ANALYSIS OF CAPITAL EXPENDITURE ON EXPANSION FOR THIRD CONTROL PERIOD AT RAJIV GANDHI INTERNATIONAL AIRPORT, SHAMSHABAD, HYDERABAD

EVALUATION REPORT

APRIL 2021

RITES LTD
AIRPORTS DIVISION,
PLOT No. 144, SECTOR 44 GURGAON

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LIST OF ABBREVIATIONS

AERA	Airports Economic Regulatory Authority of India
AAI	Airports Authority of India
ATM	Air Traffic Movement
GoI	Government of India
GHIAL	GMR Hyderabad International Airport Limited
HIAL	Hyderabad International Airport Limited
IMG	Inter-Ministerial Group
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IRA	Independent Regulatory Authority
MARS	Multiple Aircraft Ramp System
MoCA	Ministry of Civil Aviation
MPPA	Million Passenger per Annum
Mn	Million
MYTP	Multi-Year Tariff Proposal
PPP	Public Private Participation
PHP	Peak Hour Passenger
TRB	Transport Research Board
UDF	User Development Fee
WPI	Whole sale price Index

1. INTRODUCTION

1.1. BACKGROUND

Development of New Greenfield International Airport at Hyderabad through PPP mode was awarded to Hyderabad International Airport Limited (HIAL) and the concession agreement was signed between HIAL and the Ministry of Civil Aviation (MoCA) on 20th December 2004. The Airport was commissioned in 31 months and designed for a capacity of 12 million passengers per annum (MPPA) and 1,50,000 tons of cargo handling capacity per annum. The airport was inaugurated on 14th March 2008 and started the commercial operations from 23rd March, 2008.

Salient features of the concession agreement relevant to this report are highlighted below:

- **Nature of Agreement**

  Concession agreement for Development, Construction, Operation and Maintenance of Hyderabad International Airport between Ministry of Civil Aviation - Government of India and Hyderabad International Airport Limited

- **Concession**

  GoI granted HIAL, the exclusive right and privilege to carry out the development, design, financing, construction, commissioning, maintenance, operation and management of the Airport (excluding the right to carry out the Reserved Activities and to provide communication and navigation surveillance / air traffic management services which are required to be provided by AAI)

- **Scope of the Project**

  Development and Construction of the Airport on the site in accordance with the provisions of the agreement, Operation and maintenance of the airport and performance of the Airport Activities and Non-Airport Activities in accordance with the provisions of the agreement, performance, and fulfilment of all obligations of HIAL in accordance with the provisions of the agreement

- **Fee**

  HIAL shall, in consideration for the grant by GoI of the Concession pursuant to Article 3.1, pay to GoI a fee amounting to four per cent (4%) of Gross Revenue annually on the terms specified.

- **Charges**

  The Airport Charges specified in Schedule 6 (Regulated Charges) shall be consistent with ICAO (International Civil Aviation Organization) Policies. The Regulated charges set out in Schedule 6 shall be indicative charges. Prior to Airport Opening HIAL shall seek approval from the Ministry of Civil Aviation for the Regulated Charges, which shall be based on the final audited project

cost. From the date the Independent Regulatory Authority (IRA) has the power to approve the Regulated Charges, HIAL shall be required to obtain approval thereof from the IRA.

- **Term:** 30 years

The shareholding pattern of GMR Hyderabad Airport Limited as on date is as under:

GMR Airports Limited, Holding Company	-	63%
Airports Authority of India	-	13%
Government of Telangana	-	13%
MAHB (Mauritius) Private Limited	-	11%

1.2. SCOPE OF SERVICES

Post Inauguration in 2008, Hyderabad Airport has seen significant growth in passenger traffic and freight supported with the city turning into a major hub for services sector. To match the capacity of the Airport with the growing traffic, GHIAL submitted the expansion plan of terminal building and Apron facility at Hyderabad International Airport to AERA for second control period (01/04/2016 to 31/03/2021). Subsequently, AERA had appointed RITES vide letter dt. 12th June 2017 to examine the same. The report was submitted by RITES to AERA in Sept 2017. This report had discussed CAPEX proposal for increasing the capacity of the Airport from 12 MPPA to 20 MPPA.

GHIAL has now submitted the proposal for Capital Expenditure for expansion for the combined second and third control period (01/04/2016 to 31/03/2026) for enhancing the capacity of the Airport from 12 MPPA to 34 MPPA, to AERA. RITES has been engaged by AERA for evaluation of this follow up proposal vide letter dated 04th Dec 2020.

The scope of services assigned to RITES for the present study include:

a) To examine the proposal of the airport and assess the need for the proposed project and its capacity/scope with reference to Passenger growth upto 34 MPPA /Cargo Volumes/Air Traffic Movement and also to suggest cost effective alternatives.
b) To examine the building standards and designs proposed by the airport operator in line with IMG norms/IATA/ICAO norms.
c) To analyze the reasonableness of the proposed cost with reference to the tentative ceiling decided by Authority vide order no. 7 dated 13/06/2016 based on the details of the rates and quantity as per government/industry approved norms and advise the Authority on the reasonableness of the costs.
d) To review designs and specifications proposed in case the costs are assessed to be excessive where the Projects are already in progress or the contracts are already awarded. Further to examine whether proper procedures have been followed in the award of the work.
e) To assist AERA in case any litigation arises in future in connection with the reasonableness of the cost estimates.

f) To review and justify the reasonableness of time schedule of completion of work of proposed by HIAL.

g) To perform any other duties as may be deemed necessary and specified in the award letter.

1.3. THE STUDY TEAM

The following team has been formed by RITES to undertake the assignment:

Table 1.1 RITES Team Members undertaking the assignment

SN	Name	Designation
1.	Mr. Rakesh Kapoor	Executive Director / Airports
2.	Mr. B S Sehrawat	Group General Manager/Airports
3.	Mr. Abhas Kumar	Jt. General Manager/Airports
4.	Mr. Anil Aswani	Jt. General Manager/Airports
5.	Mr. V. S. Solanki	Sr. Dy. General Manager/Airports
6.	Mr. Prateek Dhingra	Manager/Airports
7.	Mr. Saurabh Pareek	Manager/Airports
8.	Mr. Vivek Rai	Assistant Manager/Airports

1.4. DATA COLLECTION

After various email communications between RITES, GHIAL & AERA on dates 09/12/2020, 16/12/2020, 31/12/2020, 07/01/2021, 22/01/2021, 01/02/2021, 16/02/2021 & 18/02/2021, the following data has been received and studied:

- Airport Expansion & Capex Proposal, Project Information File (PIF) for Airport Users Consultation, August 2018 submitted by GMR Hyderabad International Airport Limited
- Concession Agreement for the Development, Construction, Operation and Maintenance of the Hyderabad International Airport between Ministry of Civil Aviation, Government of India and Hyderabad International Airport Limited dt. 20th Dec. 2004
- Order No. 07/2016-17 dt. 13th June 2016 issued by AERA in the matter of Normative Approach to Building Blocks in Economic Regulation of Major Airports –Capital Costs Reg.
- Letter No. GHIAL/2020-21/SPG/1490 dt. 16th December 2020 by GMR forwarding the descriptions for the various elements of the project.
- General Capital Expenditure For the combined 2nd and 3rd control period.
- Bureau of Civil Aviation Security Circulars.
- Detailed airfield pavement analysis at Rajiv Gandhi International Airport Hyderabad.
- Minutes of AUCC meetings of stakeholders held on 07/10/2018 on Airport Expansion & Capex Plan GHIAL.
- Multi Year Tariff Proposal for the third control period (1st April 2021 to 31st March 2026).
- Independent Auditor's Report on the Audit of Special Purpose Financial Statements for the year ended 31 March 2020.

- Reserve Bank of India circular dt. 14/08/14 on prudential norms on income recognition, asset classification and provisioning pertaining to advances – Projects under implementation.
- Geo technical investigation report by Geo Technologies, Nov – Dec 2016
- Planned Work Schedule submitted by GHIAL.
- RGIA master plan development update report March 2018.
- Project expansion Cost summery and area statement details with PO summery.
- Final Report on Hyderabad International Airport Traffic Study by ICF Limited, March 2018.
- Master Plan Review 2016, Final Report, RGIA by Landrum-Brown, April 2017.
- Request made by various Airlines for night parking.
- Details of procedure followed in the award of major works.
- Some lumpsum details of preliminaries, insurance, Design & PMC and contingency.
- Details for considering the inflation, GST etc.

1.5. DISCUSSIONS WITH AERA

During various interactions with AERA, following have been noted:

- That, as per their assessment, traffic at the end of third control period i.e. FY 2025-26, in the Post-Covid scenario, is likely to be 26.85 MPPA. Traffic estimations by GHIAL in the Pre-Covid & Post-Covid scenarios for the FY 2025-26 have been 34 MPPA and 31.4 MPPA respectively.
- That, CAPEX requirements to be evaluated for the aforesaid three traffic scenarios.
- That, in order to optimize the CAPEX requirements for the third control period, keeping in view the reduction in traffic, possibility of shifting the proposed development /CAPEX beyond the third control period may be examined.
- That, through an email dated 07.04.2021, GHIAL has submitted certain clarifications pertaining to the updated status of award of CAPEX works, reasons for increase in IT CAPEX from Rs. 48.9 Cr for 2nd CP to 247 Cr for combined 2nd & 3rd CP and the cost of PMC & design services.

The above have been taken into consideration while evaluating the CAPEX proposal.

1.6. REPORT

This report sets out the evaluation by RITES Ltd of the need for expansion of existing infrastructure and capital cost thereof at Hyderabad International Airport on behalf of the AERA as per scope of RITES. This exercise is undertaken to assist AERA in assessment of capital expenditure. It is important to note that the findings and outputs are provisional, and that the capacity analysis is subject to consultation and refinement.

The remainder of this report is structured as follows. Section Two describes briefly the Proposal submitted by GHIAL; Section Three, Analysis of the Air Traffic; Section Four, the Governing parameters; Section Five, the Evaluation of the proposal and Section Six, the Findings.

2. PROPOSAL BY GHIAL

2.1. EXPANSION PROPOSAL

The submission made by GHIAL has been provided to RITES by AERA. The major components of the proposed capital expenses as per PIF of GHIAL include the following heads:

- **Terminal Forecourt**
  - Expansion of Airport Forecourt leading to additional space of 12,095 Sqm.
  - Provision of 8 entry gates.
  - Central opening at departure level by infilling the space between the two connecting bridges.
  - Increasing the circulation space at Airport Forecourt departure level by providing a cantilever slab on the south side of ramp.

- **Expansion of the terminal**
  - East-side expansion by 60 m, leading to additional space of 27,914 Sqm.
  - West-side expansion by 190 m, with additional space of 69,703 Sqm.

- **Pier Expansion**
  - East-side pier expansion (addl. space of 69,020 Sqm) to accommodate 16 contact stands.
  - West-side pier expansion (addl. space of 70,077 Sqm) to accommodate 17 contact stands.

- **Airside Infrastructure Augmentation**
  - Apron expansion on West-side covering an area of 237,565 Sqm for stands and access taxi provision. Construction of contact stands about 33 nos, in and around Terminal & Remote stands of about 52 nos.
  - Addition of 2 new RETs.
  - Construction of the second parallel Taxiway (Txy-B) from the existing stretch available at Cargo Stand to the full extent possible.
  - 3 lane wide tunnel linkage of about 250 m length to provide seamless connectivity between remote stands & the terminal.

- **Expansion of the approach ramp & Kerb**
  - 8 laning of the departure Ramp & 7 laning of Arrival Ramp.
  - Lengthening of the kerb to 300 m from current 210 m to correspond to a larger terminal processor building.

- Expansion of the departure & arrival approach road to Ramp from current 2 lane to 3 lanes.

- **Allied Infrastructure**
  - Construction of 3 additional fuel farm tanks of 6500 KL each.
  - An elevated flyover to cross the central roadway for the airport bound traffic from the west side.
- **Technological advancements**
  - Upgrade all the screening lane system to ATRS screening lane SBDs, Smart lighting, paper less boarding, self-bag drop, ICT Equipment/Systems, augmentation of Common facilities such as HVAC, BHS, Check-in counters, Security Screening, Toilets, PHE System, etc. as required.

The expansion proposal of GHIAL is summarized as under:

Table 2.1 Expansion Proposal of GHIAL

Capacity Requirements	Design Capacity 12 Million	Design Capacity 20 Million	Design Capacity 34 Million
Peak ATM (Approved peak movement is 33 ATM/hr)	**20**	**34**	**51**
Peak (Departure)	**1,836**	**3,244**	**6,830**
Combined peak	**2,855**	**5,059**	**14,691**
Arrival ramp capacity (Cars/Peak Hr.)	**600**	**1,100**	**2,899**
Departure ramp capacity (Cars/Peak Hr.)	**1,100**	**2,000**	**3,587**
Check-in Islands	**2 Islands (30 Counters each)**	**5 Islands (30 Counters each)**	**7 Islands (22 Counters each)**
In Line Baggage check-in counters	**60**	**150**	**154**
Emigration counters	**22**	**33**	**48**
Immigration counters	**20**	**38**	**50**
Total X-Ray channels required	**8+4 (swing)**	**23**	**29 (ATRS)**
Aircraft apron stands	**42**	**52**	**101 (incl. night parking stands)**
Domestic contact gates	**5**	**17**	**21**
International contact gates	**7**	**12**	**24 (4 Nos will be swing)**
Total contact stands	**12**	**29**	**45**
Baggage carousals/claim unit_ Intr. (90m)	**2**	**4**	**6**
Baggage carousals/claim units_ Dom (90m)	**2**	**3**	**9 (1 will be swing)**
Total baggage carousals/claim	**4**	**7**	**15**
Self Service/ E-boarding	**NA**	**16 (E-gates) 10 (Self bag drop)**	**E-boarding: 68 E-gates-20 at entry lanes, 88 Self bag drop**

Source: PIF report

2.2. CAPITAL COST PROPOSAL

The total capital cost for expansion of the airport during the second control period was estimated by GHIAL for Rs. 1989.00 Crores and for third control period it is estimated for Rs. 3486.8 Crores inclusive of insurance & permits, preliminaries, design development, PMC and contingencies during construction as per the breakup given below.

The table below shows consolidated cost estimates for the capacity augmentation from 12 MPPA to 20 MPPA and subsequently from 20 MPPA to 34 MPPA as composite project cost mentioned in PIF as submitted by GHIAL.

