General, Operating and Employee Costs Trends

(₹ crores)

Particulars	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19
Administrative and General Expenses[6]	54.30	62.12	74.80	143.38	138.71	125.80	187.70	168.10	192.20	246.40
Terminal Operating Expenses[6]	159.56	113.05	149.16	172.60	279.48	320.40	314.20	349.00	381.70	421.20
Employee Cost[6]	79.80	83.78	103.37	115.19	154.94	146.10	161.30	196.70	197.90	202.80
% change in A&G Expenses	-	14.40%	20.41%	91.68%	-3.26%	-9.31%	49.21%	-10.44%	14.34%	28.20%
% change - Terminal operating expenses	-	-29.15%	31.94%	15.71%	61.92%	14.64%	-1.94%	11.08%	9.37%	10.35%
% change - Employee Cost	-	4.99%	23.38%	11.43%	34.51%	-5.71%	10.40%	21.95%	0.61%	2.48%

Figure 9: TOTAL COST MOVEMENT TO OPERATIONS



These costs are further analysed based on the following factors in order to determine the root cause of the trends of movement year-on-year and justify if the change in costs were in line to the change in the following factors:

- Passenger traffic
- Air traffic movement
- Proportion of domestic and international passenger traffic

[6] Table 4 of Order No. 13/2016-17/MIAL and Management information for data up to FY 19

- Management structure and contract outsourcing practices
- Terminal area in operation

Terminal Area under operation

MIAL's new Terminal 2 was inaugurated in a phase-wise manner. The first phase was inaugurated in February 2014 at the end of the control period. Accordingly, the expansion did not have a material impact on the terminal operating cost of First Control Period. Domestic operations commenced at Terminal 2 from 1st Oct 2015 and operations in phase IV areas commenced from 1st April 2016. Accordingly, there was increase in terminal operating expenses and employee costs in FY 14 (as highlighted in Table 95 above).

Figure 10: Trends in Inflation adjusted expenses

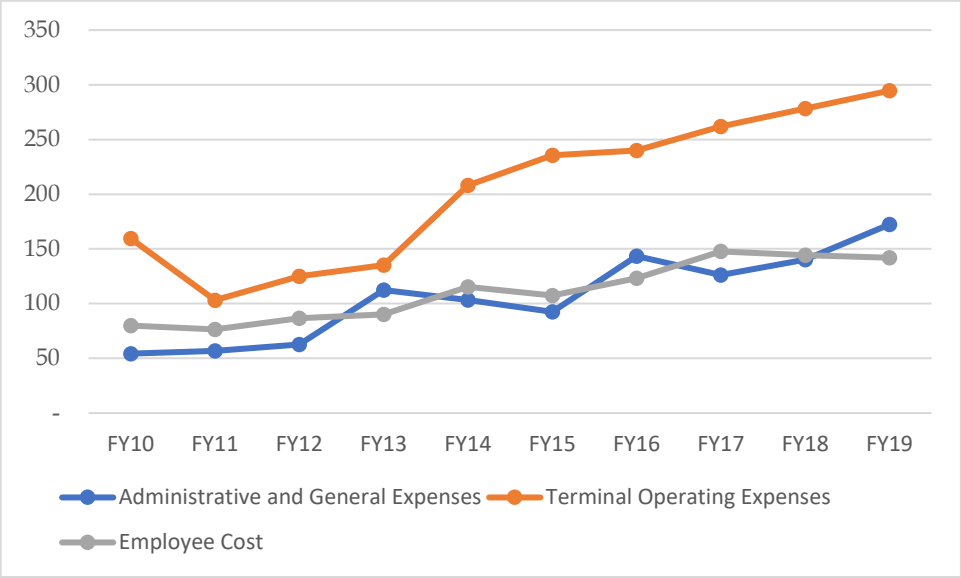


Table 97: Terminal Area under operation

(sq. mtrs)

Terminal	First Control Period[7]	Second Control Period[8]
Terminal 1	103,131	97,621
Old Terminal 2	103,839	[Note 2]
New Terminal 2	[Note 1]	4,48,462
Total	**2,06,970**	**5,46,083**

Notes:

1. New terminal 2 has been excluded as it was opened in February 2014 at the end of the First Control Period.

[7] ICWAI-MARF Report – Annexure 2A to Consulting Paper No. 10/2015-16

[8] Report of M/s. IR Class Systems and Solutions Private Limited submitted to us

2. Old Terminal 2 building has been demolished for completion of section of new terminal building and apron area.

From Table 97 and Figure 10 above, it is possible to relate the rise in operating and other expenditure to the expansion in the terminal area under operation. A continuous rise in the operating expenses could be attributed to the phase-wise opening of the new terminal 2 building.

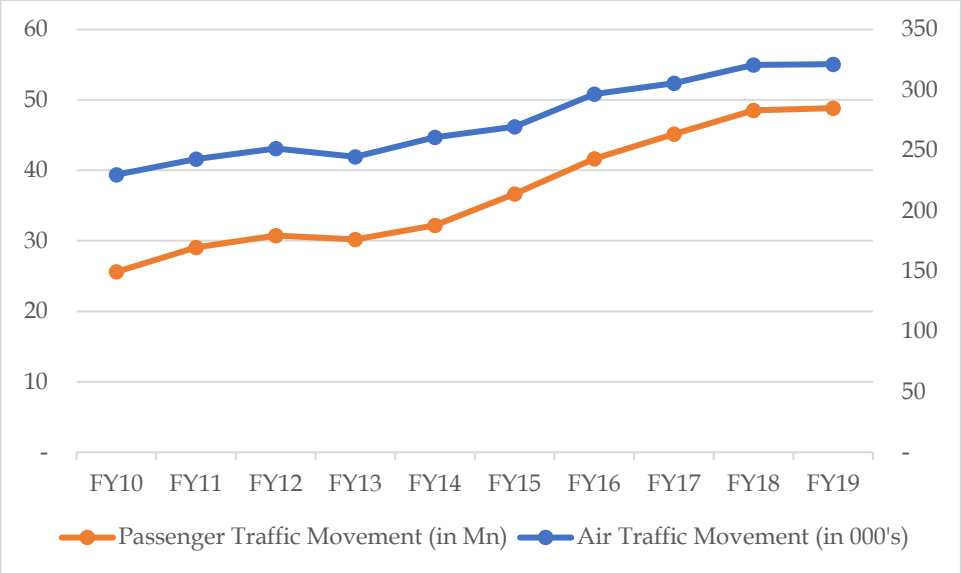
Passenger traffic and Air traffic movement

As per the information gathered, the number of passengers and air traffic operations have increased substantially over the past year and reasonably the airport has maintained a flexible cost structure to balance the need to serve the airlines and passengers while ensuring that its high ASQ rating is maintained.

Table 98: Passenger and Air Traffic Movement

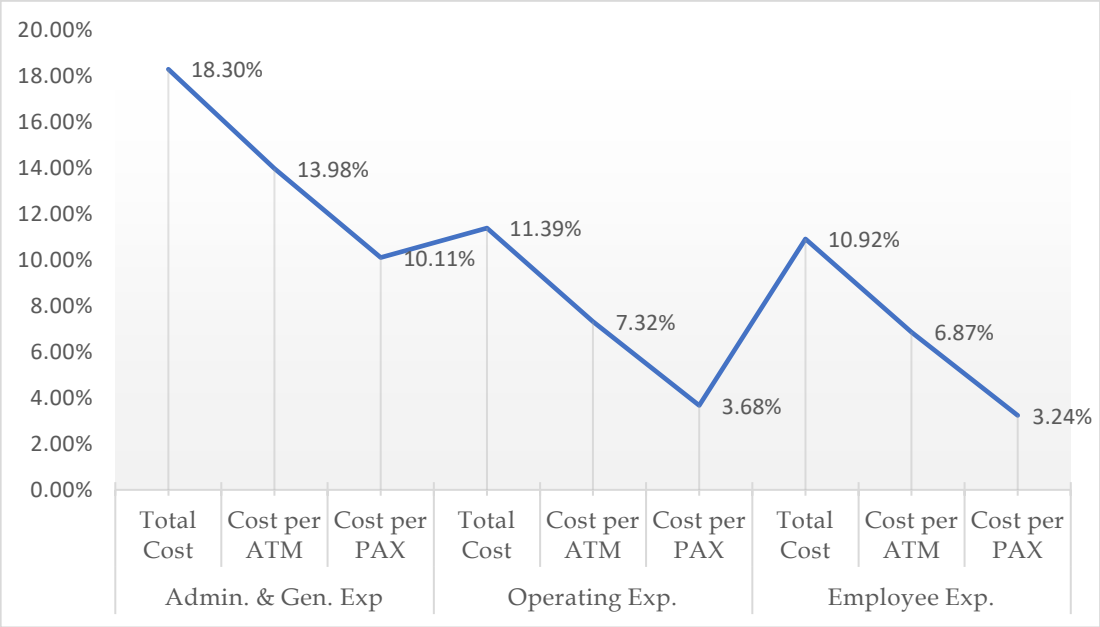
Particulars	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19
Air Traffic Movement ('000s)	229.80	242.65	251.49	244.50	260.66	269.46	296.63	305.47	320.69	321.26
Passenger Traffic (In Million)	25.60	29.08	30.74	30.21	32.22	36.64	41.67	45.16	48.50	48.83

Figure 11: PASSENGER AND AIR TRAFFIC MOVEMENT



The below Figure 12 shows the CAGR movement of the total cost of MIAL versus the CAGR of the cost per PAX and per ATM at MIAL. The figure depicts that the growth of costs per PAX and ATM were at a lower rate comparing the growth rate of the total costs, justifying the growth in operations.

Figure 12: CAGR of Total Cost to CAGR of cost per PAX and cost per ATM



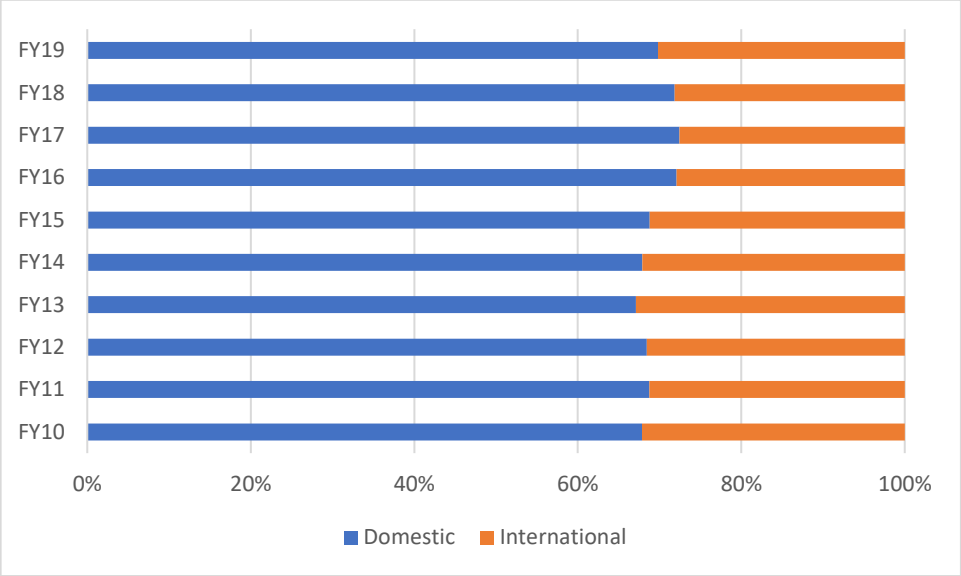
Proportion of domestic and international passenger traffic:

It is generally reckoned that domestic passengers' movements are managed on a relatively low-cost, no-frills and higher gate utilisation model, whereas international passenger movements involve relatively high-cost and amenities, and lower gate capacity utilisation. Therefore, a higher international passenger traffic involves higher cost of operations as well. The chart below provides data on the domestic and international passenger mix over a period. It may be concluded based on this data that the growth in domestic and international passengers is stable across the last 10 years, which is in consonance with the increase in operational expenses (10.5% to 11% on an average from FY 15 to FY 19), as detailed in Table 99.