Table 2.2 Projected Capital Expenditure by GHIAL- Rs in Cr taken from PIF report

SN	Particulars	Estimated Capex (12 to 20 MPPA)	Estimated Capex (Incremental capacity 20 to 34 MPPA)	Total Capex (capacity 12 to 34 MPPA)	Remarks
1	Expansion of the Terminal Building	1400.9	1959.9	3360.8	Increase in Terminal Area from earlier proposed 101,175 Sqm for 20 MPPA to 248,809 Sqm for 34 MPPA along with increase in airport systems for enhanced capacity
2	Expansion of the Kerb & Approach ramp	108.5	-	149.0	Based on discovered price of the contract
3	Expansion of Apron & Taxiways	129.4	777.6	907.0	Increase in rigid apron area from earlier proposed 46,000 Sqm for 20 MPPA to 237,567 Sqm to meet additional stand requirements. Increase in earlier proposed taxiway area from 72, 734 Sqm for 20 MPPA to 464,631 Sqm for 34 MPPA on account of requirement of parallel taxiway (2350 mt), RETs and other service road. Additional cost for 3 lane wide tunnel linkage of about 250m length for connectivity between remote stands and terminal
4	Road Infrastructure	0.0	167.0	167.0	Towards 8 Laning of 5 Km stretch of Main Access Road to Departure Junction

SN	Particulars	Estimated Capex (12 to 20 MPPA)	Estimated Capex (Incremental capacity 20 to 34 MPPA)	Total Capex (capacity 12 to 34 MPPA)	Remarks
5	ICT Cost	48.9	227.5	276.4	Towards ICT Equipment/Systems
Sub- Total		**1687.7**	**3132.0**	**4860.2**	
6	Preliminaries	34.0	63.2	97.2	
7	Insurance & Permits	20.0	52.9	72.9	
8	Design & PMC	142.2	100.8	243.0	
9	Contingencies	105.1	137.9	243.0	
	Total	**1989.0**	**3486.8**	**5516.3**	

Note: The above CAPEX estimates are taken from PIF report submitted by GHIAL.

Note: In reference to above data, the GHIAL has submitted details of cost breakup of Rs. 5596.23 Crores as given below for combined 2nd and 3rd control period and the same have been considered by RITES for CAPEX evaluation.

Table 2.3 Details cost breakup of Capital Expenditure received from GHIAL

GHIAL Projerct Expansion Rs Crs

SN	Particulars	Revised Budget submitted to AERA	Awarded Contract (B)							Balance to be awarded
			L&T	MW	MVR	VNC	Beumer India	Others	Total Pos issued	
		A							B	C=A-B
1	Expansion of the Terminal Building	2,658.32	2343.44					72.20	2,415.65	242.67
2	Airport Systems	1,070.00		875.04			138.32	15.67	1,029.03	40.97
3	Expansion of the Kerb & Approach Ramp	156.40				146.77		0.98	147.75	8.65
4	Expansion of Apron & Taxiways	895.66	637.73		142.70	58.98		18.11	857.55	38.13
5	Road Infrastructure	167.00				24.23			24.23	142.77
6	GSE Tunnel	82.80	82.80						82.80	-
	Sub- Total (INR Cr.)	**5,030.18**	**3,063.98**	**875.04**	**142.70**	**229.99**	**138.32**	**106.96**	**4,556.99**	**473.19**
7	Preliminaries , Insurance & Permits	120.1						26.51	26.51	93.59
8	Design Development & PMC	202.94						193.51	193.51	9.43
9	Contingencies	243.01						-	-	243.01
	Total	5,596.23	3,063.98	875.04	142.70	229.99	138.32	326.98	4,777.01	819.22

3. TRAFFIC REVIEW

3.1. PROJECT INFORMATION FILE OF GHIAL

The extracts of Project Information File submitted by GMR Hyderabad International Airports Ltd. for August 2018, are as under:

- The airport presently has a design capacity of 12 MPPA and cargo handling capacity of 150,000 MTPA. Over the decade, Passenger traffic has grown from 6.2 million passengers in FY2009 after the airport opened, to 18.3 million passengers in FY2018 (CAGR of 12.8%).
- Earlier in 2015, GHIAL conducted AUCC process (Stakeholder meet) for 20 MPPA expansion and the existing proposal is for 34 MPPA. During the meeting the GHAIL informed to stakeholders that in order to address the growth, the earlier plan of enhancing the capacity to 20 MPPA is revised to 34 MPPA as brought out from the study of L&B , NATS and ICF. Minutes of AUCC are attached at Annexure 1.
- GHIAL is proposing capacity expansion to 34 million to cater to the growth in its 3rd control period.
- GHIAL has relied upon the forecast of ICF Limited, UK, which projected traffic throughput of 34 million by FY2023-24 at a CAGR of 11.3%.
- In view of the projected traffic growth, GHIAL is now contemplating to increase the terminal capacity to 34 million.
- Existing passenger terminal has the capacity to handle only combined peak of 6400 PHP (peak hour passenger) (3200PHP capacity for Departure & Arrival respectively), while as per the current traffic in FY 2017-18, the combined PHP traffic has surpassed 6609 PHP.
- As per projections given in PIF, peak hour traffic shall touch 11511 PHP by FY 2020-21 and 14691 PHP by FY 2023-24.
- To cater to increased traffic and requirements of night parking, total stand requirement as per the traffic will be 101 Apron stands.
- The demand for aircraft stands would grow from current 42 Nos to 101 Nos at 34MPPA.
- Additions of 33 new contact stands are proposed with 16 in domestic and 17 in international zone. This will take overall contact gates numbers to 45 including 7 MARS stands.
- The emigration counter requirement projections indicate that the current provision of 22 counters (which include 2 supervisory counters) is constrained as per current traffic. Beyond this, we need to expand the emigration area to add minimum of 26 more counters to sustain traffic until FY2023-24.
- For catering to demand till FY2023-24, it will require to add minimum of 6 claim belt of 90m baggage claim for domestic and 4 Claim belts of 90m for International.

3.2. HISTORIC TRAFFIC HANDLED AT THE AIRPORT

It has been observed that the year on year (YoY) growth rate in international passengers has declined from 15% in FY 2015 to 8% in 2019, while the domestic and total passenger growth remained at nearly 20% mark since 2015 till 2019. In contrast, in FY 2020 minor decline in International traffic of the order of 2% was witnessed while the domestic traffic grew marginally by 2%.

During the following year i.e., during FY 2021, the operations remained largely closed owing to nationwide restrictions due to COVID-19. Post lifting of restrictions, the air travel has witnessed significant recovery.

The total passenger traffic handled by the airport in the FY 2020 stood at 21.65 million as against the unconstrained forecast of 25 million passengers. The international passengers handled remained at 3.91 million and the domestic 17.73 million as against the forecast of 5 million and 20 million respectively.

The year on year (YoY) growth rate in international Air Traffic Movement (ATM) has reached to maximum 13 % in the year of 2016 from 9% in the year of 2015 and then it declined to 4% in the year of 2019. Domestic ATMs and total ATMs have witnessed growth trend varying between 12 % to 27% over the 4-5 years since 2014. International ATM also grew at a steady rate of nearly 10% over the same period. The ATM growth in the last financial year (FY2020) followed the same pattern as that of total passenger growth rate.

The total Air traffic movement handled by the airport in the FY 2020 stood at 183.45 thousand as against the unconstrained forecast of 201 thousand. The international ATM handled remained at 25.75 thousand and the domestic 157.69 thousand as against the forecast of 30 thousand and 167 thousand million respectively.

The Cargo ATM is growing very slowly, and it varies between 02 thousand to 03 thousand in the year of 2016 to 2019 and the forecasted Cargo ATM in the year of 2020 is 03 thousand.

It also has been observed from the historic data that the year on year (YoY) growth rate of total Freight handled in MT has decline continuously from 14% in FY 2015 to 7% in 2019. In FY2020 total freight transported remained stagnant at the same figure as that of 2019, while domestic freight increased the international freight decreased by almost the same rate resulting in total freight growth rate of 0%.

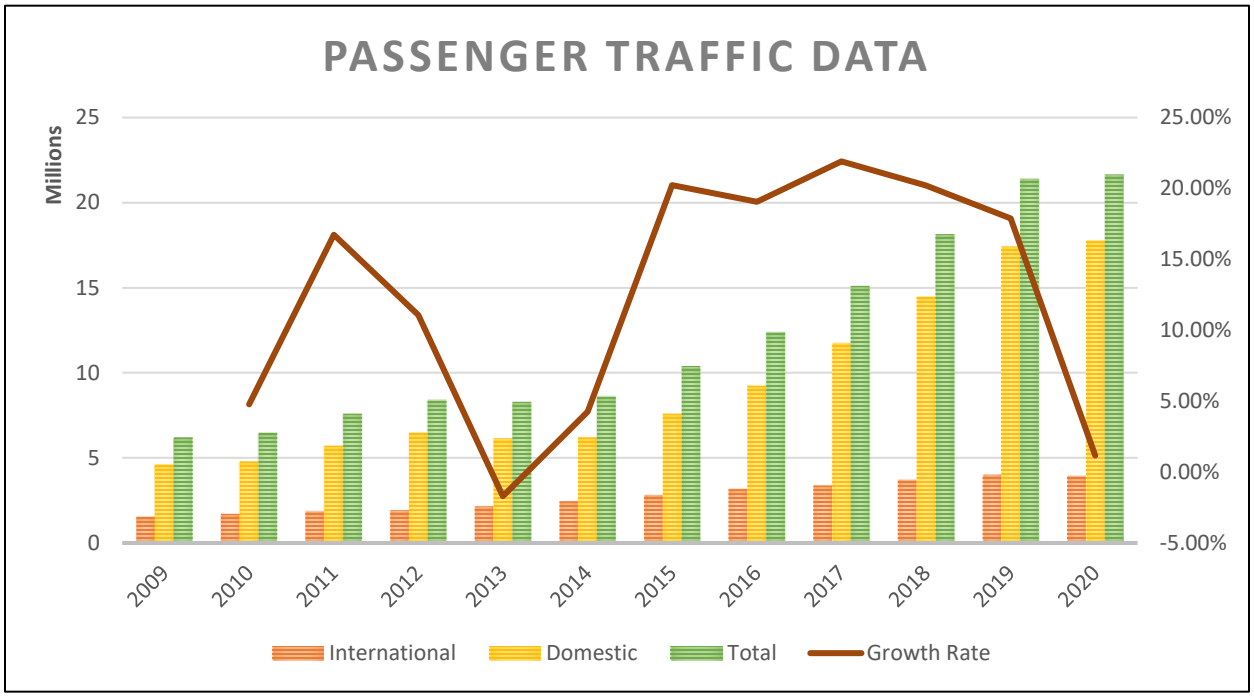

Figure 3-1 Historic Passenger Traffic Growth Rate

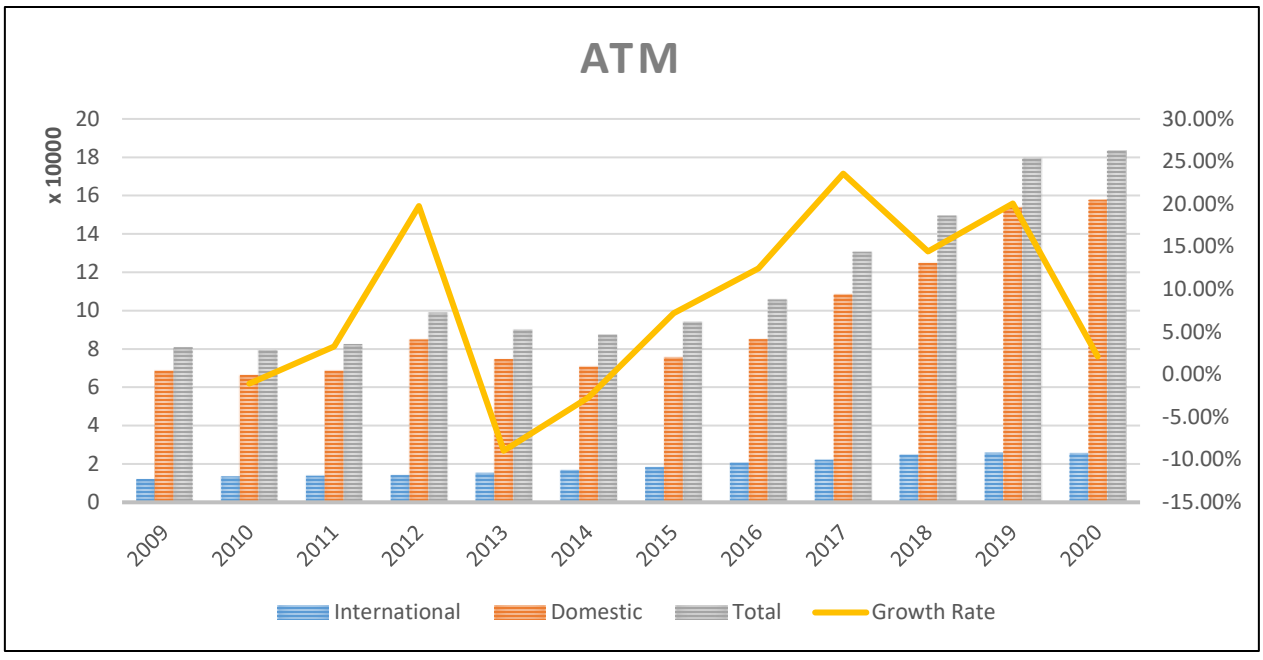

Figure 3-2 Historic Air Traffic Movement Growth Rate

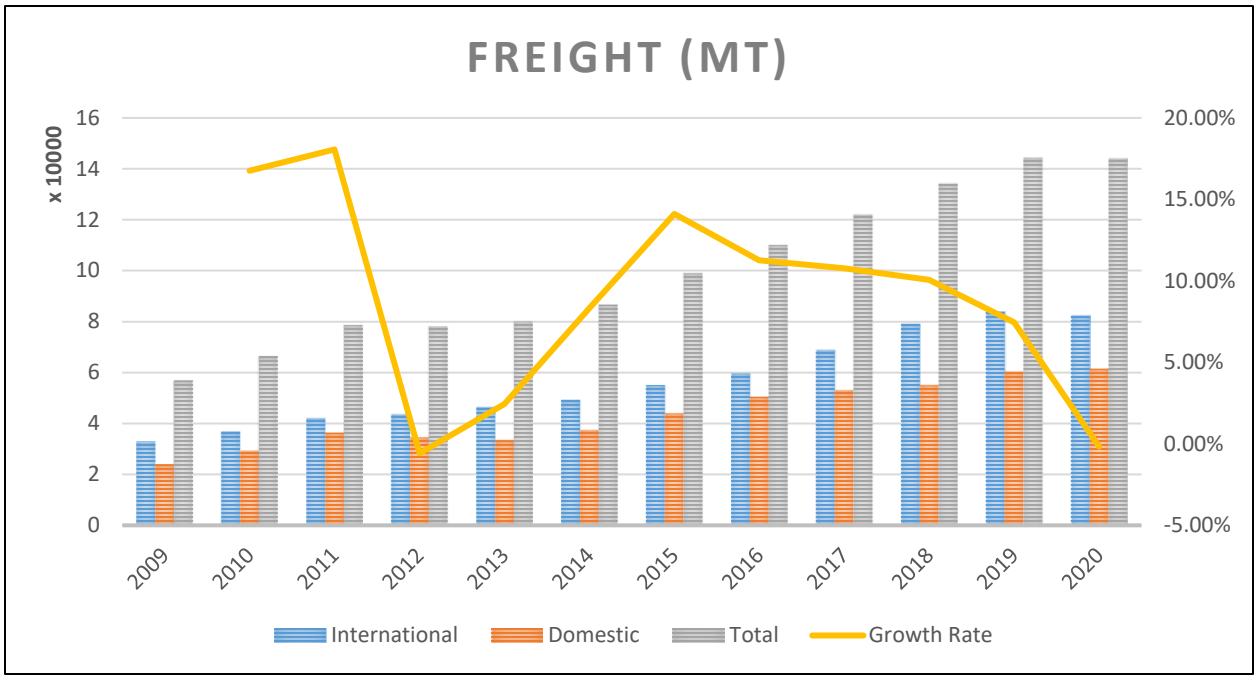

Figure 3-3 Historic Air Cargo Growth Rate

As per the traffic data available for the current Financial Year (FY 20-21), till Jan 2021 from AAI traffic report, the air traffic is on the path of recovery. The comparison of the passenger traffic for Hyderabad International Airport for Financial Year 2019-20 (FY19-20) and FY 20-21 has been reproduced below.

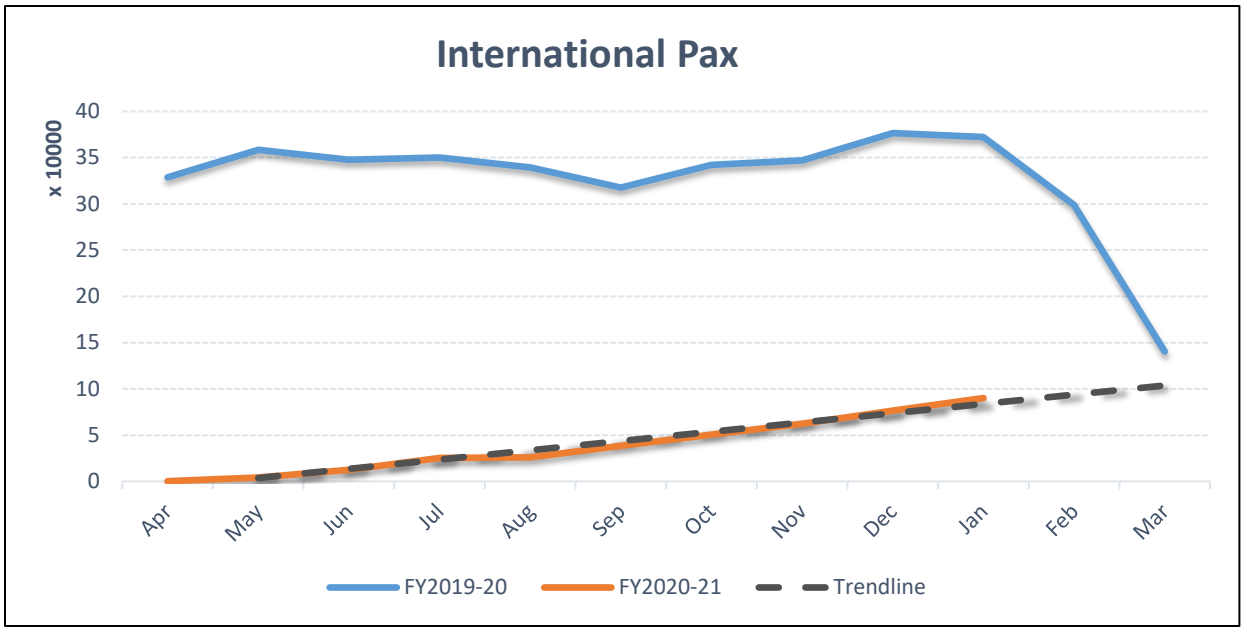

Figure 3-4 Comparison of International Passenger Traffic

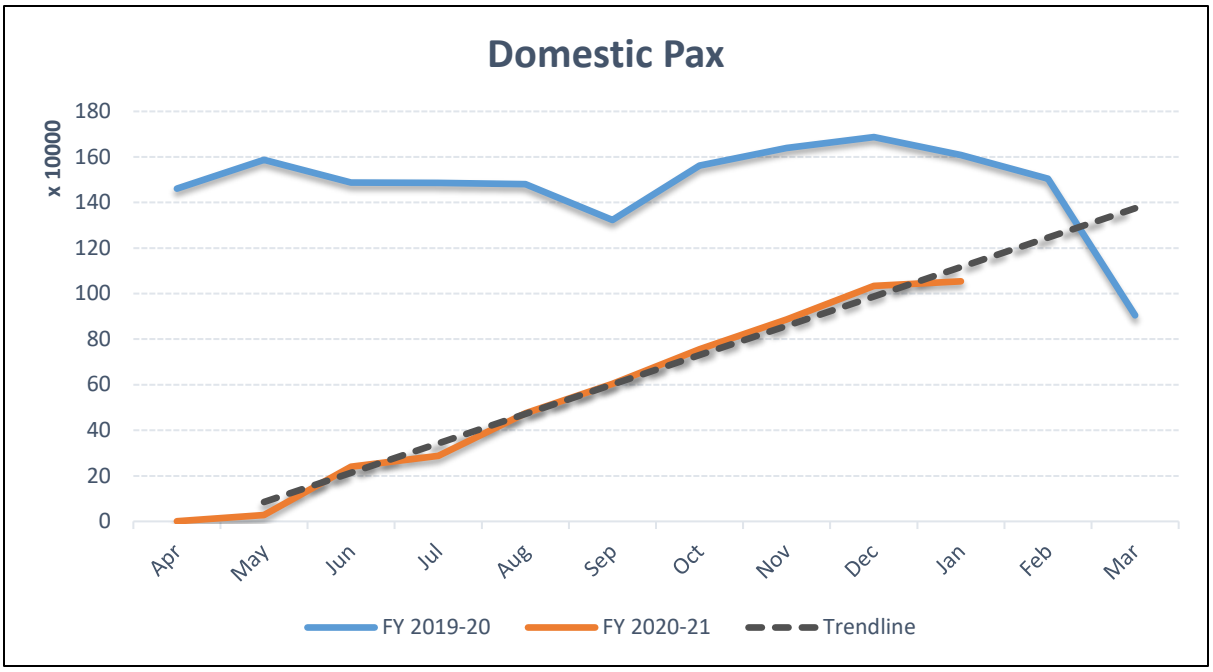

Figure 3-5 Comparison of Domestic Passenger Traffic

3.3. AIR TRAFFIC FORECAST BY ICF LIMITED AND GHIAL

ICF base case, forecasts unconstrained passenger volume reach to 61 million by 2038 at a CAGR of 6.9% from 2017. The growth rate adopted is as given below:

Segment	FY17-22	FY17-28	FY17-38
Domestic	13.7%	9.8%	6.9%
International	11.4%	9.4%	6.8%
Total	**13.2%**	**9.7%**	**6.9%**

Source: ICF

Figure 3-6 Air Traffic Passenger Forecast by ICF

Similarly, as per ICF, ATM forecast which sees annual movements increase from 131k in 2017 to 435k by 2038, at a CAGR of 5.9%.

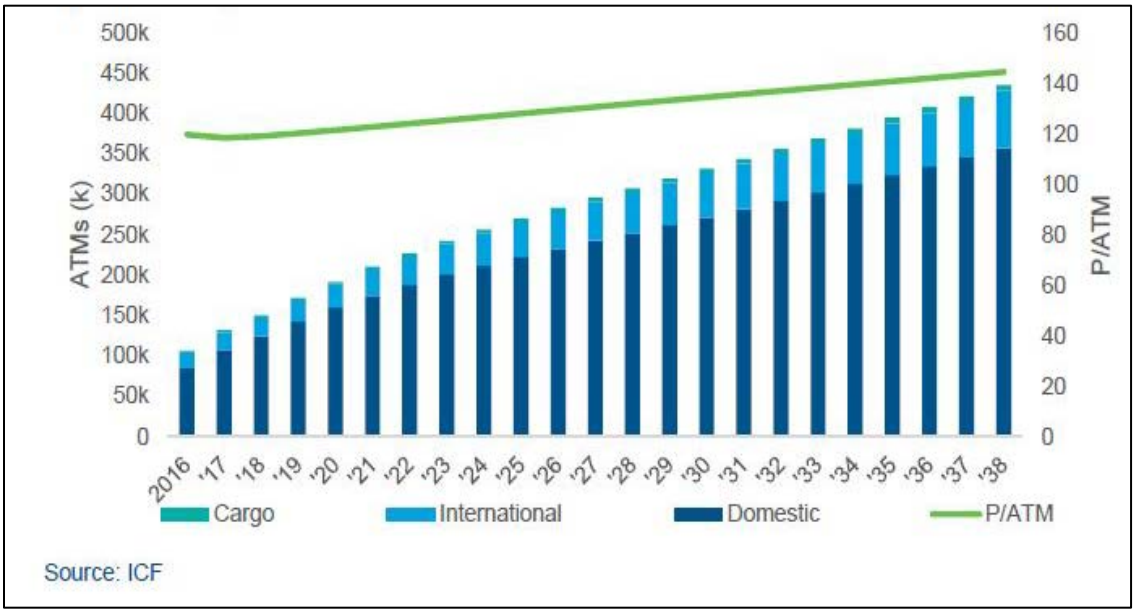

Figure 3-7 Air Traffic Movement forecasted by ICF

As per the forecast study undertaken by GHIAL post COVID, the passenger traffic (domestic + International) will reach 9.8 million by FY 2021 in contrast to the more than 21 million pax for the FY2020. FY2022 is expected to witness unprecedented recovery in passenger traffic clocking a growth rate of 109% YoY. The growth rate will be abated over the years to follow, reaching 17% in 2023 and 7% in 2026. The total passenger traffic project by GHIAL by the end of FY 2026 is 31.4 million in contrast to the 37 Million pax as originally projected by ICF in case of unconstrained growth.

As per traffic forecast in Multi Year Tariff Proposal submitted by GHIAL, according to IATA, it is estimated that the global GDP growth to fall by around 5% this year, before rebounding, and returning to its 2019 level in 2021. To put this decline into context, it is around 4x larger than that of the global financial crisis, where world GDP fell by 1.3% in 2009. In contrast, the expected decline in air passenger volumes is much more severe, with a decline of around 50% in 2020. The recovery is such that a return to the level of 2019 does not occur until 2023, taking around two years longer than global GDP as per IATA

ICF is of the view that domestic and intra-regional traffic would take 4 years and international 5.4 years respectively to recover Pre-Covid 2019 traffic. Although each country would have to deal with economic recession and Post-Covid behavioral changes, however, ICF projected a relatively faster recovery ranging between 3.8 years to 4 years in Asia Pacific region.

The traffic forecast as per projections by GHIAL considering the COVID effect has been reproduced below.

Table 3.1 Post-Covid Passenger Traffic forecast by GHIAL

Passenger Traffic:

Financial Year (Mn.)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
International Traffic	3.9	1.4	3.4	4.5	5.0	5.5	5.8
Domestic Traffic	17.7	8.4	17.1	19.5	22.0	24.0	25.6
Total	**21.6**	**9.8**	**20.4**	**23.9**	**27.0**	**29.5**	**31.4**
Billable Pax*	**21.3**	**9.7**	**20.2**	**23.7**	**26.7**	**29.1**	**31.1**
Int growth %	-1.7%	-63.9%	141.2%	34.0%	11.5%	10.0%	5.8%
Dom growth %	1.7%	-52.6%	103.4%	13.8%	13.0%	9.0%	6.7%
Total growth %	1.0%	-55%	109%	17%	13%	9%	7%

Table 3.2 Post-Covid Air Traffic Movement forecast by GHIAL

ATM:

Financial Year	2020	2021	2022	2023	2024	2025	2026
International (nos)	25752	11074	20678	27463	30462	33432	35079
Domestic (nos)	157999	84601	164374	184846	207323	224415	238219
Total	183751	95675	185052	212309	237785	257847	273299
Int growth %	-0.50%	-57.00%	86.73%	32.81%	10.92%	9.75%	4.93%
Domestic growth %	2.46%	-46.45%	94.29%	12.45%	12.16%	8.24%	6.15%
Total growth %	2.03%	-47.93%	93.42%	14.73%	12.00%	8.44%	5.99%

Table 3.3 Post-Covid Cargo Volume forecast by GHIAL

Cargo Tonnage:

Financial Year (MT)	2020	2021	2022	2023	2024	2025	2026
Total Cargo volume ('000 mt)	146	86	136	145	162	177	190
% Growth	-1.25%	-41.00%	58.15%	6.00%	11.72%	9.73%	7.11%

If the above figures are compared to the traffic data available till Jan 2021, it is apparent that realization of such figures would require significantly higher recovery in passenger traffic than witnessed in the previous eight months. It should be emphasized that the growth projection is optimistic than that of IATA and ICF. Since the COVID situation is still evolving, it would be too early to evaluate the reliability of these figures. For the time being it could be safely assumed that at least 80% of the projected figures by considering approx. 6.9% growth rate after achieving Pre-COVID level in FY2023-24 (ICF recommend 6.9 % growth rate for the FY 2017-38) would be realized given the growth potential that Hyderabad has witnessed.

It can therefore be concluded that passenger traffic of 34 million considered by GHIAL for the year 2026 for the expansion of terminal building is not likely to be achieved in FY2025-26 owing to the pandemic effect and it could be realized only by FY 2029-30.

It is noted that the traffic projections of GHIAL for the FY 2025-26 i.e. the end of third control period in the Pre-Covid scenario were 34 MPPA, which has been revised to 31.4 MPPA in Post-Covid scenario by GHIAL. As per the traffic assesment of AERA at this stage, the traffic estimation Post-Covid scenario in FY 2025- 26 is likely to be 26.85 MPPA as against Post-Covid assessment of 31.4 MPPA proposed by GHIAL. Accordingly, RITES has evaluated the Terminal facility requirements for traffic of 26.85 MPPA and 31.4 MPPA also in order to work out the CAPEX requirements upto third control period and to decide on the facilities which can be shifted to the next Control Period. The evaluation as per these requirements have been carried out in chapter 5 of this report.

4. GOVERNING PARAMETERS

4.1. REPORT OF THE INTER-MINISTERIAL GROUP (IMG) ON NORMS & STANDARDS FOR CAPACITY OF AIRPORT TERMINALS (2009)

IMG has deliberated in detail on various key issues and made following recommendations:

A Growth Rate for Traffic Projections

Keeping in view the trend in air traffic in last few years, a span of five years be adopted for the projects planned during the current five-year plan period, i.e., upto 2011-12. Thereafter, as the growth rate stabilizes, the span for making projections should be increased to 7 years for a more realistic assessment.

B Target year for Capacity Creation (Design Year)

Following norms could be adopted for capacity creation:

- Smaller airports (< 5.0 mppa) – 10th year from Planning year.

- Bigger airports (> 5.0 mppa) – 7th year from Planning year.