Table 99: Proportion of Domestic and International Passengers

Passenger Category	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Domestic Passengers	68%	69%	68%	67%	68%	69%	72%	72%	72%	70%	68%
International Passengers	32%	31%	32%	33%	32%	31%	28%	28%	28%	30%	32%

Figure 13: Traffic Composition



4.1.2 Summary

This study has performed an internal benchmark of MIAL's O&M costs by studying the growth trend of various cost components over a period of ten years, to the extent of available data. It is observed that over this period, the rate of increase in all costs has been lower than the growth in passenger traffic (which has increased 25.6 million passengers in FY 10 to 48.83 million in FY 19), and Air Traffic Movements. The only exception to this trend was observed in FY 14, on account of commencement of Terminal 2 operations.

4.2 External benchmarking

External Benchmarking (where the Airports under study are compared with other comparable airports) involves consideration of several dynamic factors that affect the configuration, operating structure and cost basis of an airport. Accordingly, in order to make useful comparisons among airports, it is essential to compare similar sets of businesses operating in similar environments. When comparing one airport to another, some of the influencing factors for benchmarking include[9]

- Passenger volume
- Capacity constraints
- Mix of international and domestic traffic
- Mix of local and transit passengers
- Mix of passenger carrier service (network, low-cost, chartered)
- Type of aircraft
- Mix of passenger versus cargo activity
- Degree of outsourcing
- Range of services provided by the airport (including aircraft stands, Aeronautical bridges)
- Weather conditions (temperature and humidity)
- Geographic location
- Physical size of the airport
- Public transportation access and usage
- Local labour conditions
- Ownership and Governance structure
- Regulatory factors

Beyond the core airside operational functions, different airports have little in common and largely vary from each other in many of the above parameters. The costs of operation, maintenance and administration of one airport vis-à-vis another can also be additionally affected by the following factors[10]:

- Certain airports are required to build facilities that keep arriving and departing international passengers sterile from one another, whereas other airports may not have such requirements and thus can build less complicated terminals with lower capital and operating costs.

- It has been observed that single-till regulated airports have comparatively lower operating costs than dual-till regulated airports. Single-till regulation allows profits derived from airport concession services generating Non-aeronautical revenue to cover its infrastructure cost. This set off is not permitted under dual-till regulation. MIAL is a hybrid-till regulated airport, where the Non-aeronautical revenues are partially allowed to be adjusted to the operating costs.

Post consideration to the above varying factors, it can be concluded that airports are diverse and there is no 'typical' or perfectly comparable airport. With difficulties in identifying a perfect set of comparable airports and certain common concerns like data availability and consistency of the available data, care must be taken when interpreting the results of benchmarking.

With establishing the framework for the external benchmarking exercise undertaken as part of RFP 03/2018-19, the report is detailed in two parts:

[9] Source: ACI Guide to Airport Performance Measures (February 2012)

[10] Source: Intervista Consulting Inc., 2018

1. Domestic Benchmarking where MIAL was compared to other privatised airports within India
2. International Benchmarking where MIAL was compared to Airports outside India

4.2.1 Domestic benchmarking

i. The initial selection criterion for comparable airports was to consider the other privatised airports existing in India. Considering this, we have chosen four other privatised airports in India as set out in the table below:

Table 100: List of Airports for Domestic Benchmarking

S. No	Airports	Major Shareholder	Date of Commencement	Type of Airport Project
1	Cochin International Airport Limited (CIAL)	Government of Kerala	June 1999	Green-Field Project
2	Bengaluru International Airport Limited (BIAL)	Fairfax Financial Holdings Limited	May 2008	Green-Field Project
3	Hyderabad International Airport Limited (HIAL)	GMR Airports Limited	March 2008	Green-Field Project
4	Mumbai International Airport Limited (MIAL)	GVK Airports Limited	April 2006	Brown-Field Project
5	Delhi International Airport Limited (DIAL)	GMR Airports Limited	April 2006	Brown- Field Project

ii. For benchmarking of the Domestic airports, the total Operation and Maintenance costs are compared from FY15 to FY18. These Operation and Maintenance costs are inclusive of the Airport Operator Fee paid by the respective airports however excludes the following cost objects:

- Annual Airport Concession Fees paid to AAI
- Finance Costs
- Depreciation and Amortization cost
- Loss on scrapping of assets

Additionally, to the total operation and maintaining costs, the below significant components included in the above operation and maintenance costs were also independently compared for the five Airports.

- Employee costs (Support Staff and Operating staff)
- Rental costs
- Utility costs (Power and fuel)
- Repair and Maintenance costs

iii. The data for the purpose of benchmarking the above costs for the five airports were obtained from the Annual Reports of the respective airports for relevant financial years drawn from their official website.

iv. The benchmarking results are expressed:

- on per Passenger basis; and
- on per ATM basis

Passenger and air traffic movement at the comparable set of airports for the four years are tabulated below:

Table 101: Passenger Traffic at the Comparable Airports in India

(₹ crores)

Airport	**Passenger Traffic**			
Particulars	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	1.54	1.90	2.29	2.69
HIAL	1.05	1.25	1.51	1.82
MIAL	3.66	4.17	4.52	4.85
DIAL	4.10	4.84	5.77	6.57
CIAL	0.64	0.78	0.89	1.01

Table 102: Air Traffic Movement at Comparable Airports

	Air Traffic Movement			
Particulars	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	1,33,500	1,53,100	1,77,300	1,96,600
HIAL	94,100	1,05,800	1,30,700	1,49,600
MIAL	2,69,456	2,96,634	3,05,465	3,20,689
DIAL	3,23,450	3,65,696	4,17,319	4,59,243
CIAL	51,500	56,200	61,700	68,800

a. Operation and maintenance costs comparison

Figure 14: O&M Costs per PAX

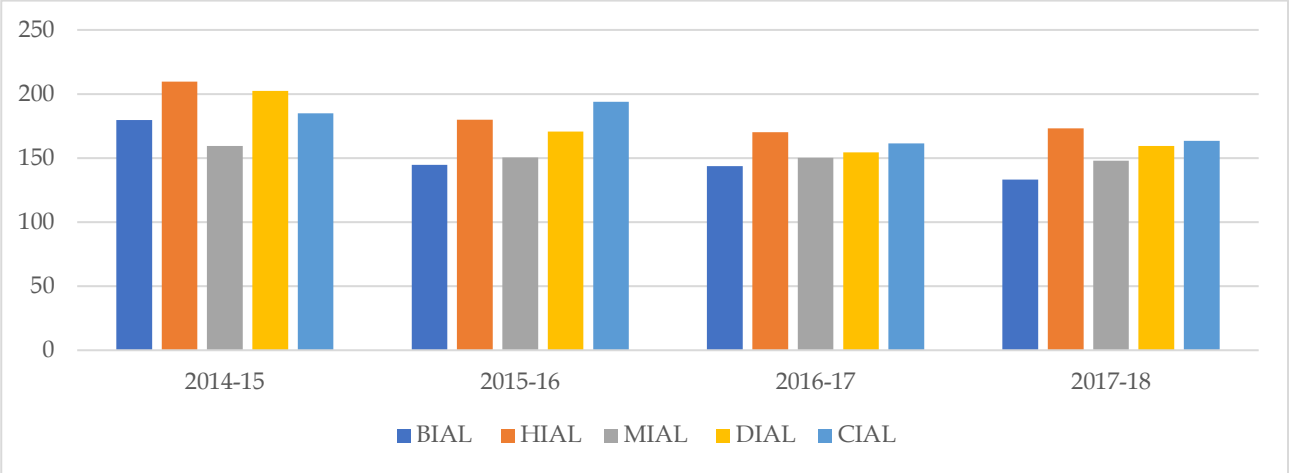
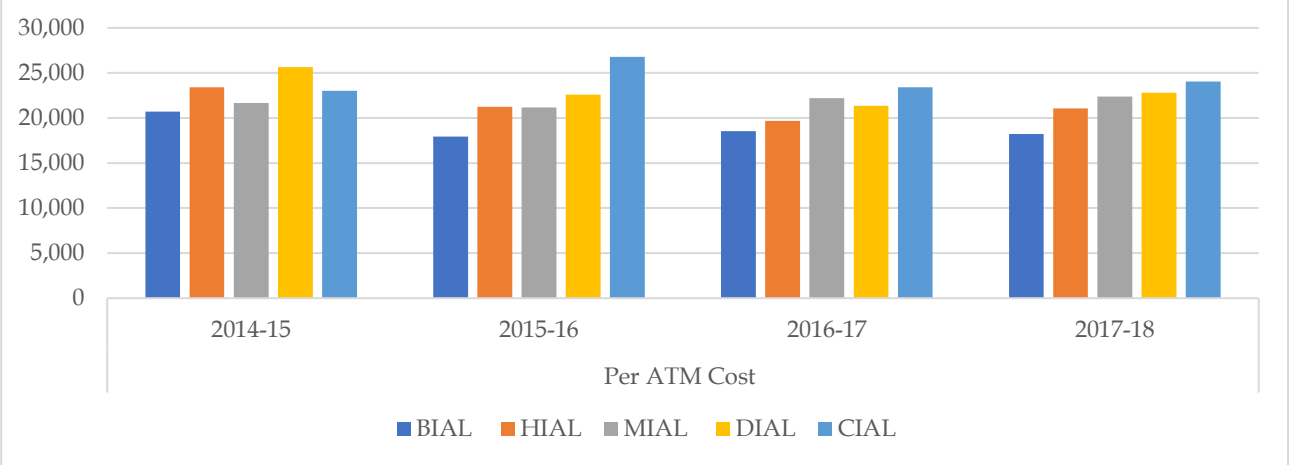


Figure 15: O&M Costs per ATM



Notes:

1. The metric of total cost per PAX and per ATM include both Aeronautical and Non-aeronautical costs. Comparing two airports with different Non-aeronautical activity would not be feasible as the Non-aeronautical costs could be higher due to additional retail activity whilst the Aeronautical costs per PAX/ATM may be same.
2. Since all these costs at the airport are driven by various factors like physical size of the airport, passenger mix, capacity constraints, weather conditions, etc., comparison of operation and maintenance costs between airports may be misleading, considering the complex mix of elements between airports.
   The below table reflects how various costs have different cost drivers and how these cost drivers can vary between airports

Table 103: Cost Objects and Cost Drivers:

Cost	Cost Driver
Employee Costs	• Airside and Terminal Capacity • Air Traffic and Passenger Traffic movement • Local Labour Costs • Local Regulatory Conditions • Degree of Outsourcing
Rental Costs	• Leasehold Property (Including Guest Houses)
Utility Costs (Power, Fuel and Water)	• Physical Size and number of the Runway and Passenger Terminal Buildings • Air Traffic and Passenger traffic movement • Local Regulatory Conditions • Weather Conditions (Temperature and humidity) • Source of Procurement of Power
Repair and Maintenance Costs	• Physical Size and number of the Runway and Passenger Terminal Buildings • Air Traffic and Passenger traffic movement • Range of Services provided by the Airport • Aging of the assets operated at the airport • Degree of Outsourcing of engineering services
Airside Operating and Management Cost	• Physical Size and number of the Runway (Code F Compliant Runway Operations) • Air Traffic Movements • Range of Equipment operated • Degree of Outsourcing of engineering services • Airport Congestion • Local Regulatory Conditions • Technology Absorption
Terminal Management Costs	• Passenger Mix (Domestic and International) • Physical Size and number of the Terminal • Air Traffic and Passenger traffic movement • Range of Services provided by the Airport • Degree of Outsourcing of engineering services • Local Regulatory Conditions (Example: Security) • Airport Congestions • Technology Absorption
Insurance Costs	• Physical Size and number of the Runway and Passenger Terminal Buildings • Premium costs are dependent on number and severity of Incidents Reported • Age of the Assets Operated • Local Regulatory Conditions • Range of the Equipment Operated
Administrative and General Expenses	• Ownership and Governance Structure • Physical Size, number of Runway and Passenger Terminal Buildings • Total Runway and Terminal Capacity • Air Traffic and Passenger traffic movement

To demonstrate the above at the chosen airports, data was collated on few of these cost drivers to understand how each of these airports vary from one to another.

i Number of runways and size of the runways: [11]

Based on available information, it was noted that Mumbai, Delhi and Hyderabad airports out of the five chosen airports operate more than one runway at the airport and are comparatively lengthier and code F compliant (The Width of the Runway can support A380 aircrafts with wingspan more than 80 metres). Since airside management costs like Airside lighting, cleaning and maintenance costs, ground transportation costs, firefighting and safety costs are variable to length and breadth of the runway, costs at Delhi, Mumbai and Hyderabad are expected to be comparatively higher.