C Peak Hour Projections

Methodology given in ICAO Manual on Air Traffic Forecasting by finding ratios from historical data and recent studies be adopted. As per ICAO Manual, forecasts of peak period passengers are to be obtained from annual forecasts by applying ratios of busy period traffic to annual traffic derived from actual data at various airports.

Actual data for the past five years should be analyzed to determine the Peak Hour Traffic and the trend growth thereof. Projections for the Design Year should be made based on the trend growth in the past. AAI should make arrangements for data collection of Peak Hour Traffic in respect of all non-metro Airports, so that same is available at the time of planning expansion of these Airports.

Table 4.1 Traffic Ratios at International & Domestic Airports in India

SL.No	Traffic (in mppa)	Ratios for International Terminal		Ratios for Domestic Terminal	
		PD/AD	PH/AD	PD/AD	PH/AD
1	10.0 and above	1.15	0.15	1.10	0.10
2	5.0-10.0	1.2	0.20	1.15	0.15
3	1.0-5.0	1.3	0.30	1.25	0.25
4	0.50-1.0	1.35	0.35	1.35	0.35
5	Less than 0.5	1.45	0.45	1.45	0.45

D Level of Services in Target Year

Level of Services 'C' as per IATA Airport Development Reference Manual (Jan 2004) denotes good service at a reasonable cost. Therefore, this level could be used for design for target demand in the design year. The unit area specified in paragraph E below represents Level of Service 'C'. Net impact of this norm would be that in the initial years, the passengers may experience LOS 'A' or 'B' and as the traffic increases LOS 'C' would be achieved.

E Unit Area Norms

Overall space/area norm should be such as to provide a reasonable level of service for all components required in a Terminal Building. Commercial or Retail area providing amenities like food & beverages, book shops, counters for car rental, vending machines, public rest rooms etc., normally require 8-12 per cent of the overall area, and should be planned and provided accordingly. In bigger airports, i.e., with annual passenger traffic exceeding 10 million, commercial area could be upto 20 per cent of overall area. Keeping in view the IATA norms and discussion above, the norms as given in Table 4, are considered appropriate for Indian Airports.

Table 4.2 Area norms generally adopted in Indian Airports

SL.No	Nature of Terminal	Area Norm – Sqm/php
1	Domestic Terminals	
	a) Traffic upto 100 php	12
	b) Traffic between 100 -150 php	15
	c) Traffic between 150 – 1000 php	18
	d) Traffic above 1000 php	20
2	Integrated terminal for handling both domestic and international	25
3	International Terminals	27.5

F Unit Cost of Construction

IMG recommended that the Appraisal Committee should specify the ceiling unit cost and the architects/engineers of AAI should plan and implement the project within the ceiling, subject to revision on account of increase in WPI.

G Airports developed through Public Private Partnerships

In the case of airports developed through Public Private Partnerships, the project authorities may adopt a case-by-case approach with respect to norms relating to unit area and unit costs. Based on the judicious consideration of international best practices and financial viability, the norms may be specified in each case prior to inviting bids for private participation.

4.2. AERA ORDER NO. 07/2016-17

In the matter of Normative Approach to Building blocks in economic regulation of major airports – Capital Costs, AERA Vide order No. 07/2016-17 issued orders as given below:

i) Pending finalization of a norm in this regard after going through a more rigorous process, the tentative ceiling cost of Rs.65,000/- per sqm of the terminal building and Rs. 4700 per sqm for the Runway/taxiway/Apron (excluding earthwork upto sub grade level) is approved as a reasonable benchmark for evaluating capital costs to be incurred by Airport Operators of major airports for the purpose of tariff determination on a tentative basis.

ii) The airport operators are advised to relook at the costs proposed in their submissions and justify the increase, if any, over and above the ceiling rates as indicated above.

iii) The Airport operators are expected to evaluate the costs in adoption of various alternatives finishes and the corresponding benefits that accrue to users in case of adoption of such alternative higher specifications.

iv) In case the rates are higher than the ceiling rate approved by the Authority, the justifications, so submitted by the airport operators on actual incurrence of the cost shall be examined by a duly constituted Committee of experts to be constituted by Authority and based on their recommendations the final costs will be adopted.

v) These ceiling rates shall apply only in case of new projects where the works are yet to be awarded. In case of awarded projects, the capital costs will need to be examined by the committee approved for the purpose.

As per AERA order No. 07/2016-17 dt. 13.06.2016; The cost of construction at Cochin International Airport has been taken as benchmark" at Rs. 65,000/sqm for the terminal building and Rs. 4,700 per sqm for the runway/taxiway/apron (Refer Table below). This was considered for comparison by RITES Ltd. while evaluating the CAPEX proposal of GHIAL for the CP-II. Accordingly, the figures per sqm area for Terminal building and Pavements were evaluated. As the current submission by GHIAL is a combination of CP-II and CP-III, the figures worked out earlier by RITES are considered for evaluation of this CAPEX proposal.
The cost breakup of Cochin Airport as provided by AERA for the earlier study (CP- II) is as under:

Table 4.3 Cost Breakup of Cochin Airport

New International Terminal Building Salient features ,Scope, Finish and its cost break up- Cochin Airport

Sl.no	Approved Scope	Type or specification	Cost break up **INR Crore**	Remarks / Comments
1	Site Development (earth filling)	Yes		Inclusive in terminal cost
2	Terminal building 1,50,000 SQ. M	3 level (0 to +2 level)	460.99	Separate utility building of 4000 Sq.M
2A	Civil Works RCC + Steelframe	Column free check in and security hold		RCC Framed Column span 12 to 25 M
2B	False ceiling Type			
i	General Public area	Special shape and finish All area		Inclusive
ii	Toilets area	All area		Inclusive
iii	Office area	All area		Inclusive
2C	Floors Finishes -Type			
i	General Public Floors	12mm specially made vitrified Johnson		Inclusive
ii	Toilets Floors	12mm Johnson		Inclusive
iii	Office area Floors	10 mm standard Johnson		Inclusive
2D	Water supply system	Yes		Inclusive
2E	Sewerage treatment	Yes connected with existing system		0.65 MLD STB, 60 Lakhs litre UG tank Inclusive
3	Technical Features of Terminal Building		150.26	
3A	Internal electrification system	Yes		Inclusive
3B	Fire alarm & detection system	Yes		Inclusive
3C	Firefighting system, system	Yes		Inclusive
3D	Signage, Flight Information Display	Yes		Inclusive
3E	Air-conditioning and heating or Air-conditioning	3000TR		Inclusive
3F	Substation, AC Plants, other utility Building – SQ.M and part of Terminal or separate	4 DG Total 9MVA + Transformers		Inclusive
3G	Security surveillance system	Yes		Inclusive
3H	Furniture	Yes		Inclusive
3I	Trolley, Wheel Chairs	Yes		Inclusive
4	Other Equipment		142.44	
4(A)	Aerobridge (10 nos) +VGDS	TIANDA		
4(B)	Escalators (5 nos)	THYSSAN		Inclusive
4(C)	Elevators (16 nos)	THYSSAN		Inclusive
4(D)	Walkalators (total-meters in 3 sections)	THYSSAN for arrival and departure		Inclusive
4(E)	Baggage conveyors, carousal for arrival (90 M loop length, 5 nos expandable to 6 nos) and departure systems (3 island) 56 Check-in system)			Inclusive
4(G)	Other equipment – specify			
5	Airlines related interface and services		74.66	
5A	CUTE CUPPS CUSS BRS service			Inclusive

5B	Boarding Control service			Inclusive
5C	Passengers data interface with custom and immigration is part of Airlines IT or Airport CUTE			Inclusive
5D	In line screening of baggage	100%		
5E	Standalone X-ray and its screening	Provisioned		Inclusive
6	Car parking and approach road		108.58	
6A	Car park (multi-level or ground level)	Ground level	31.09	Inclusive
6B	Approach road including lighting	4 lane road	66.16	Length – 2.5 KM
6C	Railway over bridge		11.33	
7	Elevated Fly over	In front of terminal	34.57	
8	Apron and pavement –2.5 Lakhs Sq. meters	Code E + Dedicated Apron taxiway code F	165.10	
8A	Pavement Code E+F		108.39	
8B	Rubble .soil stabilization road Highmast Apron lighting and AGLlighting		56.71	
9	Other services		13.00	
10	Horticultures, Landscape	Not extensive -Minimum		Inclusive
11	Boundary (Compound) wall (operational & others)	Partly enveloped terminal		Inclusive
12	Total likely project cost	As of August 2016	1149.6	12A+12B+12D
12A	Terminal total including equipment		828.35	Total of 2,3,4&5
12B	Apron and pavement including filling		165.1	Sl.no 8
12C	Apron taxiway –only pavement		108.39	Sl.no8A
12D	Carpark, elevated Fly over and other works		156.15	Sl.no 6,7 & 9
13	Abstract cost per Sq.m			
13A	Terminal including all E&M equipment	Total Terminal floor area 150000 +utility floor area 4000= 154000 Sq.M	Rs 53789 per Sq.m	
13B	Apron and taxiway for code E +Partly for Code F		Rs 4336 per Sq.m	Excluding earth filling and soil stabilization

5. EVALUATION OF THE PROPOSAL

5.1. CAPACITY CONSTRAINTS

5.1.1. EXPANSION OF THE TERMINAL BUILDING

GHIAL has submitted its proposal on date 09/12/2020 for the expansion of terminal building with the addition of 2,48,809 sqm area for the combined 2nd and 3rd control period. However, the GHIAL vide email dated 18/02/2021 provided revised expansion area with increasing the PTB area to 2,58,089 sqm from earlier 2,48,809 sqm proposed on 09/12/2020. The area of 2,48,809sqm which was submitted by GHIAL to AERA for consideration in MYTP computation appears to be more authentic as per IGM norms as it comes within 25 sqm per Peak hour passenger for integrated terminal as generally adopted for Indian Airports as per IATA. The area of 2,58,809 sqm is exceeding the upper limit of IMG norms of 25 sqm per PHP for integrated terminal. Hence the area of 2,48,809 sqm has been considered for CAPEX evaluation.

Details of expansion of Terminal Building area by 2,48,809 sqm are explained below-

During 2nd control period, GHIAL had proposed to expand the terminal building by 1,01,175 sqm to handle around 20 million passengers per annum. Taking cognizance of the rapid increase in passenger traffic in last four years, GHIAL has proposed to expand the terminal to handle 34 million passengers per annum. The breakup details of the proposed expansion are as under:

Table 5.1 Area Breakup of proposed Terminal Building

SN	Project	Proposed Addition to Built-up Area for 20 MPPA (in sqm)	Proposed Addition to Built-up Area for 34 MPPA (in sqm)
1	Terminal Forecourt		12,095
2	Terminal Expansion: Eastside West-side	 14,806 35,350	 27,914 69,703
3	Pier Expansion: Eastside West-side	 34,507 16512	 69,020 70,077
	Total	1,01,175	2,48,809

The existing terminal building was built in the year 2008 and is spread over an area of 1,17,339 sqm. The building has been designed to cater 3200 PHP and to handle 12 million passengers per annum. The passenger traffic at Hyderabad International Airport surpassed 12 Million mark in 2016 and grew substantially in the following years to reach more than 21 million in 2019. GHIAL,

as part of short to medium term measures to match the growing demand and decongest the terminal is operating already past its design capacity.

The additional area now proposed is 2,48,809 sqm to handle additional 22 million passengers per annum.

While evaluating the proposal, the following have been taken into consideration:

1. The existing terminal building was commissioned in 2008 before issue of guidelines on area norms by the Inter-Ministerial Group and therefore the area norms of 25 sqm/passenger for the integrated terminal suggested by IMG was not applicable during the initial period of commissioning. However, while evaluating the current proposal, the applicable IMG norms have been considered.
2. The passenger terminal building is a seven level building, two levels for arrival process, two for departures and three levels for baggage makeup/sorting and backup offices/services. The PTB has handled approximately 21 MPPA traffic last year (2020).

   The pier expansion is guided by the area requirement of departure lounge for International and Domestic passengers and the gate requirements.

   The operations in terminal area are constrained, particularly during consecutive peaks in domestic process at morning & evening hours and at international peaks observed late night/early mornings. These peaks are unlikely to disperse given the high volume of Origin-destination traffic that constitute bulk of the traffic demand. This is also dependent on the peak hour slot availability at the destination and sources, which in this case are mainly metro cities resulting in aggravation during early morning hours when domestic & international peaks overlap.

   Also, it was pointed out in the previous report that the domestic & international piers/hold areas are segregated in the existing PTB, thereby reducing utilization for domestic traffic during non-peak hours on the international side. This has been mitigated by using the swing gates. The proposal provides for 4 swing gates to switch the operations between Domestic and International as needed.

   The expansion possibilities to the passenger terminal building at Hyderabad airport can be along the sides i.e., parallel to runway as the building depth is restricted by apron on one side and departure/arrival ramps on the other side. Therefore, the proposed expansion has been planned in the areas where expansion is possible.

3. The proposed expansion as shown in the plan below reflects that expansion is planned at 5 distinct locations i.e. East & West sides of PTB , the Forecourt and East & West Piers. Area of proposed expansion at these locations is given in above Table No. 5.1.