Figure 16: Runway Length (In Sqm)

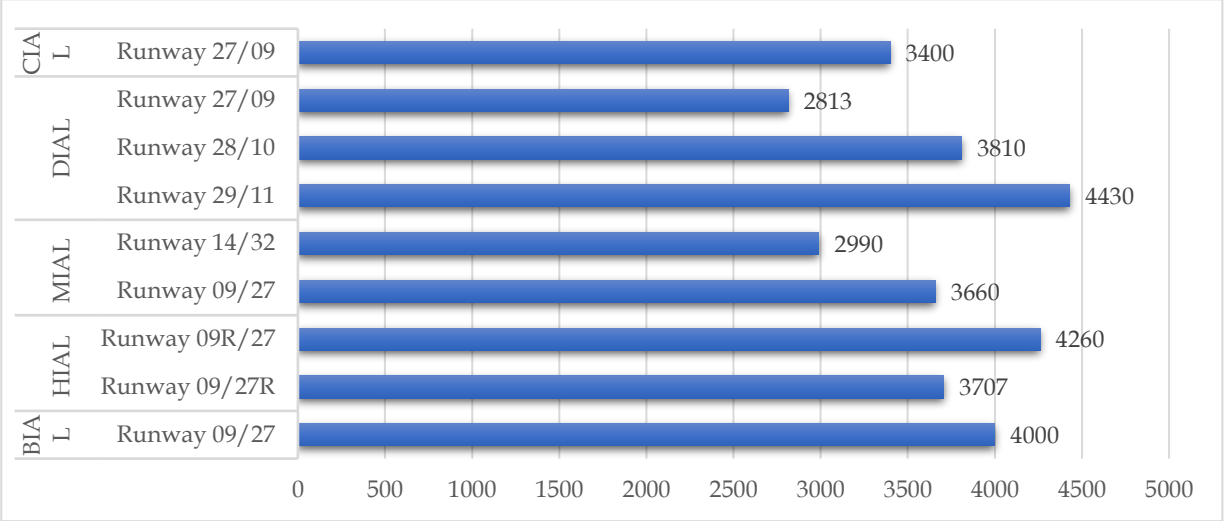
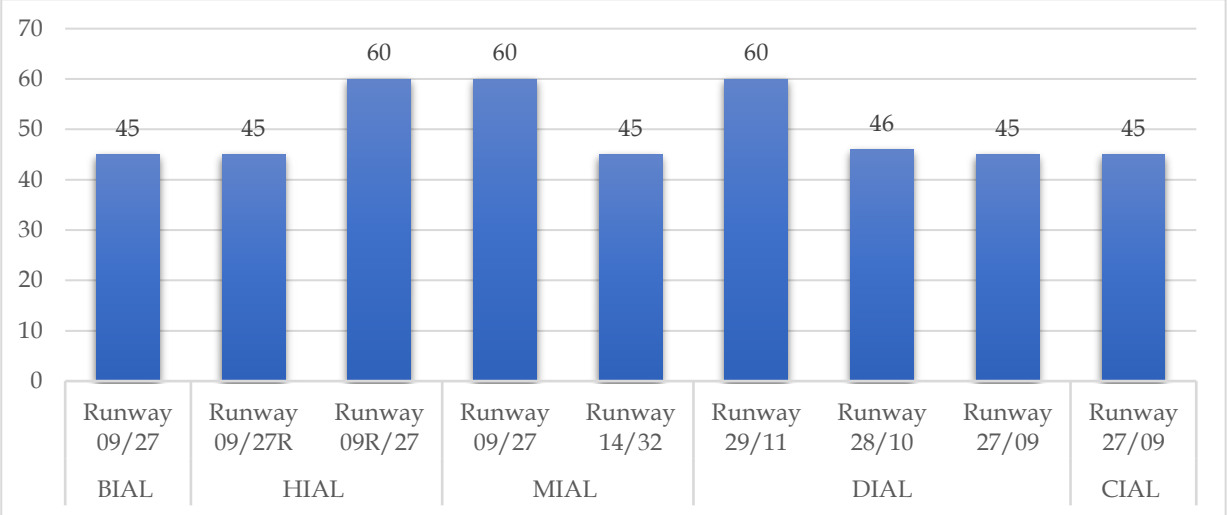


Figure 17: Runway Breadth (In Sqm)



[11] Source: Wikipedia

ii Passenger traffic and air traffic movement[12]

Top 10 busiest airports in India include the chosen airports at the respective ranks and the percentage of growth year on year is as per the below table: [13]:

Table 104: Passenger Traffic Growth % at Comparable Airports

Rank	Airport	City	% Change in FY 18	% Change in FY 17	% Change in FY 16	% Change in FY 15
1	Indira Gandhi International Airport	Delhi	13.8	19.2	18.1	11.1
2	Chhatrapati Shivaji Maharaj International Airport	Mumbai	7.4	8.4	13.7	13.7
3	Kempegowda International Airport	Bengaluru	24.1	20.6	23.2	19.7
4	Rajiv Gandhi International Airport	Hyderabad	20.2	21.9	19.1	20.2
5	Cochin International Airport	Kochi	13.6	16.4	21.0	19.2

The continuous growing trends in air traffic and passenger traffic have significant consequences on passenger satisfaction and airport attractiveness. As passenger convenience factors like comfort, processing time, availability of staff, information visibility, security, etc. affecting the overall airport service quality score is considered as a priority in the agenda of the airport management, increasing traffic have a significant bearing on the costs related to airside and terminal management for maintaining the required passenger satisfaction level.

[12] Source: apaoindia.com

[13] Source: Wikipedia

Figure 18: Air Traffic Movement

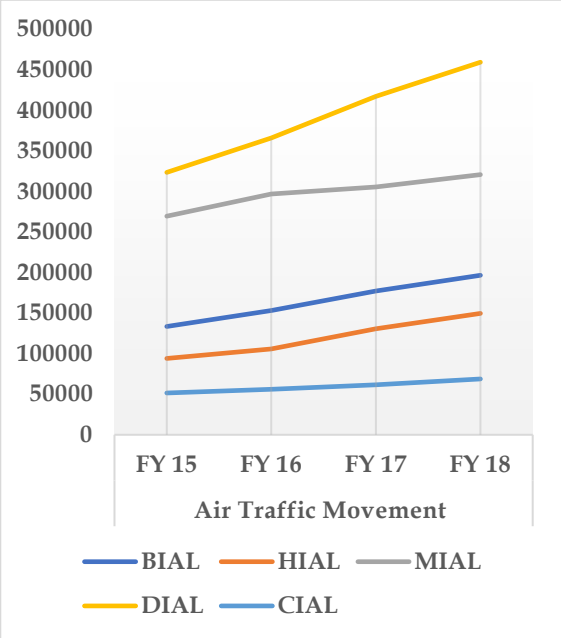
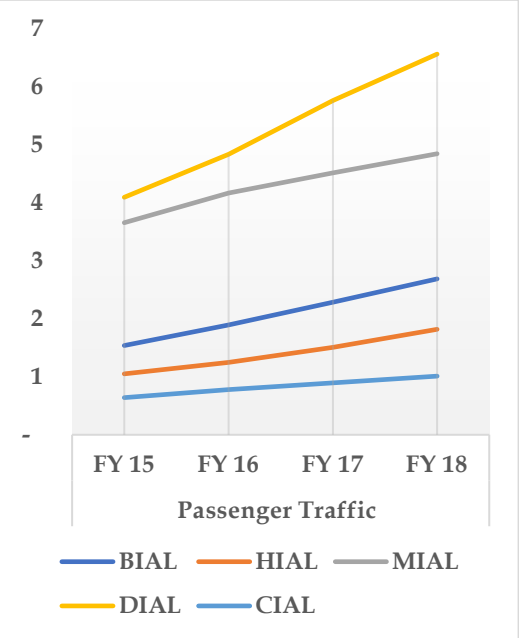


Figure 19: Passenger Traffic Movement



iii Number of terminals and size[14]

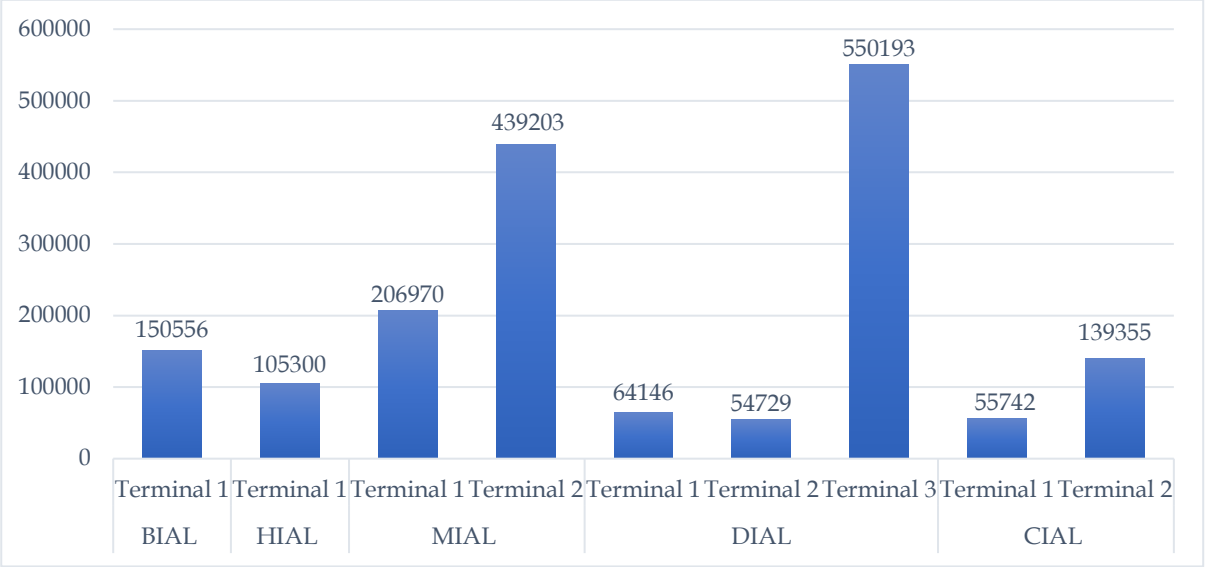
The number and size of the terminal affects various terminal management costs like

- Direct costs of Local Rates and Taxes related the property in use
- Costs to maintain the technical discipline across the terminals for information technology, security systems, people mover systems like the travellators and escalators, the heating ventilation and air conditioning systems
- Maintenance and Cleaning Costs
- Wayfinding and Terminal Signage costs
- Ground Transportation costs
- Airport Security costs, etc.

Consequently, from the information gathered and represented in the below chart, it can be interpreted that these costs would comparatively be higher at the Mumbai and Delhi Airport since they operate more than one and larger terminals.

[14] Source: Wikipedia

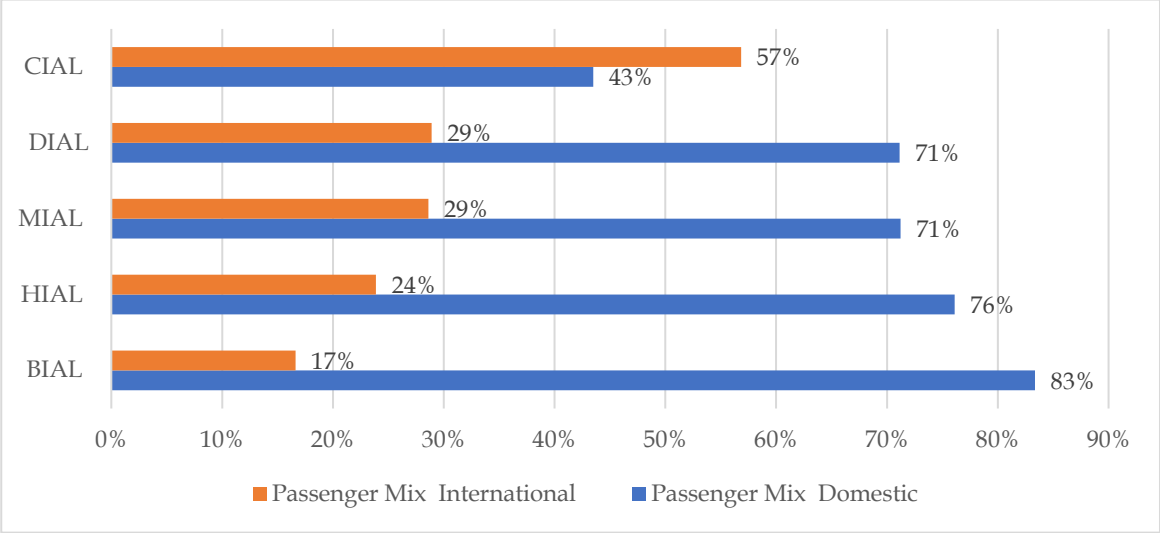
Figure 20: Size of the Terminal (In Sqm)



iv Passenger mix[15]

Since the proportion of International passengers to the Domestic Passengers are higher at the Cochin Airport, higher costs for the additional services like customs, immigration having related costs of security, personnel, health care can be noted.

Figure 21: Average Passenger Mix from FY15 to FY18

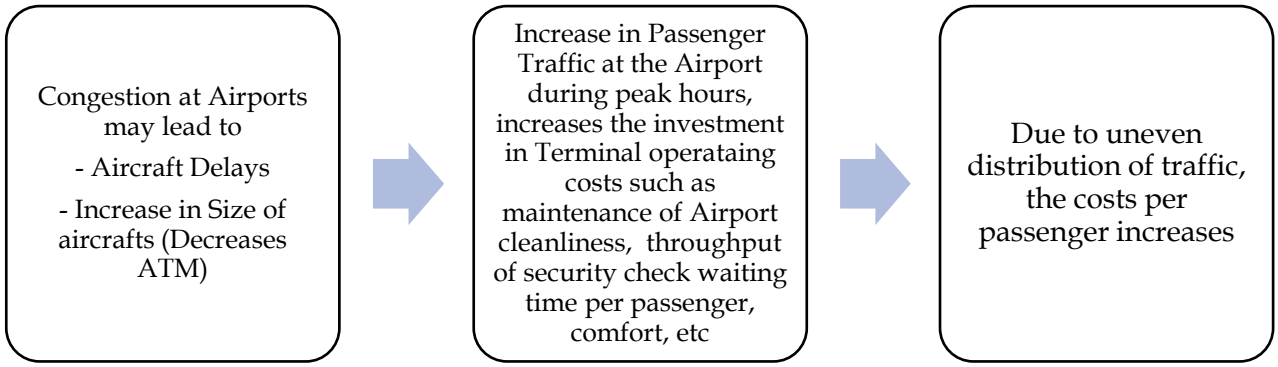


v Terminal capacity utilisation for fy18[16]

Capacity Utilisation have a two-fold effect on the airport operational costs. Increase in utilisation of the available decreases the per PAX and per ATM Costs of the airport but an increase in terminal traffic more than the available capacity may increase the per PAX cost due to the following impact:

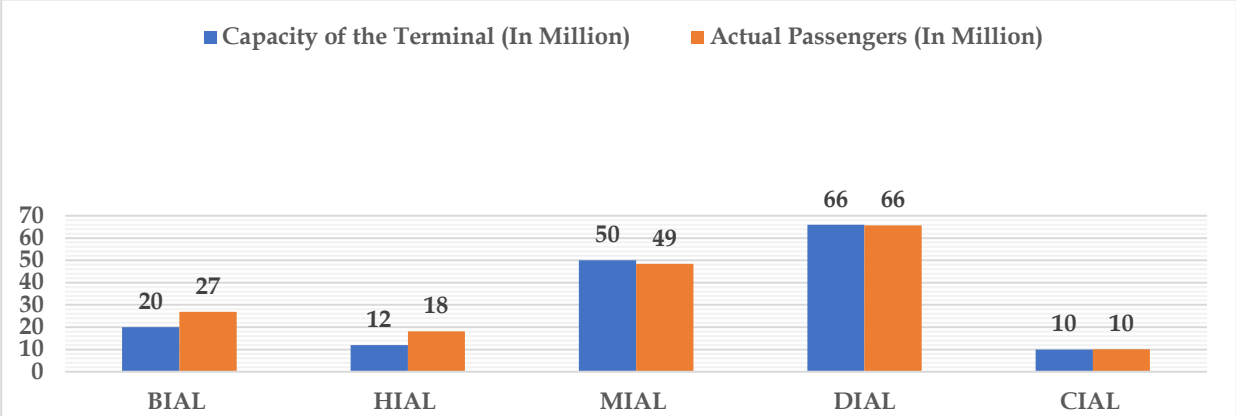
[15] Source capacity: apaoindia.com

[16] Source: apaoindia.com



Thus, could be seen from the below chart, where Cochin, Delhi and Mumbai are currently operating at 100% capacity, airports at Bengaluru and Hyderabad operate at more than capacity which may influence their per PAX costs (Refer Figure Below)

Figure 22: Passenger Terminal Capacity vis-a-vis Actuals (In Million)



vi Weather conditions at the geographic locations of the airports[17]

Weather conditions of the geographic locations of the airport affect primarily the utilities cost such as power, fuel and water.

In locations such as Delhi where the lowest temperature reaches as low as 8 degrees and the highest reach as high as 40 degrees with humidity up to 58% (September 2018), the consumption of power can be comparatively higher to others locations such as Bengaluru where the average temperature remains constant between 20 to 30 degree Celsius

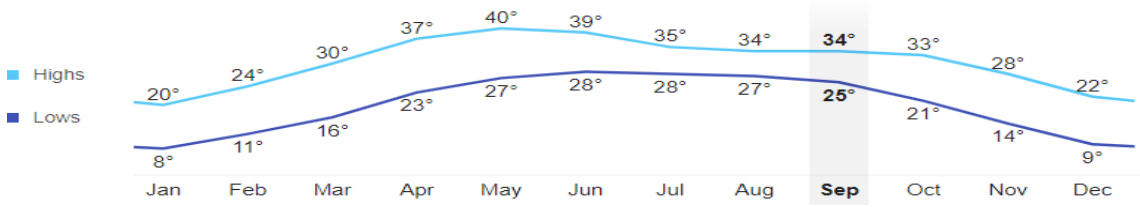
[17] Source: Average temperature for 2018 by NOAA – National Oceanic and Atmospheric Administration

Delhi

Weather averages

Overview Graphs

Temperatures (°C)

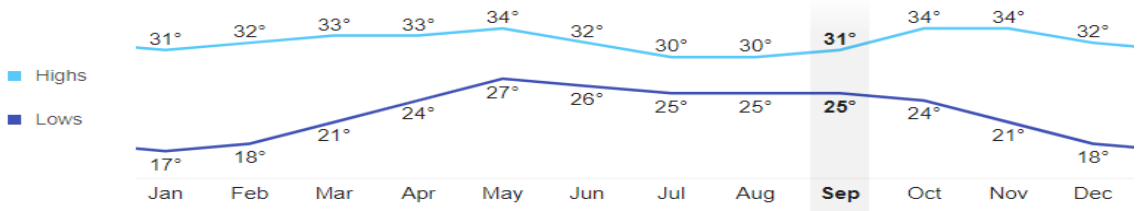


Mumbai, Maharashtra

Weather averages

Overview Graphs

Temperatures (°C)

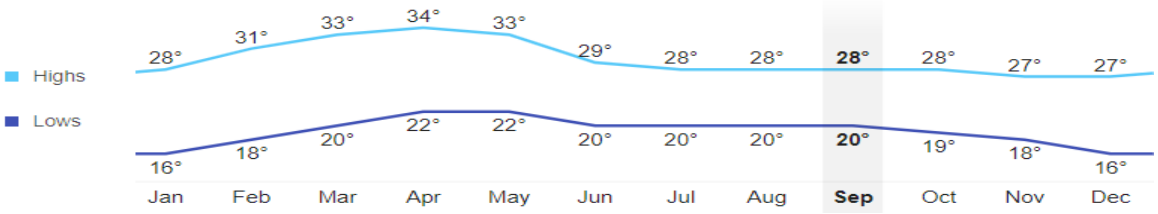


Bengaluru, Karnataka

Weather averages

Overview Graphs

Temperatures (°C)

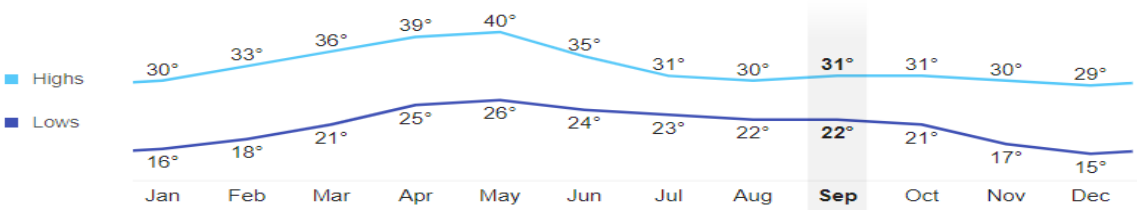


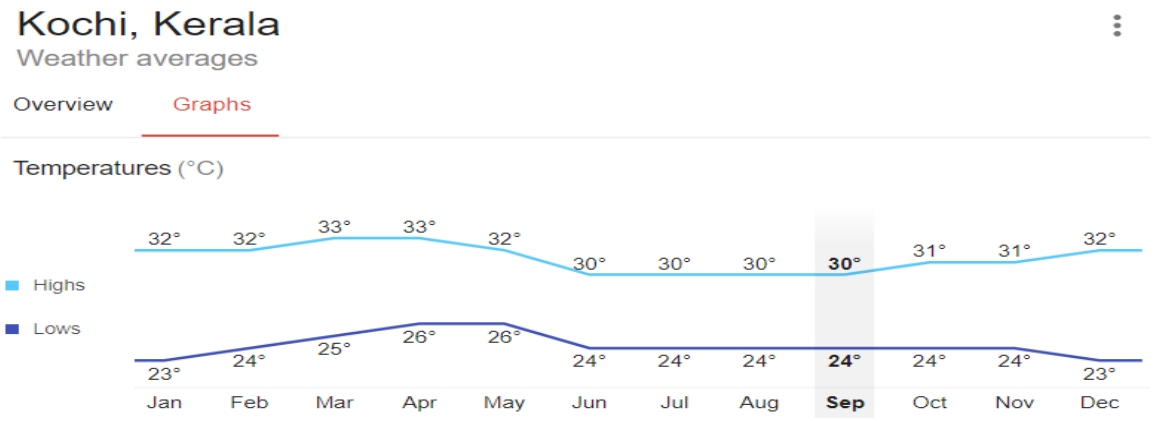
Hyderabad, Telangana

Weather averages

Overview Graphs

Temperatures (°C)





vii Inference from the fluctuating cost drivers

The British Airport Authority (BAA) report on Benchmarking in 2001 emphasizes that several adjustments would be required to produce a notional set of perfectly comparable data across airports. However, such adjusted numbers would not bear any relation to reality. The report illustrates how airports can vary in the degree of services they provide and therefore the costs associated with the same.