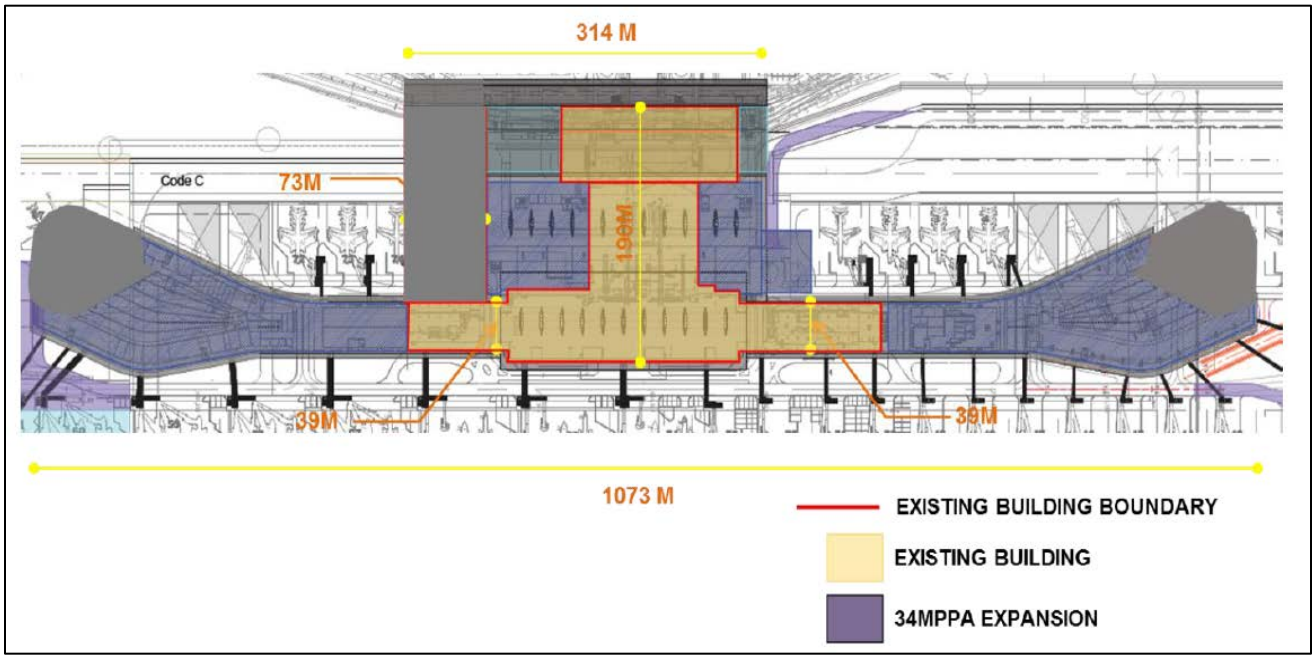

Figure 5-1 Proposed Passenger Terminal Building Expansion

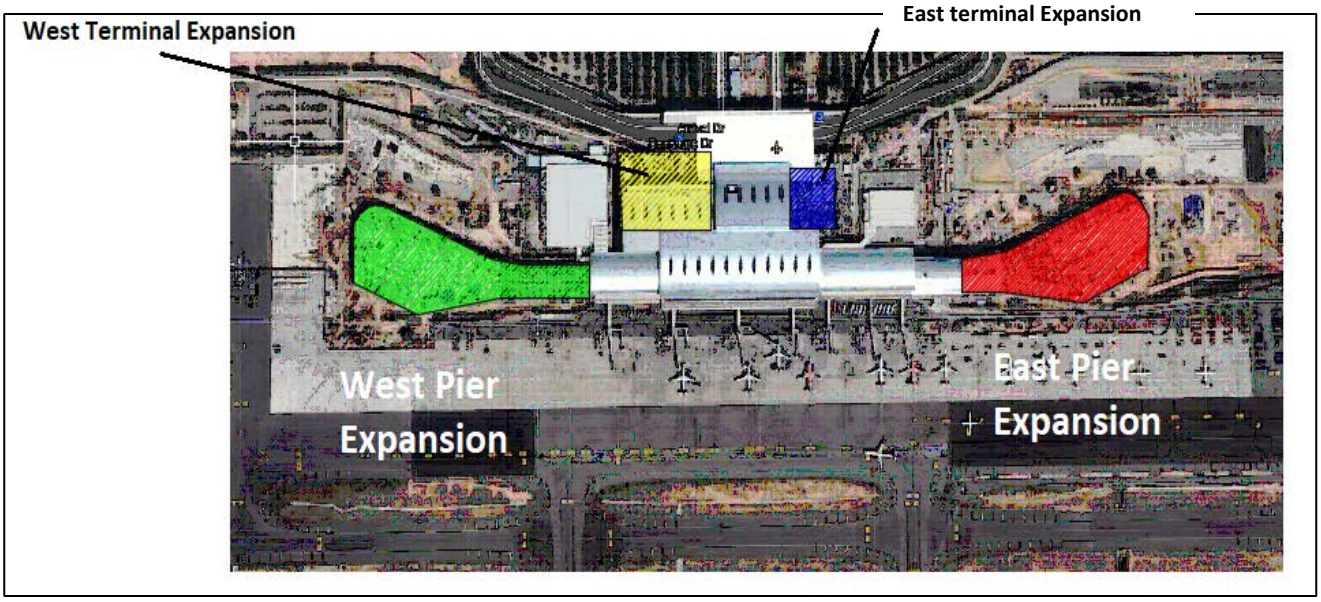

Figure 5-2 Google image of Proposed Passenger Terminal Building Expansion

The google image of the Terminal Building shown at above figure no. 5.2 reflects that the expansion /construction activity at all the above proposed locations is in progress. Hence, reduction in the area of expansion at this stage is an unviable option.

5.1.2. CAPACITY CALCULATION OF PASSENGER TERMINAL BUILDING

Proposed Expansion to Passenger Terminal Building

The existing terminal building was designed to handle 12 million passengers annually or 6400 passengers (combined) during peak hours. In the previous proposal, GHIAL has proposed to expand the terminal building to cater to domestic peak hour pax of 4958 and international peak of 4033 corresponding to 20 million pax.

As per the peak hour pax (PHP) **projections of GHIAL**, the PHP during FY 18 should have reached 7666 (combined) and the same is expected to be around 11511 by FY 21 and 14691 by FY 24.

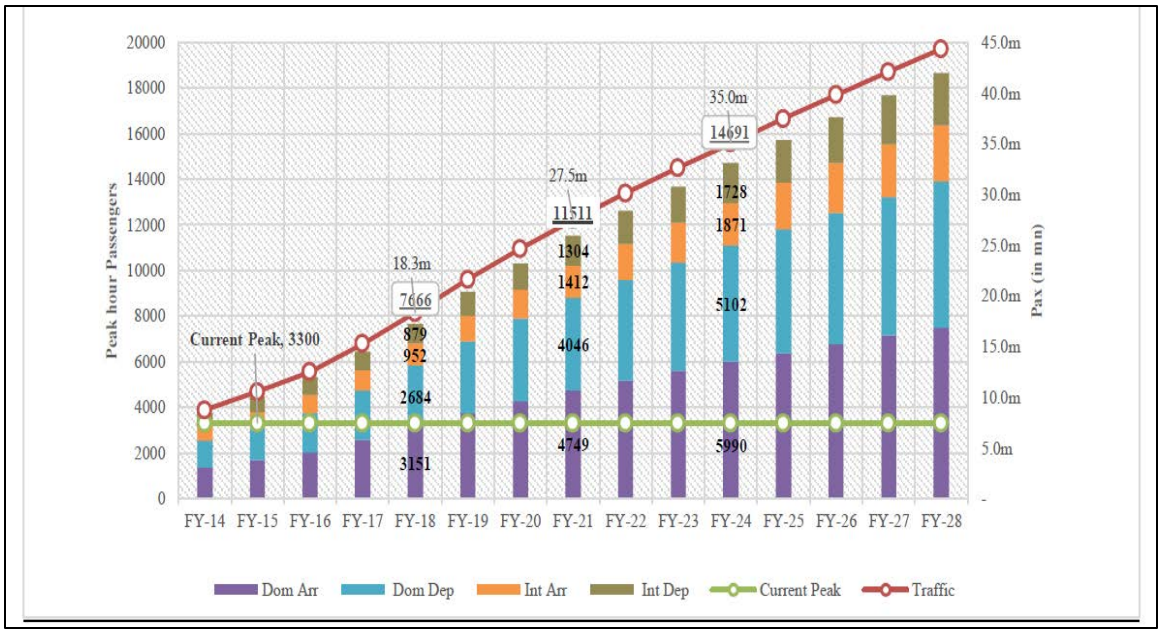

Figure 5-3 Peak Hour Passengers (PHP) forecasted by GHIAL

The breakup of the projected PHP (As per above PHP projection graph of GHIAL) is tabulated below:

Table 5.2 Peak Hour Passenger Details for three different years given by GHIAL

PHP	FY 2018	FY 2021	FY 2024
Domestic Arrival	3151	4749	5990
Domestic Departure	2684	4046	5102
International Arrival	952	1412	1871
International Departures	879	1304	1728
Total	**7666**	**11511**	**14691**

It is worth mentioning that the PHP as reported for FY18 has crossed 6609 as against the projections above. While the figure for the FY 2021 is unlikely to be realized given the widespread pandemic and travel restrictions it is expected that as conditions improve, the traffic growth will pick up pace and projected PHP corresponding to traffic of 34-35 Million pax will be realized but with delay of two to three years past FY 2026.

Terminal Area per PHP

Area proposed by GHIAL Per PHP = Total Built-up Area / Total Peak Hour Passenger

- Existing Building Built up Area = 1,17,339 Sqm
- Proposed expansion of PTB in CP 2 + CP 3 = 2,48,809 sqm
- Total proposed Built-up Area After expansion = 3,66,148 sqm
- Area per Peak Hour Passenger (PHP) = 3,66,148 Sqm / 14691 = 24.92 Sqm.

As per Inter-Ministerial Group (IMG) & IATA norms an area of 25 sqm/PHP is considered appropriate for Indian Airports for Integrated terminal.

It has been evaluated and found that the proposed Total Built-up Area/PHP of 3,66,148 sqm is meeting the requirements of Inter-Ministerial Group (IMG) & IATA norms.

Since the international traffic is very low as compared to domestic traffic and if we do separate analysis for domestic and international traffic as per IGM norms the following is observed:

- As per IMG norms for Indian airports, for domestic traffic, the area of 20sqm/PHP is considered appropriate. Therefore, the total area required for expansion for domestic passenger is 20*(5990+5102) = 221840 sqm
- Similarly, the international traffic the area of 27.5 sqm/PHP is considered appropriate. Therefore, the total area required for expansion for international passenger is 27.5*(1871+1728) = 98972.5sqm
- Total area required for PTB is 221840 + 98972 = 3,20,812 sqm

Hence, Terminal expansion requirement for combined CP -2 & 3, if calculated individually for Domestic and International PHP, works out to 320812 - 117339 = 203473 sqm as against 248809 sqm proposed by GHIAL. Though the total expansion requirement calculated individually for domestic and international passenger works out to less than the expansion proposal of GHIAL, however, as the terminal is integrated for International and domestic passengers, the proposal of GHIAL for expansion of PTB by 2,48,809 sqm is found to be justified for 34 MPPA as it meets the IMG norms of 25 sqm/PHP for an Integrated Terminal.

Table 5.3 Comparison of Terminal Building Area requirement for proposed traffic by year 2025-26 with different traffic scenarios

By considering 25sqm per PHP				
S No.	**Description**	**GMR Precovid forecast (34MPPA)**	**GMR Post Covid Forecast (31.4MPPA)**	**AERA Postcovid Forecast (26.85 MPPA)**
a)	Passenger (MPPA)	34	31.4	26.85
b)	Peak Hour Pax. (By straight line interpolation of PHP provided by GHIAL for 34MPPA and 18.3MPPA)	14691	13527*	11491*
c)	Total Area of Terminal Building by considering 25 sqm per PHP (b X 25)	367275	338175	287275
d)	Existing Area (sqm)	117339	117339	117339
e)	Additional Area required (sqm) for combined 2nd and 3rd control period by considering 25 sqm/PHP (c – d)	249936	220836	169936
f)	Total Area proposed by GHIAL in 3rd Control Period (sqm)	248809	-	-
g)	Area already proposed in 2nd control period (sqm)	101175	101175	101175
h)	Area proposed for 3rd control period only (sqm) (f – g) & (e-g)	147634	119661	68761

Note:

1) **PHP for 31.4 MPPA and 26.85 MPPA have been calculated in proportion to the annual traffic.**
2) **The Terminal Building area expansion of 2,48,809 sqm proposed by GHIAL is found to be in order in accordance with IMG/IATA norms for the traffic projections of 34 MPPA.**
3) **The Terminal Building area expansion requirements commensurate to the traffic projections of 31.4 MPPA and 26.85 MPPA comes to 2,20,836 sqm & 1,69,936 sqm respectively.**

CONTACT GATE DEMAND

The current number of gates available (12 contact gates in Code C Configuration) are not adequate to cater to the present-day traffic which has already crossed the 21 Million mark.

As per IATA, the required number of gates at an airport can be determined using the following equation:

$$n = \frac{vt}{u}$$

Where:
n = number of gates required, v = design hour flow for departures or arrivals (aircraft / hour)
t = mean stand occupancy (hour) – nearly 1.0 hour.
u = utilization factor 0.6 – 0.8

n = 26 x 1.0 /0.6 = 43.3 say 44 contact gates.

Gate Demand Based on Enplaned Passenger per gate approach and Departures per gate approach.

The following gate demand has been worked out based on recommendations of IATA and TRB.

It was assumed that most of the international traffic (approx. 90%) and 70% of the domestic traffic would be enplaned through contact gates and the domestic traffic is expected to rise to 85% by the design year. The Number of Contact gates required as worked out using Enplaned passengers per gate and the same is tabulated below.

Table 5.4 Number of Contact gates required using Enplaned passengers per gate

Enplaned Passengers per Gate Approach					
Year	**Annual Enplaned Passengers**	**Annual Departures**	**No of gates**	**Enplaned Passenger per Gate**	**Enplaned Passenger Per Dept.**
2013	35,20,494	33,089	12	2,93,400	106
2014	36,49,905	32,391	12	3,04,200	113
2015	44,02,084	34,756	12	3,66,800	127
2023	101,86,538	90,231	31	3,26,900	113
2024	114,81,942	1,01,059	35	3,29,000	114
2025	125,36,759	1,09,585	38	3,31,300	114
2026	133,55,494	1,16,152	**40**	3,33,000	115

Similarly, the number of gates required were worked out using the Departures per gate approach. The number of gates as calculated based on departure per gates is tabulated below.

Table 5.5 Number of Contact gates required using departure per gate

Departures per Gate Approach					
Year	**Annual Enplaned Passengers**	**Annual Departures**	**No of gates**	**Annual Dept. Per gate**	**Daily Dept. per gate**
2013	35,20,494	33,089	12	2,760	7.6
2014	36,49,905	32,391	12	2,700	7.4
2015	44,02,084	34,756	12	2,900	7.9
2023	101,86,538	90,231	**35**	2,560	7.0
2024	114,81,942	1,01,059	**38**	2,630	7.2
2025	125,36,759	1,09,585	**39**	2,780	7.6
2026	133,55,494	1,16,152	**40**	2,930	8.0

It could be seen that the number of contact gates required works out to 40 from either of the two methods. It has been assumed that the daily departures per gate would go down as the new gates are commissioned and as the traffic will grow the departures per gate will reach the similar levels as prevailing during 2015 keeping in mind that international passengers and majority of domestic passengers will be moved through contact gates by the design year.

Thus, the total demand of contact gates for the demand year works out to be **40 for 34 MPPA.**

In the previous report (CP 2) of RITES, it was brought out that at-least 22 gates would be required for catering to the design traffic of 20 MPPA.

Taking straight line interpolation between the passenger and number of contact gates, the linear equation is derived and accordingly contact gates required for 31.4 MPPA and 26.85 MPPA are worked out as approximately 37 & 31 respectively. However, as the works have been awarded by GHIAL and the construction is ongoing, it is not feasible to reduce the number of gates at this stage.

5.1.3. EXPANSION OF THE KERB AND APPROACH RAMP

The current proposal, projects the total 3587 vehicles in departure and 2899 in the arrivals during the peak hour for 34 Million annual pax. To cater to projected demand the ramp capacity needs to be further increased from the existing 220 m length. The current proposal entails increasing the length of ramp to 300 m to correspond to the expanded terminal building. The expansion of kerb and Approach ramp was proposed for second control period for increasing the kerb by adding lanes to both arrival and departure ramp. It was brought out in the previous RITES report that the kerb length required to cater for 2000 vehicles in departure and 1100 vehicles in arrival would require doubling the effective kerb length by addition of parallel lanes. The increase in length of the arrival and departure ramp is justified. The contract for the subject work was already awarded in August 2017.