Table 105: Variance between comparable airports

Varying Airport Activities include:	Handling activities; International services; Crash and Rescue services; Degree of Security services like cabin Baggage search, Access Control, Other Airfield services
Add on Costs at the Airports	Rates; Airport licences; Corporation tax; Pension/Social security costs
Accounting differences	Asset valuation (replacement methodologies, asset ownership); Intercompany charges
Geographical and Regulatory Differences include	Local utility costs, Local property costs, Local staff costs, Exchange rates
In house/outsourcing	Cleaning; Engineering; Security; Catering; Retail

b. Benchmarking of components of operation and maintenance costs

An effort to analyse the total costs for certain specific cost objects were made to observe the trend movements for the chosen airports and accordingly evaluate the performance of Delhi and Mumbai Airports.

i Employee Cost Benchmarking

Figure 23: Employee Cost Per PAX

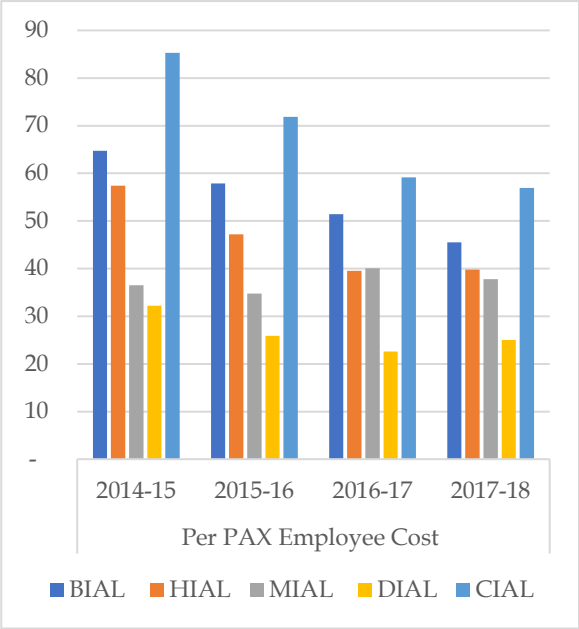
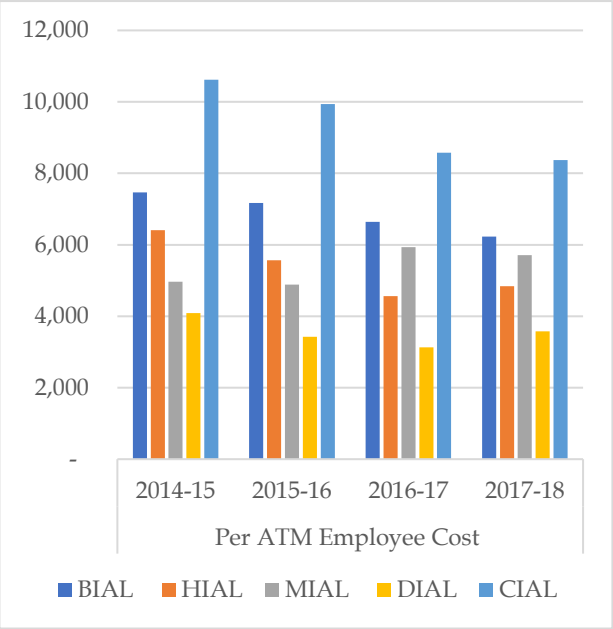


Figure 24: Employee Cost Per ATM



At first, the varying degrees to which airports provide services to its passengers and airlines make this measure of labour productivity particularly difficult to use for external benchmarking.

Further, while certain airports perform all the operations comparing other airports who outsource to other agencies, for example, the Cochin airport performs the operations of Cargo where the other airports have outsourced the same through concessionaires, the manpower costs of the Cochin airport, can be seen to be higher than the others. [18].

[18] Source: Normative Cost Approach by AERA

ii Rental Cost Benchmarking

Figure 25: Rental Cost per PAX

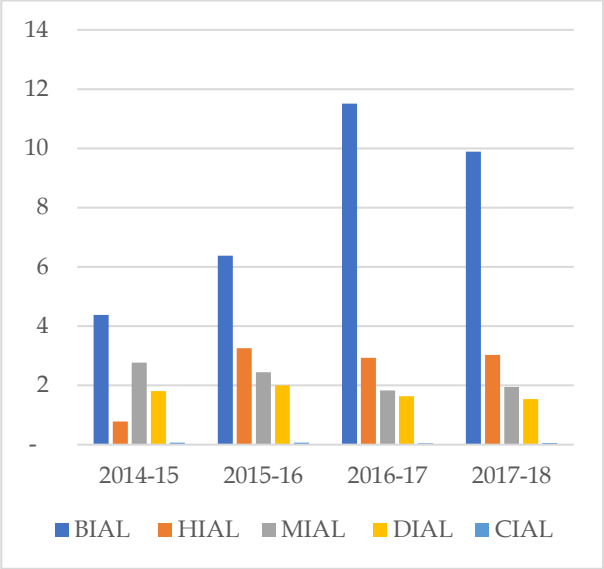
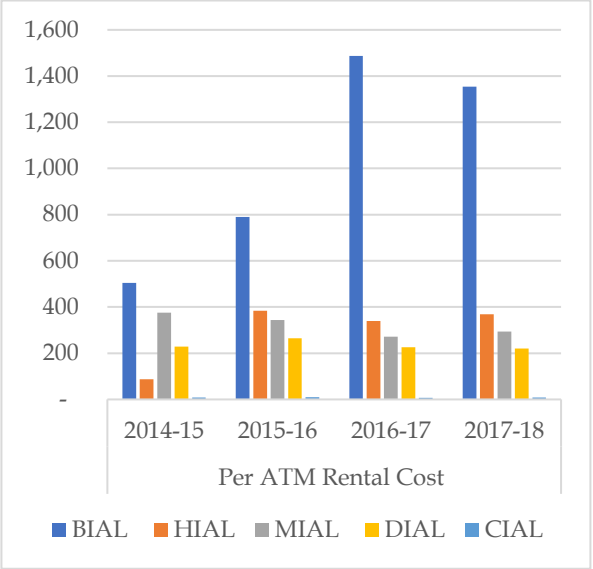


Figure 26: Rental Cost per ATM



Interpreting the above chart, it was noted that BIAL reflects a higher rental cost as compared to the other domestic airports that were benchmarked.

The vital reason for this variation is the fact that Mumbai and Delhi airports are Brown Field projects with minimal rental payable to AAI for leasing of the airports on an "as is where basis". However, BIAL (Green Field Project) entered into a Land Lease Agreement (LLA) with the Karnataka Government (KSIIDC) for approximately 4000 acres of land for which an annual lease rental of 3% of the total site cost of ₹ 211.78 Crores is incurred by BIAL. This lease payment by BIAL justifies the higher costs[19].

[19] Source: Annual Report 17-18 of Kempagowda International Airport Limited

iii Utility Costs (Power, Fuel and Water)

Figure 27: Utility Cost per PAX

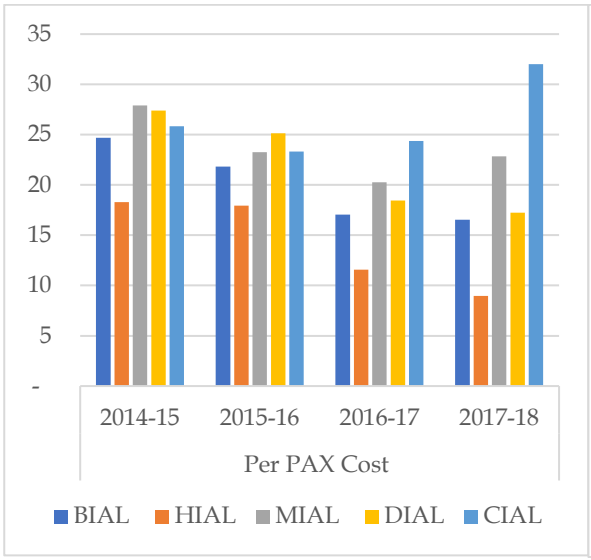
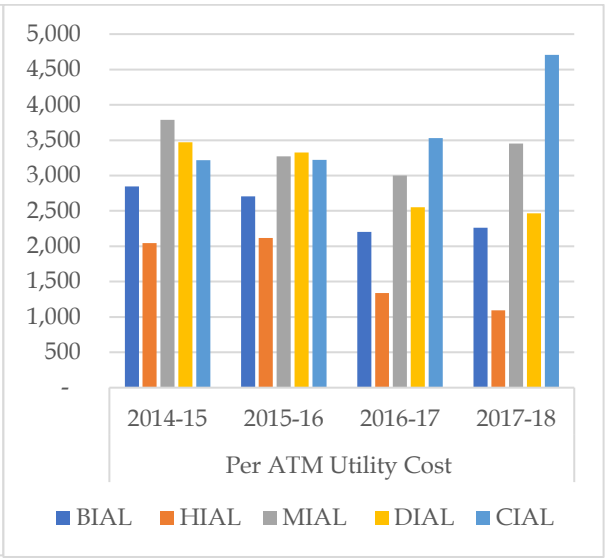


Figure 28: Utility Cost per ATM



Passenger Terminal Building (PTBs) consist of multiple space types in one structure, such as offices, retail, food service (FS), Public Order and Safety (PO&S), Public Assembly (PA), circulation, ticketing/check-in, passenger screening and other support areas. Due to the complexity and variations in the geometry, operations and business model of these terminal buildings for each of the airports, interpreting the energy consumption patterns for the airports becomes complicated.

iv Repairs and Maintenance

Figure 29: R&M Building per ATM

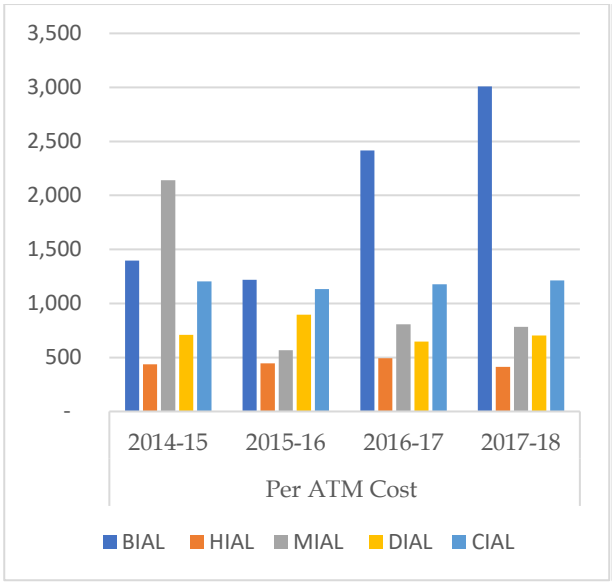


Figure 30: R&M Others per ATM

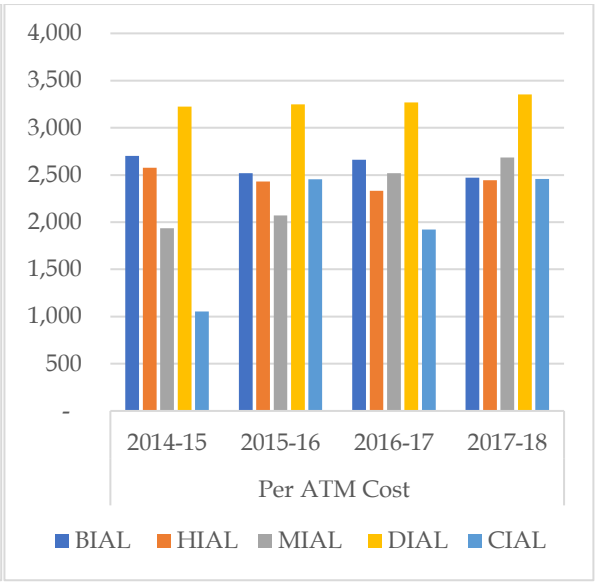


Figure 31: R&M Building per PAX

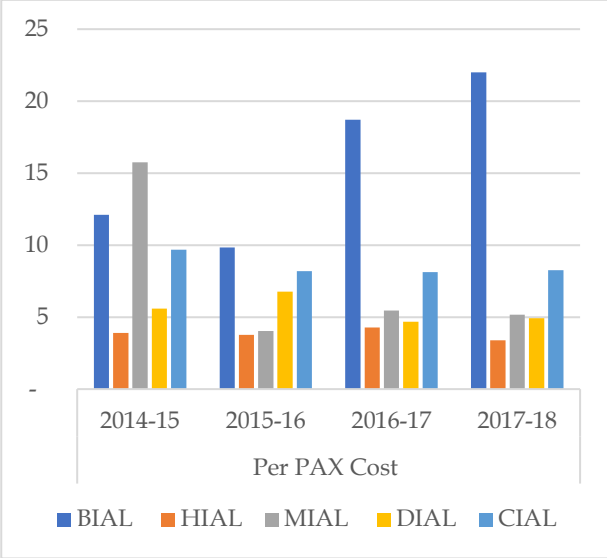
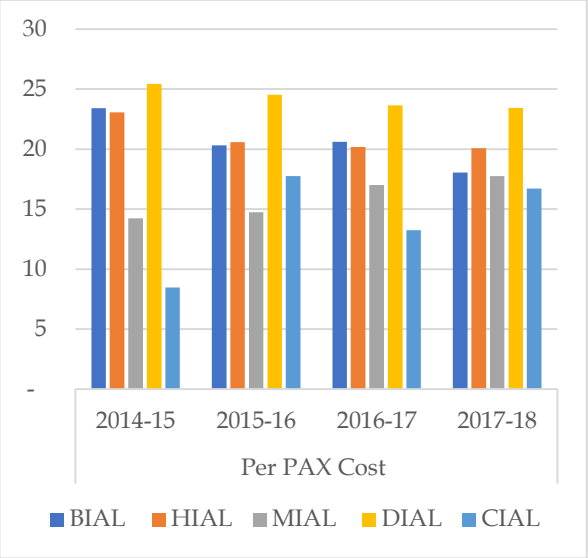


Figure 32: R&M Others per PAX



Maintenance ensures that airport buildings and installations are kept fully operational; it includes the internal equipment of the terminal (e.g. baggage conveyor belts, moving stairways, passageways, heating and air conditioning systems, power supply) and the external equipment (e.g. runway lighting, instrument landing system, telecommunication and meteorological equipment), as well as airport vehicles (e.g. buses, firefighting and apron vehicles).

Disparity between the airports in the number of terminals, runways and equipment operated makes these numbers incomparable. Further the extent to which these engineering services may be performed by outside consultants or contractors at airports to enable them to efficiently use such services on a permanent and continuous basis may also add to the reason why these numbers may not be accurately comparable.

c. Benchmarking – DIAL and MIAL

Due to the unavailability of specific information related the proportion of direct operating and administrative expenses to the total operation and maintenance costs of an airport and the proportion of the Operating staff and support staff to the total manpower strength at the airport to benchmark the cost levels involved in the backend functioning of airports, the exercise of benchmarking for these two parameters were restricted only to Delhi and Mumbai Airports.

i Proportion of Operation and Maintenance Cost (excluding A&G expenses) to the Administrative and General (A&G) expenses at MIAL and DIAL

The below table shows the total cost per PAX at the Mumbai and Delhi Airport split into proportion of costs related to operation of the Terminal like

- Costs of Power, fuel and Water
- Costs of Consumables
- Repair and Maintenance Expenses
- Insurance
- Housekeeping and Security Expenses

and other indirect costs (A&G) required for supporting the functions of the airports like:

- Rent, Rates and Taxes
- Costs related the Corporate Social Responsibilities

- Advertisement
- Traveling and Conveyance
- Professional Consultancy Charges, etc.

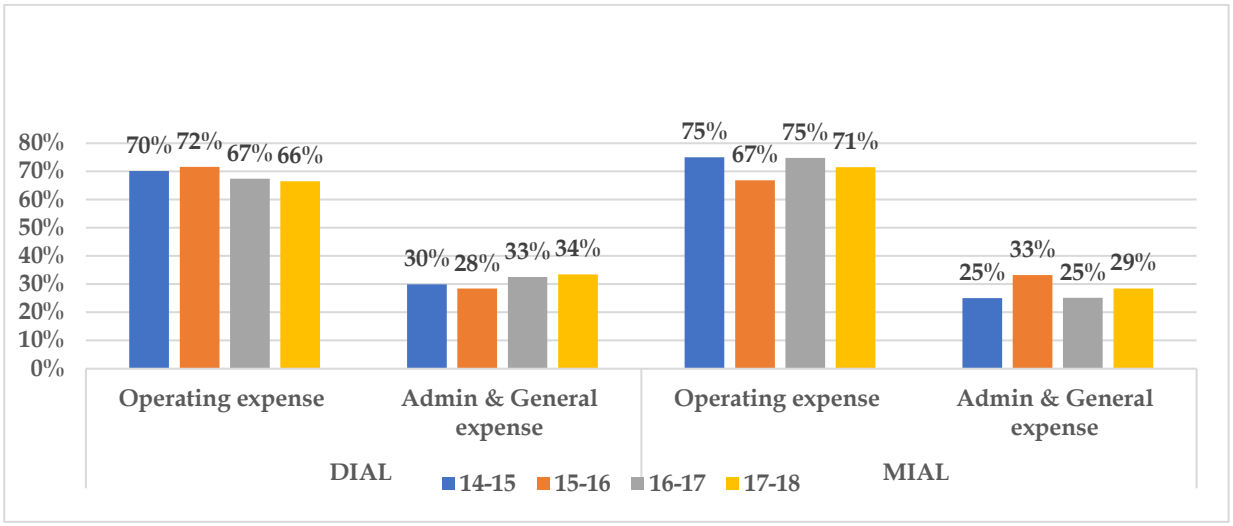
Table 106: Proportion of Terminal Operating Cost and A&G Expenses at MIAL and DIAL

(₹ crores)

	Cost per PAX				Proportion of Costs			
Particulars	**FY15**	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
DIAL Terminal Operating Cost (excluding A&G)	97.25	83.64	69.42	71.23	70%	72%	67%	66%
DIAL Admin & General expense	41.47	33.22	33.50	35.89	30%	28%	33%	34%
Total Cost per PAX - DIAL	**138.72**	**116.86**	**102.92**	**107.12**				
MIAL Terminal Operating (excluding A&G)	88.01	73.25	78.28	76.86	75%	67%	75%	71%
MIAL Admin & General expense*	29.26	36.38	26.36	30.65	25%	33%	25%	29%
Total Cost per PAX - MIAL	**117.27**	**109.63**	**104.65**	**107.51**				

*The Expenses of MIAL excludes the Collection Charges on Development Fund until FY17 as the same is adjusted against the revenue in the books of DIAL.

Figure 33: Terminal Maintenance Cost versus A&G Expense



The above table when represented in graphs comparing the proportions maintained at both the airports, it was noted on an average both the airports operate at the same levels of operating and non-operating costs.

ii Proportion of support staff (non-operating) to operating staff at MIAL and DIAL

The below table shows the total employee count at the Mumbai and Delhi Airport split into manpower directly engaged with the operation of the airport working in departments like

- Airside Management
- Terminal Management
- Project and Engineering
- Baggage Operations
- Security
- Slot and Data Management

and manpower not directly related to the functional departments of the airport but required for supporting the functions of the airports like

- Senior Management Office
- Support Business functions like Legal, audit and assurance, Information Technology, etc.
- Human Resource Management
- Aeronautical Marketing Team, etc.

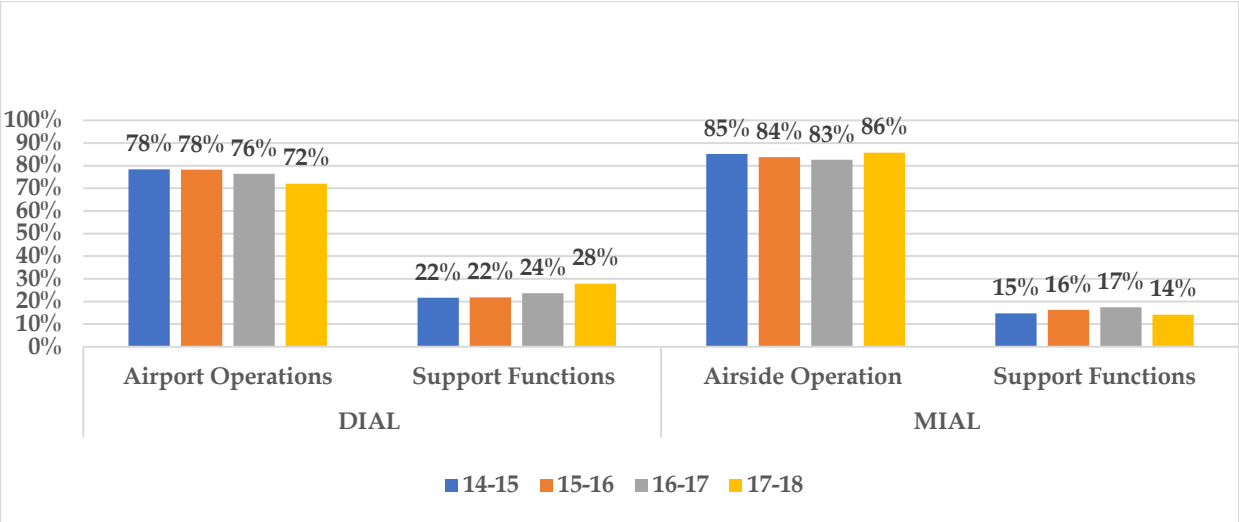
Table 107: Proportion of Operating and Support Staff at DIAL and MIAL

(₹ crores)

		Manpower Count				Proportion of Support Functions			
Particulars		**FY15**	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
MIAL	Airside Operation	1152	1065	1022	988	85%	84%	83%	86%
	Support Functions	200	207	216	164	15%	16%	17%	14%
	Total	**1352**	**1272**	**1238**	**1152**	-	-	-	-
DIAL	Airport Operations	1245	1187	1130	1252	78%	78%	76%	72%
	Support Functions	343	331	350	485	22%	22%	24%	28%
	Total	**1588**	**1518**	**1480**	**1737**	-	-	-	-

-

- *Figure 34: Operational Staff versus Support Staff*



The above table when represented in graphs comparing the proportions maintained at both the airports, it was noted that on an average MIAL maintains a slightly lower proportion of non-support staff when compared to DIAL.

d. Summary

In setting up of the efficiency target for the operations of Airports in India, we must be mindful of the numerous uncontrollable factors that vary between the airports since these variable factors are generally consistent with costs. The above charts only give a general impression of how airport performance compares with other airports but aren't suitable to set regulatory price caps.