FORECOURT EXPANSION

The Departure forecourt area at Hyderabad Airport is utilized mainly for horizontal circulation, retail facilities and common use self service area (CUSS). The departing passengers moving from the ramp to the terminal, crosses the forecourt through two bridges. It has been reported that the forecourt can cater up to 2741 peak hour pax. The design year projection of departures is 6830 pax (combined) and the arrival peak (combined) is 7861 pax. The current entry points at the departure forecourt are three. For an average processing time of 10 sec at entry gate per pax the number of entry lanes required works out to 23. The projected entry gate demand for the design year is 8 number with 23 entry lanes in total which is justified.

Table 5.6 Number of entry lanes required in Forecourt Area

Entry Gates to Terminal			
Peak-hour departing passengers	a	PHP	6,830
Average processing time	b	sec/pax	10
No. of pax throughput per lane per hour	c	pax / lane	360
Efficiency factor	d	%	85%
Entry lanes required including efficiency factor	a/(c*d)	lanes	23

5.1.4. PIER EXPANSION

The pier expansion is worked out based on the TRB Models keeping in mind that the expansion if required had to be done in modular templates as the Ultimate Master plan. The calculations for area required are tabulated below.

Table 5.7 Pier Area calculation of Terminal Building

PIER AREA CALCULATION	
No. of Seats on Design Aircraft	196
Load Factor	95%
No. of Design Passengers	186
Percent Seated	80%
Percent Standing	20%
Seated Passenger Space Requirement (sqm)	1.7
Standing Passenger Space Requirement (sqm)	1.2
Seated & Standing area (sqm)	298
High Utilization Factor (Increase)	20%
Holdroom Sharing Factor (Decrease)	5%
Adjusted Seated and Standing Area (sqm)	**343**
Podium Width/Position (m)	2
Depth of Podium to back wall (m)	3
Podium Queue Depth (m)	10
Area per Podium Position (sqm)	26
Number of Podium Positions	1
Total Podium and Queue Area (sqm)	**26**
Boarding/ Egress Corridor Width (m)	3
Depth of Hold room (m)	25
Boarding/ Egress Corridor per Bridge / Door (sqm)	75
Number of Bridges/ Doors	2
Boarding Corridor Area (sqm)	**150**
Total Hold area	**519**
Width for Circulation including space for travelators	15
Length Circulation area	30
Circulation area sqm	**450**
Area for Amenities (50% of hold area)	**260**
Commercial Area (max 20% of Hold room area)	**104**
Total Hold room Area (sqm) per gate	**1333**
Total Area of Concourse (sqm) for 33 gates at level F	**43989**

Total area proposed for east side and west side pier for Level F (Departure concourse for Contact gates is 46710 sqm (23,350 sqm east pier + 23,360 sqm in west pier). This is in line with the calculations above.

Therefore, the expansion on East-side pier and west side pier to accommodate 33 contact stands is justified for 34 MPPA.

5.1.5. AIRSIDE EXPANSION

GHIAL has submitted its proposal on date 09/12/2020 for the expansion of Apron and Taxiways with the addition of 2,37,565 sqm and 4,64,631sqm area (Combined Airside area 7,02,196 sqm) for the combined 2nd and 3rd control period. However, vide email dated 18/02/2021 they have changed the expansion of Airside area with addition of 209073 sqm for Apron and 541776 sqm for Taxiways (Combined Airside Area 7,50,849sqm). The area of 7,02,196 sqm which was submitted by GHIAL to AERA for consideration in MYTP computation has been taken for evaluation of CAPEX.

The airport at present has 42 stands of which 12 are contact stands (6 + 3x2). During the previous proposal, GHIAL has proposed to increase the Apron stands to 52. In the current proposal, GHIAL has proposed to increase the total number of stands to 101. The details of the stands are tabulated below.

Table 5.8 Details of Contact and Remote gates after expansion

Sr No.	Description	Number of Stands
1	Existing Contact stands	12
	New Contact stands (international) New Contact stands (domestic)	16 17
	Total Contact stands post Expansion	**45** (includes 4 swing stands)
2	Existing Remote Stands	30 (some to be reconfigured for contact stands)
	New Remote Stands	52
	Total number of Remote stands (post expansion)	**56**
3	**Total Stand (contact + Remote)**	**101**

As per ICAO guidelines, the required number of aircraft stands at passenger terminal may be estimated by the following formula:

$S = \sum (Ti/60 \times Ni) + \alpha$ where S = required number of aircraft stands

Ti = gate occupancy time in minutes of aircraft group i

N i = Number of arriving aircraft group i during peak hour

α = number of extra aircraft stands as spare

Considering total peak hour ATM of 51 in the design year with total peak hour arrival of 20 domestic and 5 international aircraft and a turnaround time of 60 minutes for domestic flight and 120 minutes for international flight the approximate aircraft stand requirement for the design year works out as under:

Number of domestic aircraft stand

S = 60/60 x 20 + 1 = 21 stands

Number of international aircraft stand

S = 120/60 x 5 + 1 = 11 stands

The international stands calculated corresponds to larger aircrafts in code E and F, these stands can serve two code C aircraft. In addition, the night parking requirement as projected is in excess of 84 for the design year as projected by GHIAL based on request by various airlines. The demand projection as per GHIAL is reproduced below.

Figure: Stand Requirement Forecast

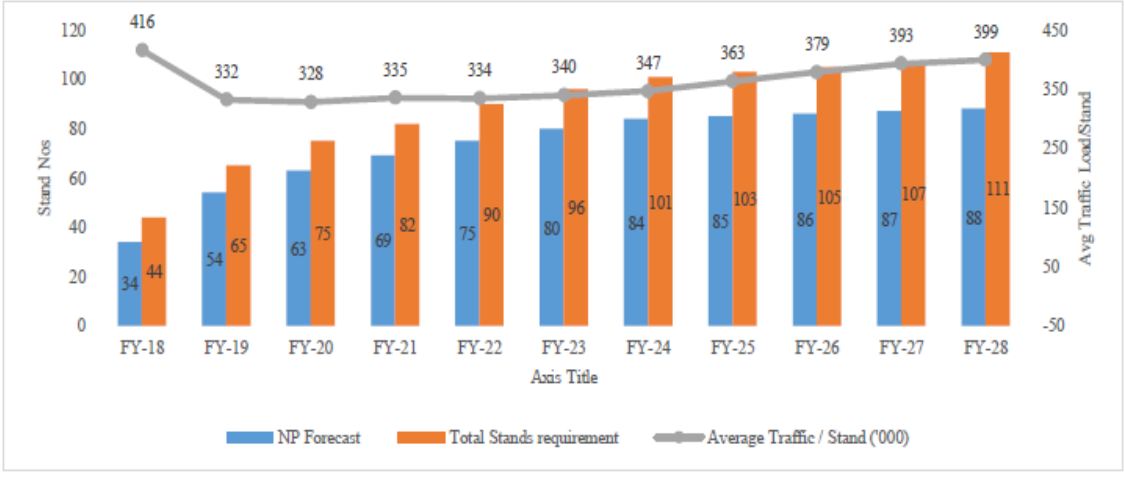

Figure 5-4 Stand requirement forecast by GHIAL

However, in the view of projected reduced traffic of 26.85 MPPA and 31.4 MPPA, the requirement of contact stand can be reduced but the night parking requirement as forecasted by GHIAL is 93 in the design year 2024 which implies that the overall parking requirement is more than the proposed 101 (contact + Remote). Thus, the demand for total aircraft stand requirement of 101 projected by GHIAL is considered reasonable as some of the contact gates will also be utilized for night parking.

Area Requirement for Apron and Taxiways

The approximate area required for remote stands for Code 'C' type of aircraft is 3700 sqm per aircraft. Thus, the total area of additional stands for North East Remote Apron works to 1,55,400 sqm for 40 code C parking stand and 4 code B parking stands. The rest of remote stands are being developed around the proposed terminal building while some of the existing remote stands will be converted to contact stands.

The airside expansion entails extension of taxiway Bravo on east and west side by nearly 2350 m (combined) with shoulder on each side. The total area for taxiway extension is 1,01,050 sqm. The extension of taxiway bravo will facilitate movement of aircrafts in both directions allowing effective utilization of Runway system. The existing taxiway Alpha is being used as secondary runway while the main runway is under maintenance, extension of the taxi Bravo will reduce the excess load during the maintenance period of main runway.

The rapid exit taxiways (RETs) at chainage 1250m and 1800 m are proposed to reduce the runway occupancy time. The peak hour capacity of runway as projected for the design year is 51 ATM during the peak hours. The design capacity is not likely to be achieved with the existing taxiway system. Further, to achieve the 51 ATMs during the peak hour the inter arrival separation distance has to be reduced to 5-6 Nm. Currently the airport is operating with the declared separation of 8 Nm. The area breakup for the airside development is tabulated below.

Table 5.9 Details of proposed Airside area expansion

Sr No.	Description	Area	Remarks
1	Apron Expansion	2,37,565 sqm	Includes expansion of Remote Apron and Expansion of Apron around terminal Building.
2	Taxiway Expansion	4,64,631 sqm	Includes extension of Taxiway Bravo on East and west side, Crossfield taxiways Taxi M and Taxi K, taxi for remote apron, and RETs.

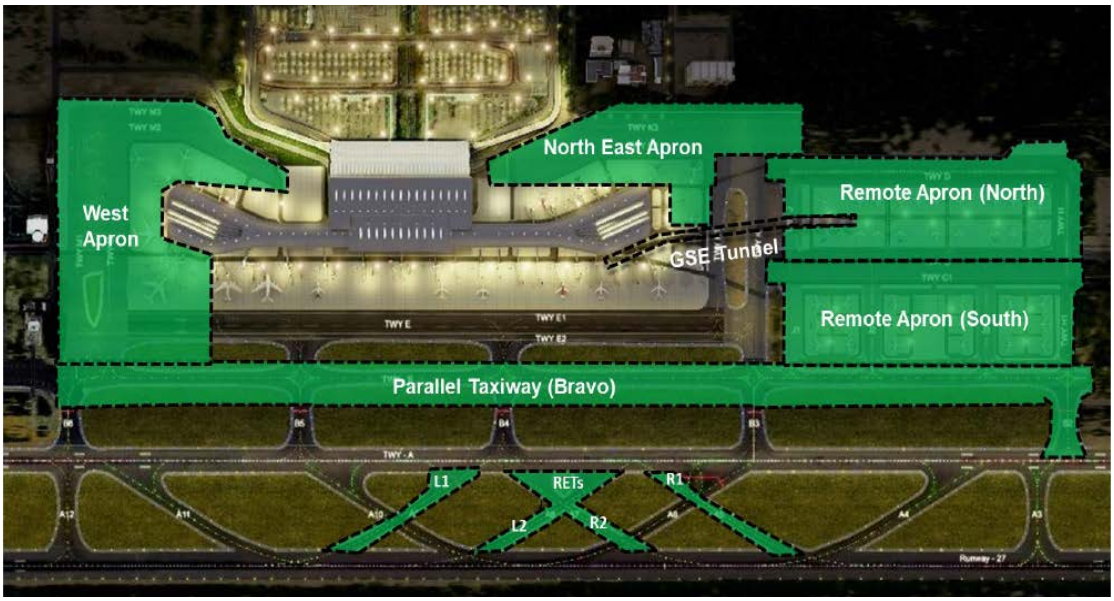

Figure 5-5 Proposed expansion of apron and taxiway system

5.1.6. MAIN ACCESS ROAD

The Existing Main Access Road is a 4-lane dedicated access road from NH-7 coming from the west & from Srisailam Highway (NH-765) coming from the east with an interphase of 4 rotary junction which regulate the cross movement across the same, on to airport & associated existing facilities.

Main access road caters to both Airport & Non-airport Traffic like that of SEZ, hotel, other commercial establishment etc.

As per project information file capacities of roads is given below:

Table 5.10 Traffic Capacity of Existing Approach and Exit Road

Elements	Feature	Current Capacity, PCU/hr.	Requirement 2014-15, Peak Traffic (PCU/Hr.)
Approach Road	2lane	2400*	1933
Exit Road	2lane	2400*	2027
* Source - Highway Standards: Urban Roads capacity			

As per PIF report, the total Airport road traffic the arriving / departing traffic are split across two main entrances. The broad split traffic across two entrances (excluding two wheelers) are as listed below:

- West entrance (NH - 7): 70%
- East entrance (NH-765): 30%

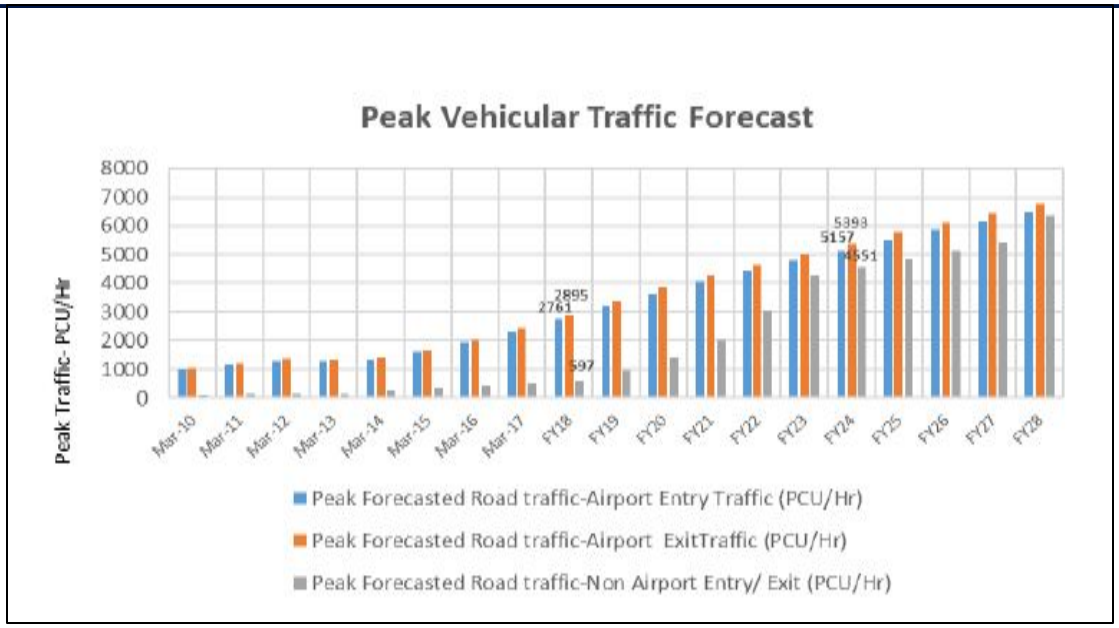

Figure 5-6 Peak Vehicular Traffic Forecast of Main Access Road

In the peak vehicular traffic forecasted graph, when the Airport will approach to the 34 MPPA it can be seen that Peak Airport entry traffic, exit traffic and Non-Airport entry /exit traffic will be 5157 PCU/Hr., 5393 PCU/Hr. & 4551 PCU/Hr. respectively.