4.2.2 International benchmarking[20]

i Broadly meeting the criterion of comparable airport size to MIAL in terms of its passenger capacity of around 66 MAP, Leigh- Fisher has selected fifteen airports for which data are available for the purpose of International Benchmarking. The List of fifteen airport along with the passenger throughout for calendar year 2017 are as per the table below

Table 108: List of Comparable International Airports

(₹ crores)

Airport	Domestic	International	Total
Delhi	4.84	1.73	6.57
Amsterdam	0.00	7.58	7.58
Beijing	7.01	2.56	9.58
Hong Kong	-	7.36	7.36
London Gatwick	0.40	4.17	4.57
London Heathrow	0.48	7.32	7.80
Los Angeles	6.09	2.57	8.66
Melbourne	2.59	1.09	3.68
Miami	2.23	2.14	4.38
Mumbai	**3.48**	**1.36**	**4.85**
Munich	0.98	3.47	4.45
Rome Airports	1.17	3.50	4.69
San Francisco	4.39	1.38	5.77
Singapore Changi	-	6.30	6.30
Sydney	2.74	1.60	4.33
Tokyo Narita	0.75	3.34	4.09

ii. For the above airports, benchmarks were produced for the following cost Objects

- Total operating costs
- Staff costs

[20] Leigh Fisher

- Total non-staff operating costs
- Maintenance Cost

In addition, data are available to produce benchmarks of maintenance costs for the following nine airports (in addition to MIAL):

- ✓ Amsterdam
- ✓ Beijing
- ✓ Hong kong
- ✓ London Gatwick
- ✓ London Heathrow
- ✓ Melbourne
- ✓ San Francisco
- ✓ Singapore Changi
- ✓ Sydney

iii. The results are expressed in three ways

- on a per passenger basis;
- on a per ATM basis;
- in relation to airport capacity;

and in the following currencies for each of the three options above:

- Indian Rupees;
- US Dollars;
- SDRs (see below).

The SDR is an international reserve asset, created by the International Monetary Fund (IMF), to supplement its member countries' official assets. The value of the SDR is based on a basket of five currencies – the US Dollar, the Euro, the Chinese Ren, the Japanese Yen and the British Pound.

iv. The Benchmarking exercise was carried out with the data for calendar year 2017

v. Results of the International Benchmarking

A. Per Passenger Basis

- Mumbai ranks in 16th position (*in order of highest to lowest cost*) out of 16 airports in terms of total costs per passenger.
- Mumbai ranks in 15th and 16th positions (*in order of highest to lowest cost*) in terms of staff costs and non-staff costs per passenger respectively.

B. Per ATM Basis

- Mumbai ranks in 16th position (*in order of highest to lowest cost*) out of 16 airports in terms of total costs per passenger.
- Mumbai ranks in 15th and 16th positions (*in order of highest to lowest cost*) in terms of staff costs and non-staff costs per passenger respectively.

C. Per Terminal Capacity

- Mumbai ranks in 15th position (*in order of highest to lowest cost*) out of 16 airports in terms of total costs per passenger.

Mumbai ranks in 15th position (*in order of highest to lowest cost*) and 16th Position in terms of staff costs and non-staff costs per passenger respectively.

Summary

Review of 15 airports with reference to the following, showed that

- the total cost per passenger,

- staff costs per passenger and

- non-staff cost per passenger

CSMI Airport was the lowest amongst its peers (15 international airports as mentioned above). Further it is to be noted that the chosen comparable airports only broadly meet the criterion of 'comparable airport size', it is interpreted that the Operation and maintenance cost levels at the CSMI Airport are comparatively lower than its peer airports.

4.3 Chapter summary

- **Internal benchmarking** was performed by analysing following components of costs of MIAL over a period:
  - Total Terminal Maintenance/Operating Cost (Refer Table 96)
  - Total Administrative and General Expense (Refer Table 96)
  - Total Manpower Cost (Refer Table 96)

  The percentage change in costs over First & Second Control Periods were analyzed and the probable factors affecting the above change were noted.

  The internal benchmarking analysis (Refer Table 96 along with Table 98) showed that the increase in operational expenses of MIAL vis-à-vis passenger traffic and air traffic movement growth, has been modest over the last 10 years (excluding FY 14, where there is spike in expenses due to inauguration of Terminal 2).

- **External Benchmarking** was performed comparing MIAL with the following 4 domestic airports and 15 international airports:
  - Bengaluru Airport
  - Hyderabad Airport
  - Delhi Airport
  - Cochin Airport

  Overall, MIAL's Operation and Maintenance costs (per passenger and ATM) were reasonable in comparison with other airports (as shown in Figure 27 to Figure 32). A comparison of Operation and Maintenance and Administration costs of DIAL and MIAL showed that on an average both the airports operate at the same levels of operating and non-operating costs (as shown in Table 106 and figure 33).

- On benchmarking MIAL with 15 comparable international airports, it was noted that MIAL's costs (total cost, staff cost and non-staff costs per passenger) was lowest as compared to its peers (as shown in Table 108).

5 OTHERS

5.1 Limitations

- We have relied on the reports of internal auditors, statutory auditors, cost auditors and the verification reports with respect to physical verification of fixed assets. As part of our study, we have performed a sample verification of internal documents for assessment of baseline costs and for its appropriate segregation in to 'Aeronautical' and Non-aeronautical'.

- Our work procedures do not constitute an audit, examination or a review in accordance with generally accepted auditing standards or attestation standard as is expected under section 143 of the Company's Act, 2013. Consequently, we do not intend to express any opinion on the accuracy or appropriateness of such expenditures or its underlying assumptions.

- The study on the segregation of Assets and Operation and Maintenance Expenses and testing of the baseline costs for the Second Control Period were limited to data up to FY 18 only. However, any impact arising due to differences in opinion with the segregation logics adopted by MIAL were worked out also for FY 19.

- Our review of classification of expenses were based on the description of the expense as provided by MIAL. We did not audit the veracity of these descriptions for the purpose of our engagement

5.2 Annexure to domestic benchmarking

5.2.1 Total cost for the airports

Table 109: Total Cost at the Comparable Domestic Airports[21]

(₹ crores)

Total Cost				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL (Excluding Concession fee)	277	275	329	358
HIAL	220	225	257	315
MIAL	583	627	679	718
DIAL	830	825	891	1,047
CIAL	119	151	144	165
Employee Cost				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL	100	110	118	123
HIAL	60	59	60	72
MIAL	134	145	181	183
DIAL	132	125	131	164
CIAL	55	56	53	58
Rental Cost				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL	7	12	26	27
HIAL	1	4	4	6
MIAL	10	10	8	9
DIAL	7	10	9	10
CIAL	0	0	0	0
Power and Water				

[21] Audited Financial statements of respective Airport

Total Cost				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL	38	41	39	44
HIAL	19	22	17	16
MIAL	102	97	92	111
DIAL	112	122	107	113
CIAL	17	18	22	32
R&M - Building				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL	19	19	43	59
HIAL	4	5	6	6
MIAL	58	17	25	25
DIAL	23	33	27	32
CIAL	6	6	7	8
R&M - Machinery and Others				
	FY 15	**FY 16**	**FY 17**	**FY 18**
BIAL	36	39	47	49
HIAL	24	26	30	37
MIAL	52	61	77	86
DIAL	104	119	136	154
CIAL	5	14	12	17

5.2.2 Cost per pax and cost per ATM

Table 110: Costs per PAX and ATM at the comparable domestic airports[22]

(₹)

	Per PAX Total Cost				**Per ATM Cost**			
	FY15	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**

[22] Audited Financial statements of respective Airport

	Per PAX Total Cost				**Per ATM Cost**			
BIAL (Excluding Concession fee)	180	145	144	133	20,719	17,934	18,553	18,227
HIAL	210	180	170	173	23,409	21,237	19,666	21,071
MIAL	159	150	150	148	21,651	21,151	22,214	22,380
DIAL	202	171	154	159	25,648	22,573	21,346	22,806
CIAL	185	194	162	164	23,027	26,797	23,406	24,053
	Per PAX Employee Cost				**Per ATM Employee Cost**			
	FY15	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	65	58	51	46	7,466	7,174	6,644	6,231
HIAL	57	47	40	40	6,412	5,569	4,564	4,840
MIAL	37	35	40	38	4,963	4,890	5,932	5,714
DIAL	32	26	23	25	4,085	3,427	3,129	3,582
CIAL	85	72	59	57	10,621	9,937	8,576	8,369
	Per PAX Rental Cost				**Per ATM Rental Cost**			
	FY15	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	4	6	12	10	505	790	1,487	1,354
HIAL	1	3	3	3	87	384	339	368
MIAL	3	2	2	2	376	344	271	294
DIAL	2	2	2	2	229	265	226	220
CIAL	0	0	0	0	9	9	7	8
	Per PAX Utility Cost				**Per ATM Utility Cost**			
	FY 15	**FY 16**	**FY 17**	**FY 18**	**FY 15**	**FY 16**	**FY 17**	**FY 18**
BIAL	25	22	17	17	2,846	2,704	2,202	2,261
HIAL	18	18	12	9	2,043	2,119	1,338	1,092
MIAL	28	23	20	23	3,788	3,271	3,001	3,453
DIAL	27	25	18	17	3,473	3,327	2,553	2,465
CIAL	26	23	24	32	3,216	3,224	3,531	4,708

	Per PAX Total Cost				**Per ATM Cost**			
	Per PAX R&M- Building Cost				**Per ATM R&M- Building Cost**			
	FY15	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	12	10	19	22	1,396	1,220	2,417	3,010
HIAL	4	4	4	3	435	445	493	414
MIAL	16	4	5	5	2,140	566	807	782
DIAL	6	7	5	5	709	896	647	704
CIAL	10	8	8	8	1,205	1,134	1,179	1,214
	Per PAX R&M- Machinery and Others Cost				**Per ATM R&M- Machinery and Others Cost**			
	FY15	**FY16**	**FY17**	**FY18**	**FY15**	**FY16**	**FY17**	**FY18**
BIAL	23	20	21	18	2,700	2,517	2,660	2,470
HIAL	23	21	20	20	2,576	2,429	2,332	2,443
MIAL	14	15	17	18	1,934	2,071	2,518	2,686
DIAL	25	25	24	23	3,224	3,248	3,269	3,354
CIAL	8	18	13	17	1,055	2,453	1,920	2,457

5.3 Airport service quality information

Table 111 ASQ Rating Parameters and Scores for Quarter 2 2018, Quarter 3 2018 and Quarter 4 2019[23]

ASQ PARAMETERS	DOMESTIC			INTERNATIONAL		
	Q2'18	Q3'18	Q4'19	Q2'18	Q3'18	Q4'19
OVERALL SATISFACTION	**SCORE**					
Overall satisfaction with the airport	4.99	5.00	4.99	4.98	5.00	5.00
Overall satisfaction with the airport; business PAX	4.99	5.00	4.99	5.00	5.00	5.00
Overall satisfaction with the airport; leisure PAX	4.99	5.00	4.98	4.99	5.00	5.00
Overall satisfaction other+ Leisure	4.99	5.00	4.99	4.98	5.00	5.00
ACCESS						
Ground transportation to/ from the airport	4.73	4.83	4.90	4.66	4.83	4.93
Availability of parking facilities	4.87	4.82	4.92	4.84	4.90	4.87
Parking facilities value for money	4.72	4.73	4.66	4.50	4.77	4.74
Availability of baggage carts/ trolleys	4.82	4.81	4.84	4.84	4.77	4.82
CHECK-IN (AT THIS AIRPORT)						
Waiting time in check-in-queue/ line	4.66	4.77	4.71	4.64	4.79	4.76
Efficiency of check-in staff	4.61	4.75	4.93	4.63	4.72	4.94
Courtesy and helpfulness of inspection staff	4.84	4.83	4.96	4.82	4.81	4.96
PASSPORT/ PERSONAL ID CONTROL						
Waiting time at passport/ personal ID inspection	NA	NA	NA	4.75	4.80	4.87
Courtesy and helpfulness of inspection staff	NA	NA	NA	4.66	4.65	4.95

[23] Source: Management information

ASQ PARAMETERS	DOMESTIC			INTERNATIONAL		
	Q2'18	Q3'18	Q4'19	Q2'18	Q3'18	Q4'19
SECURITY						
Courtesy and helpfulness of security staff	4.79	4.85	4.94	4.71	4.78	4.95
Thoroughness of Security inspection	4.59	4.72	4.81	4.65	4.71	4.82
Waiting time at security inspection	4.80	4.79	4.73	4.75	4.78	4.71
Feeling of being safe and secure	4.87	4.87	4.95	4.84	4.84	4.93
FINDING YOUR WAY						
Ease of finding your way through airport	4.70	4.83	4.87	4.66	4.75	4.83
Flight information screens	4.59	4.71	4.88	4.64	4.69	4.83
Walking distance inside the terminal	4.84	4.80	4.77	4.82	4.76	4.71
Ease of making connections with other flights	4.90	4.85	4.97	4.85	4.87	4.96
AIRPORT FACILITIES						
Courtesy, helpfulness of airport staff	4.80	4.89	4.94	4.78	4.78	4.92
Restaurant/ eating facilities	4.58	4.76	4.89	4.49	4.73	4.84
Restaurant facilities value for money	4.66	4.72	4.81	4.53	4.67	4.78
Availability of bank/ ATM facilities/ money changers	4.66	4.85	4.83	4.74	4.79	4.82
Shopping facilities	4.80	4.87	4.91	4.71	4.85	4.91
Shopping facilities value for money	4.34	4.54	4.75	4.42	4.49	4.71
Internet access/ Wi-Fi	4.84	4.82	4.77	4.77	4.77	4.71
Business/ Executive lounges	4.76	4.76	4.90	4.84	4.77	4.85
Availability of washrooms/ toilets	4.86	4.89	4.93	4.89	4.88	4.90
Cleanliness of washrooms/ toilets	4.75	4.81	4.92	4.75	4.82	4.97
Comfort of waiting/ gate areas	4.88	4.85	4.95	4.84	4.86	4.97

ASQ PARAMETERS	DOMESTIC			INTERNATIONAL		
	Q2'18	Q3'18	Q4'19	Q2'18	Q3'18	Q4'19
Cleanliness of airport terminal	4.90	4.95	4.92	4.92	4.95	4.97
Ambience of the airport	4.96	4.93	4.95	4.97	4.97	4.97
ARRIVAL SERVICES						
Arrivals passport and visa inspection	4.76	4.86	4.91	4.61	4.83	4.87
Speed of baggage delivery service	4.78	4.88	4.95	4.81	4.85	4.94
Customs inspection	4.75	4.85	4.89	4.76	4.88	4.85

OVERALL SATSFACTION							
ASQ PARAMETERS		DOMESTIC			INTERNATIONAL		
		Q2'18	Q3'18	Q4'19	Q2'18	Q3'18	Q4'19
	Overall satisfaction with the airport	4.99	5.00	4.99	4.98	5.00	5.00
Navigational Items	Ease of finding your way through airport/ Sign posting	4.70	4.83	4.87	4.66	4.75	4.83
	Flight information screens	4.59	4.71	4.88	4.64	4.69	4.83
	Walking distance	4.84	4.80	4.77	4.82	4.76	4.71
Connectivity items	Ease of making connections with other flights	4.90	4.85	4.97	4.85	4.87	4.96
	Ground transportation to/ from the airport	4.73	4.83	4.90	4.66	4.83	4.93
Service Facilities	Availability of Baggage carts	4.82	4.81	4.84	4.84	4.77	4.82
	Restaurant/ Eating facilities	4.58	4.76	4.89	4.49	4.73	4.84
	Shopping Facilities	4.80	4.87	4.91	4.71	4.85	4.91
	Business Facilities (ATM/ Money Exchange)	4.76	4.76	4.83	4.84	4.77	4.82
	Washrooms (Cleanliness)	4.75	4.81	4.92	4.75	4.82	4.97

OVERALL SATSFACTION							
ASQ PARAMETERS		**DOMESTIC**			**INTERNATIONAL**		
		Q2'18	**Q3'18**	**Q4'19**	**Q2'18**	**Q3'18**	**Q4'19**
	Parking Facilities	4.87	4.82	4.92	4.84	4.90	4.87
Value for Money	Restaurant/ Eating facilities	4.66	4.72	4.81	4.53	4.67	4.78
	Shopping Facilities	4.34	4.54	4.75	4.42	4.49	4.71
	Parking Facilities	4.72	4.73	4.66	4.50	4.77	4.74
Service Delivery	Courtesy, helpfulness of airport staff	4.80	4.89	4.71	4.78	4.78	4.76
	Comfort of waiting/ gate areas	4.88	4.85	4.95	4.84	4.86	4.97
	Speed of baggage delivery services	4.78	4.88	4.95	4.81	4.85	4.94
Environmental Factors	Cleanliness of airport terminal	4.90	4.95	4.98	4.92	4.95	4.99
	Ambience of the airport	4.96	4.93	4.98	4.97	4.97	4.99
Airline Factors	Waiting time in Check-in	4.66	4.77	4.71	4.64	4.79	4.76
	Efficiency of Check-in	4.61	4.75	4.93	4.63	4.72	4.94
	Courtesy, helpfulness of check-in staff	4.84	4.83	4.96	4.82	4.81	4.96
	Business/ executive lounges	4.76	4.76	4.90	4.84	4.77	4.85

Average ASQ rating (overall satisfaction) for domestic is 4.81 and international is 4.80.

Conclusion: The above conclusions are consistent with the inference drawn from the internal and external benchmarking exercise that demonstrate that MIAL has maintained efficient O&M costs vis-à-vis the ramp up in operations driven by passenger and ATM growth over the duration of the Second Control Period.

6 REPORT SUMMARY

- During the calendar year 2017, which is the latest available data, Chhatrapati Shivaji Maharaj International Airport (CSMIA) ranked as the second busiest airport in India in terms of total (domestic + international) passenger traffic as well as international passenger traffic after Delhi. On the total passenger traffic parameter, it was ranked the 14th busiest airport in Asia and 28th busiest airport in the world .
- CSMIA has seen a passenger traffic growth at 7.26% CAGR between FY 15 & FY 18, ATM growth at 4.52% CAGR between FY 15 & FY 18 and Cargo movement growth at 8.74% CAGR FY 15 & FY 18.
- The total Operational and Maintenance costs incurred by MIAL during Second Control Period was ₹ 3,997.41 crores.
- Based on the nature and description of the costs, the same was classified as Aeronautical and Non-aeronautical in accordance with Schedules 5 and 6 of OMDA respectively.
- Segregation logics were determined for appropriate segregation of Common costs in to Aeronautical and Non-aeronautical categories. Accordingly, common costs have been segregated using an appropriate cost driver. In the absence of the most appropriate cost driver:
    - Common cost of terminal operations is apportioned based on the weighted average terminal floor space ratio viz., 87.30%
    - Corporate Overheads are apportioned based on the adjusted gross fixed assets ratio viz., 82.58%: 17.42%
- Post re-classification and other adjustments of ₹ 252.67 crores made based on this Report, the above total operational and maintenance expenses of ₹ 3,997.41 crores have been segregated as under:
    - Adjusted Aeronautical expenses: ₹ 3,468.43 crores
    - Non-aeronautical expenses: ₹ 528.98 crores.
- Based on the above methodology, the General principles have been defined in Table 6 of this report for classification of each expense and the logics for apportionment of common expenses in to Aeronautical and Non-aeronautical categories.
- With a passenger traffic growth of 9.84%, employee cost per passenger has reduced at 3.85% (CAGR) due to economy of scale and efficiency in operations.
- In order to determine the efficient baseline costs, we have made a detailed study of MIAL's costing system, budgetary process, and process efficiency improvement initiatives undertaken.
- Trend analysis for the Second Control Period was performed to determine efficiency of costs (adjusted with general price level changes to remove inflationary effect) incurred by MIAL over a period. Overall, the increase in operational costs were in consonance with the steady increase in passenger traffic/ air-craft movements.
- Operation and Maintenance costs of MIAL was benchmarked with comparable domestic and international airports over the duration of the Second Control Period to assess MIAL's performance. Overall analysis indicated that MIAL's costs are comparatively lower than its peers in the sample selected for international benchmarking. Compared to the domestic benchmark, MIAL has achieved efficiency gains by controlling growth in costs on a per passenger and ATM basis.
- Airport Service Quality (ASQ) assessment of MIAL for the period ending 31 March 2019 based on various factors such as *Access, Check-in, Security, Passport/Personal ID control, Airport facilities, Arrival services, Overall satisfaction etc.* showed that the average ASQ rating for domestic was 4.81 and international was 4.80, out of a maximum possible rating of 5.

MUMBAI INTERNATIONAL AIRPORT LIMITED
STUDY ON EFFICENT OPERATION AND MAINTENANCE COST
ANNEXURE - 1: LIST OF COST CETRE AND PRIMARY COST ALLOCATION DETAILS

S. No	Name	Nature	Primary Cost Allocation				
			FY 15	FY 16	FY 17	FY 18	FY 19
1	Landing	Revenue Generation Centre	49.44	218.73	330.68	445.92	429.97
2	Parking Charges	Revenue Generation Centre	28.76	17.52	47.30	54.96	99.13
3	Aero Bridge Charges	Revenue Generation Centre	3.19	29.15	47.33	51.76	52.18
4	UDF	Revenue Generation Centre	-	177.82	118.03	34.27	41.27
5	Fuel Handling	Revenue Generation Centre	-	-	-	-	-
6	Flight Kitchen	Revenue Generation Centre	-	-	-	-	-
7	Ground Handling	Revenue Generation Centre	-	-	-	-	-
8	Car Parking	Revenue Generation Centre	-	-	-	-	-
9	Advertisement	Revenue Generation Centre	0.10	-0.02	0.02	0.04	-0.01
10	Hangar Rent	Revenue Generation Centre	-	-	-	-	-
11	Terminal Build Rent	Revenue Generation Centre	-	-	-	-	-
12	Cargo	Revenue Generation Centre	23.45	4.89	6.06	7.40	6.32
13	Others	Revenue Generation Centre	0.10	-0.58	-	-	-
14	Power	Supporting Centre	1.68	96.90	109.22	183.97	179.77
15	Airside	Supporting Centre	44.55	30.19	33.07	34.59	36.69
16	Terminal 1	Supporting Centre	3.22	3.15	-	-	-
17	Terminal 2	Supporting Centre	14.93	11.56	-	-	-
18	Cargo	Supporting Centre	16.31	4.03	11.55	7.93	15.80
19	Corporate Office	Supporting Centre	-	0.23	0.16	2.60	0.08
20	ATC	Supporting Centre	-	-	-	-	-
21	CAT	Supporting Centre	2.07	2.27	1.49	1.70	1.69
22	T2 MLCP	Supporting Centre	1.48	6.52	7.15	0.78	0.36
23	T1 Carpark	Supporting Centre	0.08	-	-	-	-
24	T2 STP	Supporting Centre	0.07	4.70	4.89	5.13	2.58
25	T1 STP	Supporting Centre	-	-	-	-	-
26	T1 Landside	Supporting Centre	-	0.35	-	-	-
27	T2 Landside	Supporting Centre	-	-0.06	-	-	8.14
28	Engineering and Maintenance	Supporting Centre	-	0.20	-	-	-
29	Contracts and Procurement	Supporting Centre	0.14	-	-	-	-
30	Facilities	Supporting Centre	-	2.24	-	-	-
31	Security	Supporting Centre	3.42	14.59	25.24	35.45	20.34
32	Information Technology	Supporting Centre	6.59	6.35	6.25	4.81	4.53
33	Horticulture	Supporting Centre	-	-	-	-	-
34	HR & Admin	Supporting Centre	1.87	1.58	1.64	2.03	3.07
35	Stores Department	Supporting Centre	-	0.17	0.11	0.12	-
36	Accounts and Finance	Supporting Centre	0.75	0.59	0.55	0.66	0.56
37	Marketing and Aero Business	Supporting Centre	-	-	-	-	-
38	Commercial	Supporting Centre	3.56	4.88	4.19	2.87	2.91
39	Real Estate	Supporting Centre	3.76	5.91	6.54	7.62	4.87
40	Fire & Safety	Supporting Centre	1.12	1.20	0.85	0.91	2.70
41	Airport Common	Supporting Centre	76.89	83.97	81.84	90.78	88.32
42	Aero Common	Supporting Centre	704.31	222.38	297.00	241.10	328.70
43	Non Aero Common	Supporting Centre	50.91	61.77	82.69	85.56	119.52
44	Corporate Overheads	Supporting Centre	54.99	87.07	78.17	76.13	83.82