As per the above data, the maximum traffic PCU per hour in west direction will be

= 0.7 X 5393 + .5 X .7 X 4551

= 5367.95 PCU per hour in flow direction from west

With the combined Airport traffic and Non-airport development picking up at airport will see the overall peak in single directional demand exceeding would 5000 PCU/Hr/Flow Direction mainly from western side.

As per information given in PIF, the metro project materializing in next 3-4 years, might cater to about 20% of the traffic demand and the effective road peak traffic will be always in excess of 4000PCU/Hr/ Flow direction from west as passenger approach to 34MPPA airport capacity.

As per the IRC 86 1983 and the above data given, the proposed 8 Lane Main Access Road is justified from NH-7 to Departure Junction against 34MPPA Pax.

As per three different traffic scenarios, the vehicular traffic for the passenger is also evaluated in following three options –

Table 5.11 Traffic in PCU per hour calculations for different traffic scenarios

S No.	Description of Passenger (MPPA)	Airport Entry Traffic (PCU /Hr)	Airport Exit Traffic (PCU /Hr)	Non Airport Entry/Exit Traffic (PCU /Hr)
a)	Traffic available against 18.15MPPA	2761	2895	597
b)	Traffic available against 34MPPA	5157	5393	4551
c)	**Equation of Line calculated by linearly interpolation of available data against 18.15 MPPA and 34MPPA**	Y=151.17X+3.62	Y=157.60X+34.6	Y=249.46X-3930.64
d)	GMR Pre covid forecast (34MPPA)	5157.00	5393.00	4551.00
e)	GMR Post Covid Forecast (31.4MPPA)	4750.36	4983.24	3902.40
f)	AERA Post Covid Forecast (26.85 MPPA)	4062.53	4266.16	2767.36
g)	**As per GHIAL, 70% traffic is coming from west direction. We have considered maximum Airport (Exit direction) traffic for evaluation.**			
h)	GMR Pre covid forecast (34MPPA) (d X 0.7)		3775.10	1592.85
i)	GMR Post Covid Forecast (31.4MPPA) (e X 0.7)		3488.27	1365.84
j)	AERA Post Covid Forecast (26.85 MPPA) (f X 0.7)		2986.31	968.58
k)	**As per GHIAL 20% traffic demand will be met by Metro**			
l)	GMR Pre covid forecast (34MPPA) (h X 0.8)		3020.08	1274.28
m)	GMR Post Covid Forecast (31.4MPPA) (i X 0.8)		2790.61	1092.67
n)	AERA Post Covid Forecast (26.85 MPPA) (j X 0.8)		2389.04	774.86
o)	**Total traffic forecast**			
p)	GMR Pre covid forecast (34MPPA) (l)		**4294**	
q)	GMR Post Covid Forecast (31.4MPPA) (m)		**3883**	
r)	AERA Post Covid Forecast (26.85 MPPA) (n)		**3164**	

The maximum capacity as per IRC 86 - 1983 can be seen as per below table:

As per IRC 86 - 1983

TABLE 4. TENTATIVE CAPACITIES OF URBAN ROADS BETWEEN INTERSECTIONS

No. of traffic lanes and widths	Traffic flow	Capacity in PCUs per hour for various traffic conditions		
		Roads with no frontage access, no standing vehicles, very little cross traffic	Roads with frontage access but no standing vehicle and high capacity intersections	Roads with free frontage access, parked vehicles and heavy cross traffic
2-lane (7-7.5m)	One way	2400	1500	1200
	Two way	1500	1200	750
3-lane (10.5m)	One way	3600	2500	2000
4-lane (14 m.)	One way	4800	3000	2400
	Two way	4000	2500	2000
6-lane (21 m)	One way*	3600	2500	2200
	Two way	6000	4200	3600

*For three lanes in predominant direction of flow.

Figure 5-7 Tentative Capacities of Urban Roads between intersections

As per the above table of IRC code, the lane requirement is given below against the forecasted traffic:

Table 5.12 Number of lanes requirement for different traffic scenarios

Description	GMR Precovid Forecast (34MPPA)	GMR Post Covid Forecast (31.4MPPA)	AERA Post Covid Forecast (26.85 MPPA)
Maximum PCU/Hr taken from above table	**4294**	**3883**	**3164**
No. of lanes one way	**4 lane**	**4 lane**	**3 lane**
Total lanes both side	**8 lane**	**8 lane**	**6 lane**

As per the above three scenarios, AERA may decide the selection of any options from above table considering the current scenario and traffic assesment appropriately.

5.2. THE CAPITAL COST PROPOSAL

5.2.1. GENERAL

The capital cost proposal has been submitted by GHIAL by adopting the following methodology:

- GHIAL has submitted combined proposal for both 2nd & 3rd control (2016 -21 & 2021 to 26) period expansion to AERA for cumulative capital cost Rs. 5596.23 Cr.
- GHIAL also stated that the award of 2nd control period work was delayed by one year and implementation of the same will also delayed by one more year i.e. up to 2023.
- Detailed cost is proposed by GHIAL by sub head wise summation of Purchase order (PO's) issued to different agencies for the said work. Balance works for which work order (PO) is not yet issued are provisionally estimated on lump sum basis. No rate analysis to justify the reasonableness has been submitted and it is mentioned by GHIAL that rates/price is based on historical data from GMR and other Airports under PPP.
- For the purpose of justification of cost for combined 2nd & 3rd control period, GHIAL has considered their rate per unit area for Terminal Building & Airside Area enhanced by addition of GST (6%) & inflation (6% per annum) for two years over the approved unit rates by AERA for the second control period instead of detailed estimate.
- GHIAL has bifurcated its estimate in two parts out of which one part is Terminal Building including Civil works, E&M works and the other part is Airside works which includes the Taxiways, Apron , AGL , Drains and Apron works etc.
- In the 2nd control period, provision of GSE tunnel and city side Approach road was not proposed, however the same has been considered in this combined proposal. For this, GHIAL has submitted a summary of PO's of Rs. 82.80 Cr for the GSE tunnel and one PO of Rs. 24.23 Cr. and lump sum estimate of Rs. 142.77 Cr. for the Road works.
- Lump sum details of Preliminaries, permits &Insurance, design, PMC, and contingencies is also given.
- Initially GHIAL has submitted the issued PO's to different agencies for more than 90% of the works, whose details given below.

Table 5.13 Details cost breakup of Capital Expenditure received from GHIAL

GHIAL-Project Expansion Cost Summary — Rs Crs

SN	Particulars	Revised Budget submitted to AERA	Awarded Contract (B)							Balance to be awarded
			L&T	MW	MVR	VNC	Beumer India	Others	Total Pos issued	
		A							B	C=A-B
1	Expansion of the Terminal Building	2,658.32	2343.44					72.20	2,415.65	242.67
2	Airport Systems	1,070.00		875.04			138.32	15.67	1,029.03	40.97
3	Expansion of the Kerb & Approach Ramp	156.40				146.77		0.98	147.75	8.65
4	Expansion of Apron & Taxiways	895.66	637.73		142.70	58.98		18.11	857.53	38.13
5	Road Infrastructure	167.00				24.23			24.23	142.77
6	GSE Tunnel	82.80	82.80						82.80	(0.00)
	Sub- Total	5,030.18	3,063.98	875.04	142.70	229.99	138.32	106.96	4,556.99	473.19
7	Preliminaries, Insurance & Permits	120.10						26.51	26.51	93.59
8	Design Development & PMC	202.94						193.51	193.51	9.43
9	Contingencies	243.01						-	-	243.01
	Total	5,596.23	3,063.98	875.04	142.70	229.99	138.32	326.98	4,777.01	819.22

RITES remarks on the methodology adopted by GHIAL to justify the CAPEX:

- As per the AERA normative approach order No. 07/2016-17 issued on dated 13/06/2016, The Airport operator is expected to determine cost as per publicly available standard like CPWD norms for scheduled items and market rate analysis for non-schedule items. **This is not followed by the GHIAL in this combined 2nd and 3rd expansion proposal.**
- Through the above issued PO's and the lump sum estimates, it is not possible to work out the exact contents and extent of work.
- In view of above, RITES has evaluated the CAPEX of 2nd & 3rd control period based on the already evaluated 2nd control period CAPEX (2016-21) and duly enhanced it by GST & Price variation.

5.2.2. EXPANSION OF TERMINAL BUILDING – COST EVALUATION

AS PROPOSED BY GHIAL

The GHIAL has estimated the CAPEX based on cost per unit area of approved rate instead of detailed calculation-

For the terminal Building, GHIAL has considered the previously worked out basic rate of Rs. 1,22,466/- per sqm as hard cost with addition of 6% per annum inflation for the delay in award & implementation of work and also added 6% for the GST component as old rates were of Pre-GST regime.

The basic rate is inclusive of the Civil works & finishes, Airport system, E&M work, IT system etc. The detailed calculations of estimated of unit cost as per GHIAL is as under:

Basic Rate per sqm of Building = 1,22,466

Add 6% inflation for the first year = 1,22,466 x 0.06 = 7347.96

Add 6% inflation for the 2nd year = (1,22,466 +7347.96) x 0.06 = 7788.83

Add 6% GST = (1,22,466 +7347.76+ 7788.83) x 0.06 = 8256.15

Total cost per unit area = Rs. 1,45,858.94

Total cost of Passenger Terminal Building for 2,58,809 sqm area

= 2,58,089 X 1,45,858.94

= Rs. 3,764.45 Crores

GHIAL has stated that they have calculated the estimates for expansion of PTB as per above procedure and submitted their budget estimate of Rs. 3728.32 Crores (PTB + Airport system- As per table in para 5.2.1 above) to AERA which includes Civil works & finishes, Airport system, E&M work, IT system etc.

AS REVIEWED BY RITES

The cost of Terminal Building has been reviewed/scrutinized in the same way as GHIAL has calculated and is summarized below. However, the Terminal area considered for evaluation by RITES is 2,48,809 sqm (Submitted by GHIAL to AERA for MYTP computation) which is as per IMG norms as against area of 2,58,809 sqm considered by GHIAL while justifying its CAPEX.

RITES has calculated the inflation based on the indices issued by Construction industry development council (CIDC indices) on monthly basis for the construction industries. In this calculation RITES has calculated the CAGR = 3.02% per annum.

RITES have considered period of 02 years for inflation/ escalation as proposed by GHIAL due to delay in the award of work by one year and delay in its implementation by one more year. The combined period of construction for the 2nd& 3rd control period is 2018 to 2023.

It has been seen that the cost considered in the 2nd control period was valid upto the year of 2021 which implies that the inflation/ escalation will be applicable over the area proposed in third control period only beyond the year 2021 and upto year 2023 (for 2 years).

As proposed by GHIAL, the GST is considered @ 6 % per annum.

The total cost is calculated as under:

Basic Cost per unit sqm = 1,22,466/-

Add Inflation for one year @ 3.02% = 1,22,466 X .0302 = 3698.47/-

Add inflation for 2nd year @ 3.02% = (1,22,466+3,698.47) X .0302 = 3810.17

Add GST @ 6% = (1,22,466+3,698.47+3810.17) X .06 = 7,798.48

Total cost per sqm = Rs. 1,37,773.12

Basic cost per sqm including GST only = 1,22,466*1.06 = 1,29,813.96

Cost of the Terminal Building for the area of 2nd Control Period = 1,01175(sqm)X Rs. 129813.96

Cost of the Terminal Building for the area of 3rd Control Period = 147634(sqm) X Rs. 137773.12

= **Rs. 3,347.39 Crores**

As the award of work and implementation is delayed by 02 years, as advised by AERA, RITES has calculated cost for both the cases by considering inflation and without inflation. The case discussed above was after considering the effect of inflation and the case discussed below for without inflation

Basic Cost per unit sqm = Rs. 1,22,466/-

Add GST @ 6% = Rs. 1,22,466 X .06 = 7347.96

The cost per sqm = Rs. 1,29,813.96

Cost of the PTB for the area of 2nd & 3rd Control Period = 2,48,809(sqm) X Rs. 1,29,813.96

= **3,229.89 Crore**s

Based on the above observations, the cost of the terminal building for 34 MPPA expansion has been worked out for the two cases by considering the inflation and without inflation of Rs. 3,347.39 Crores and 3229.89 Crores respectively against Rs. 3,728.32 as Crores estimated by GHIAL.

Table 5.14 Cost Evaluation of Terminal Building Expansion for different traffic scenarios

	By considering 25sqm per PHP			
S. No.	**Description**	**GMR Pre Covid forecast (34MPPA)**	**GMR Post Covid Forecast (31.4MPPA)**	**AERA Post Covid Forecast (26.85 MPPA)**
a)	Passenger (MPPA)	34-35	31.4	26.85
b)	Peak Hour Pax. (By straight line interpolation of PHP provided by GHIAL for 34MPPA and 18.3MPPA	14,691	13,527	11,491
c)	Total Area of Building by consider **25 sqm** per PHP (b x 25)	3,67,275	3,38,175	2,87,275
d)	Existing Area (sqm)	1,17,339	1,17,339	1,17,339
e)	Additional Area required (sqm) for combined II and III CP. (c – d)	2,49,936	2,20,836	1,69,936
f)	Total combined Area (II + III CP) proposed by GHIAL in 3rd Control Period (sqm)	2,48,809		
g)	Area already proposed in 2nd control period (sqm).	1,01,175	1,01,175	1,01,175
h)	Area evaluated in 3rd control period only (sqm)	1,47,634	1,19,661	68,761
i)	Cost per sqm for 2nd control period including GST @6% (Rs)	1,29,813.96	1,29,813.96	1,29,813.96
j)	Cost per sqm for 3rd control period including GST @6% but excluding inflation (Rs)	1,29,813.96	1,29,813.96	1,29,813.96
k)	Cost per sqm for 3rd control period by providing the inflation for two years @ 3.02% and GST @6% (Rs)	1,37,773.12	1,37,773.12	1,37,773.12
l)	Cost of Terminal Building for 2nd Control Period (Crores) (g X i)	1,313.39	1,313.39	1,313.39
m)	Cost of Terminal Building for 3rd Control Period without inflation (Crores) (h X j)	1,916.50	1,553.37	892.61
n)	Cost of Terminal Building for 3rd Control Period by considering inflation for two years (Crores) (h X k)	2,034.00	1,648.61	947.34
o)	**Total cost of Terminal Building Without inflation for 2nd and 3rd control period (Crores) (l + m)**	**3,229.89**	**2,866.76**	**2,206.01**
p)	**Total cost of Terminal Building With inflation for 2nd and 3rd control period (Crores) (l + n)**	**3,347.39**	**2,962.00**	**2,260.73**

As discussed with AERA, we have evaluated the cost for the above three options. The selection of one of the above options may be decided by AERA.

Details of PO's of Terminal Building submitted by GHIAL is given below:

An amount of Rs. 2658.32 Crores (including Preliminaries, Labour cess and GST) is catered in the proposal for expansion of the passenger Terminal Building. This includes awarded work of 2343.42 Crores to L & T , 71.22 Crores to other vendors (For communication Room, structured cabling system of new PTB, Access control System , PAVA System, SITC of ATRS and other systems) and Lump sum estimated works of 243.67 Crores for additional balance miscellaneous work (Like Airport Village weather Proof and facade ,Artwork, Airport seating, Reserved Lounges ,Furniture ,fit out and Interface ,SOCC, Retail shell & Core, balance enabling work & IT Packages) Thus the gross cost of PTB is **2658.32** Crores,

An amount of Rs. 2343.42 Crores (including Preliminaries (distributed to each subhead of Building), Labour cess @1% and GST @18%) is awarded to L & T for expansion of the passenger terminal building which includes Civil structures & Finishing work ,HVAC System Electrical supply systems, Low & extra Low voltage system ,Plumbing & firefighting systems, Elevators & escalators, Furniture and Signage. It also includes Demolition (8.14 Crores) and Modification (17.56 Crores) works in existing Terminal.

Preliminaries and General Requirement cost is **266.96** Crores (Nearly 16.3 % of basic cost (**1636.68)** of Expansion of PTB).

The break-up of the PO's cost (2343.42) awarded to L&T is as below:

Preliminaries		Rs.**266.906** Crores
Basic Civil structures and Finishing works	-	Rs.**1197.286** Crores.
MEP Systems (Like HVAC System Electrical supply systems, Low and extra Low voltage system, Plumbing and Firefighting systems, Elevators and escalators)	-	Rs. **393.918** Crores
Furniture (15.385) and Signage (4.375).	-	Rs. **19.76** Crores
Demolition (8.147) /Modification (17.564) in existing PTB	-	Rs.**25.711** Crores
Labour cess (19.03 Cr) and GST (346.11Cr)	**-**	**Rs.365.14 Crores**
Mezzanine Floor (In east & west pier incl. Taxes)	-	Rs.**73.71 Crores**
Additional GST	**-**	**Rs.0.975 Crores**

MEP SYSTEMS

A basic cost without loading Preliminaries, Labour cess and GST of Rs. **393.918** Crores has been proposed in the capital cost towards HVAC System (84.767 Crores), Electrical supply systems (18.256 Crores), Low (124.516 Crores) & extra Low (8.109 Crores) voltage system, Plumbing and firefighting systems (92.591), Elevators and escalators (65.679 Crores).

For electrical supply system with low and very low voltage system, combined cost is **150.881** Crores which works out to 12.602% of the estimated cost of civil works (1197.286 Crores). These costs have been arrived at on the basis of statement submitted by GHIAL.

In addition to L&T, 71.22 Crores work is awarded to other 45 vendors (For communication Room (4.733 Cr), structured cabling system of New PTB (9.18Cr.), Access control System (12.036), PAVA System (10.778 Cr.), SITC of ATRS (13.683) and other small works. Out of 72.22 Crores 9.788 Crores are civil works and balance 61.432 Crores are Electrical and allied works.

Lump sum estimated works of 243.67 Crores for additional miscellaneous balance works like Airport Village weather Proof (30.70 Cr.), Artwork (20.00 Cr.), Airport Village facade (27.00Cr.), Airport seating (18.00 Cr.), Reserved Lounges (18.00 Cr.), Furniture (18.00Cr.) , Office fit out and Expansion Interface (14.00 Cr.), SOCC (3.00 Cr.), Retail shell & Core(38.70 Cr.), Landscape (4.00 Cr.) balance enabling work & IT Packages30.30 and 20.00 Cr. Out of this 243.67 Crores, 50.30 is electrical & allied and the balance 193.37 is for civil related work.

AIRPORT SYSTEMS

A total cost of Rs. 1070.00 Crores is catered towards airport systems including Passenger Boarding Bridges, Screening system, Baggage Handling System, People Movers (Elevators, Escalators & Travellators), VDGS and GPU system.

Out of total work of Airport system, 1029.03 Cr. are already awarded and estimate of 40.97 Cr. is submitted for balance works. Out of 1029.03 awarded value for Megawide (875.04 Crores which includes preliminaries for 94.00 Crores), Beumer (138.32) and other agencies (15.67 Crores for installations and local supplies). The BHS alone amounts to Rs. 365 Crores. The passenger boarding bridge and screening systems put together cost 392 Crores. The costs are based on submission by GHIAL.

5.2.3. EXPANSION OF THE KERB AND APPROACH RAMP

An amount of Rs. 156.40 Crores is catered in the proposal for expansion of the kerb and approach ramp. This constitutes approx. 2.80 % of the total cost proposal (5596.24Crores). Out of 156.40 Crores, **146.767** Crores is awarded contract value submitted by GHIAL to VNC for Construction of 4 lane approach ramp and 0.98 Crores to Godrej for SITC of UVSS, BOLLARD and barriers. Provisional estimate of 5.5 Crores for Airport name signage and Landscaping around Ramp area is kept on Lump sum basis. Main work (146.767 Cr.) catered for Bridge PCC and RCC (58.963 Cr.),

Reinforced earth wall (4.75 Cr.), Fabric roof canopy (14.284 Cr.), Road work (9.996 Cr.), Barricading, temporary road and Preliminaries (15.452 Cr.), Miscellaneous additional & variation work. (12.978 Cr).

5.2.4. EXPANSION OF THE APRON AND TAXIWAY- COST EVALUATION

An amount of Rs. **895.66** Crores is catered for Airside works out of which the work awarded to L& T for **637.76 Crores**, MVR for 143.95 Crores, VNC for 56.241 Crores, others (20 vendors) for 18.43 Crores and lump sum estimate is submitted for balance work in Bravo Taxiway (39.74 Crores) is taken in the Capital Expenditure for expansion of apron, Taxiway and associated works. The amount is based on statement given by GHIAL.

The major constituents of 637.76 Crores include:

Taxiway, Aprons, Roads and Surface Drainage	-	391.26 Cr
AGL & Apron Electrical System	-	30.83 Cr
Airside firefighting and Fire Alarm Systems	-	9.45 Cr
Aviation Fuel Hydrant System	-	12.03 Cr
Amount of Preliminaries and General requirement for above	-	72.336 Cr
Amount of Labour cess (5.15 Cr.) and GST (93.80Cr.) for above	-	98.96 Cr
Others		
(Provisional Sum elected for 2 No. of RET's		
Including 1% labour cess and 18% GST)	-	22.900 Cr

Details of work awarded to MVR for 143.95 Crores are as under.

Drainage work	-	16.521 Cr
Pavements	-	74.337 Cr
Electrical work and AGL	-	8.576 Cr
S/I/T/C CCTV System	-	1.177 Cr
Fire Hydrant System	-	1.052 Cr
Fuel Hydrant System	-	16.80 Cr
Marking & Sign	-	0.151 Cr.
Precast boundary Wall	-	1.341 Cr
Fuel Hydrant & airfield Ground lighting system	-	1.735 Cr
GST	-	21.904 Cr

As per PO details from GHIAL to VNC for 56.241 Crores (includes Apron expansion (35.001 Cr and Southern Apron earthwork (21.240 Cr).

As per PO details From GHIAL to others (20 vendors) for 18.43 Crores (S/I/T/C Fuel Hydrant system at West Apron & various electrical systems).

Lump sum estimate for balance work in Bravo Taxiway (39.74 Crores) is taken in the Capital Expenditure, for expansion of apron, Taxiway and associated balance works like site investigation, Barricading, Earthwork, Pavement Crust Layers, Drainage & Culverts, AGL Signage etc. The amount is based on statement submitted by GHIAL.

The total area proposed for expansion of Apron is 2,37,565 sqm and Taxiway is 4,64,631 sqm. (Total 702196). Total cost is 895.66 Crores (includes preliminaries, taxes). Cost per sqm works out to Rs. 12755.12per sqm. This is inclusive of all other associated works such as AGL & Apron Electrical System, Airside firefighting and Fire Alarm Systems, Aviation Fuel Hydrant System, Preliminaries and General requirement for above, Amount of Labour cess and GST for above, Provisional Sum elected for 2 No. of RET's with 1% labour cess & 18% GST).

The average cost of aircraft movement area (pavements) works to Rs. 12755.12Cores as against AERA norms of Rs.4, 700/sqm.

For arriving at the cost, GHIAL has adopted only summation statement for PO's issued for the work.

During the review of cost of Airside works, RITES has adopted the same procedure that has been adopted to calculate the cost as for terminal building (Para 5.2.2) and the per unit area cost of airside works for 2nd control period is worked out as Rs. 9909.55 (including GST) per sqm and for 3rd control period is worked out as Rs. 10517.12 per sqm (including GST and inflation for two years).

The cost of Airside works by considering inflation for 3rd control period:

The cost of Airside works for 2nd control period = 118734 (sqm) X Rs. 9909.55= 1176600000

The cost of Airside works for 3rd control period = 583464 (sqm) X Rs. 10517.12=6136361003

= Rs. 731.30 Crores

The cost of Airside works without considering the inflation for 3rd control period:

The cost of Airside works for 2nd and 3rd control period = 702198 (sqm) X Rs. 9909.55

= Rs. 6958463177

= Rs. 695.85 Crores

Based on the above observations, the cost of the total Airside works has been reworked for both the cases by considering the inflation and without inflation and the cost comes out to be Rs. 731.30 Crores and 695.85 Crores respectively against Rs. 895.66 Crores.

5.2.5. ROAD INFRASTRUCTURE

An amount of 167.00 Crores is catered in Capital Expenditure for Road Infrastructure including main access road & elevated roads (Rotary 1 to VVIP gate). Out of this amount, Rs. 24.23 Crores work is awarded to M/s VNC by GHIAL and for balance works, an estimate of Rs.142.76 Crores is submitted. On preliminary scrutiny the total cost of road infrastructure comes out to Rs. 104.28 Crores.

The cost of widening of existing 4 lane to 8 lane road of length 05 km has been corrected to 42.15 Crore. If the widening is considered as 06 lane road for 26.85 MPPA than the corrected cost of this road will be 21.08 Crores. The combined cost will come out to Rs. 83.21 crores including cost of flyover.

5.2.6. GSE TUNNEL

An amount of 82.81 Cores is considered for GSE Tunnel work awarded to L& T as per statement of GHIAL. Details are as under.

Basic cost of GSE Tunnel	-	59.77 Cr
Preliminaries.	-	9.747 Cr
Labour cess (0.695 Cr.) and GST (12.598 Cr)	-	13.293 Cr

5.2.7. ICT

As reported by GHIAL, the CAPEX proposed towards ICT during CP-2 was Rs. 48.90 Cr, which has become RS. 276.40 Crores during the CAPEX proposal for combined CP – 2 & 3, which is apparently disproportionate in view of the increase in proposed expansion. However, GHIAL has clarified that the above increase in cost due to technology upgradation, like introduction of 4G & 5G, wi-fi infrastructure and full roll out of E-boarding etc. the justification is found to be in order.

However, the ICT does not have a separate cost head in the CAPEX as it has been calculated under the per sqm area cost of CP-2 duly enhanced by inflation and GST component.

Details of ICT equipment is attached at Annexure – 4.

5.2.8. OTHERS

The capital cost proposal submitted by GMR comprise the following provisions:

5.2.8.1. PRELIMINARIES, INSURANCES AND PERMITS

An amount of Rs. 348.99 Crores is provisioned in the capital cost proposal towards preliminaries @ 16.308% of the Basic cost of works excluding Cess & GST etc. This amount of preliminaries refers to Expansion works awarded to L & T for PTB (266.906 Crores), Apron & Taxiway (72.338 Crores) and GSE Tunnel (9.747), whereas the cost of awarded work for these three is 3063.99 Crores. The amount is said to be catered Mainly for Site overheads and running cost(65.156Cr.) ,Head office overheads(62.25Cr.) ,provision of contractor's insurance Professional indemnity in respect of Contractor's design obligations(6.508Cr.), temporary Barricading(11.634Cr), Establishment, Operation, Maintenance and removal of Contractor's labour camp, Contractors equipment, Fabrication yard ,store stock yard ,test labs and other facilities as required for execution of Expansion work(32.071Cr) ,Deployment of consultant (Design services 63.50 Cr.), plant and tools like Tower cranes (8.258 Cr.) and other preliminaries and general requirement (6.030Cr). For Phase 2 part 82.96 Cr. is catered Lump sum basis.

Similarly, Preliminaries are included in Airport System work awarded to Megawide (80.301Crores excluding GST).

However, an amount of Rs. 120.10 Crores is also provisioned towards preliminaries, insurance & permits in the capital cost proposal @ approx. 2.39% of the Proposed Capital hard cost of works (i.e.,5030.19 Crores). The breakup of 26.50 Crores are Building permission fee (7.968 cr.) and various insurances and preoperative expenses are incurred and 93.60 Crores is estimated lump sum basis for future expenses.

After the review of preliminaries, insurance & permits cost restricted to 98.35 Crores against 120.10 Crores.

5.2.8.2. DESIGN DEVELOPMENT AND PMC

An amount of Rs. 202.94 Crores is provisioned in the capital cost proposal @ 4.03% of the Proposed Capital hard cost (i.e. 5030.19 Crores) of works towards design development and PMC work. Out of this 38.56 Crores is towards various design development consignments like APRON consultant (RAMBOLL), Design consultancy work for PTB expansion works (MAINHARDT SINGAPORE PTE LIM/20.932 Crores), Master planning consultant (LANDRUM & BROWN 2.358 Crores), PTB design review (MAINHARDT 1.294 Crores), Legal support services (3.192 Crores), and other miscellaneous works.

Details of the design development as discussed above have been provided in the table No. 5.15 given below.

Table 5.15 Details of 38.56 Crores is towards various design development works given by GHIAL

S No.	Scope	Name of the Consultant	Amount (include Taxes)
1	APRON consultant	RAMBOLL	574,53,009
2	4 lane approach ramp consultant	SUNDARAM ARCHITECTS PVT LTD	81,00,000
3	Design Consultancy Services for PTB Expansion Works	MEINHARDT SINGAPORE PTE LIM	2093,18,536
4	Master planning consultant	LANDRUM & BROWN	235,82,920
5	Fuel hydrant consultant	HARY K60 AVIONICS & CONSULTANT	17,93,425
6	Soil investigation	GEO TECHNOLOGIES	19,97,665
7	Environmental impact assessment study	VIMTA LABS	33,92,500
8	Environmental impact assessment study for 25mppa to 50 mppa	VIMTA LABS	21,24,000
9	Contractor appointment for providing qa & qc services for expansion project	RINA	134,36,282
10	Surveying of taxiway	SURVEYING & ENGINEERING	59,738
11	Survey & Contour survey for demarcated area of around 40 acres	SURVEYING & ENGINEERING	57,500
12	Topographical Survey for RAMP expansion	SURVEYING & ENGINEERING	1,12,499
13	TOPOGRAPHIC SURVEY WORKS ADDNL AREA	SURVEYING & ENGINEERING	95,939
14	For trafic study	IBI Consultancy	15,00,960
15	Providing Consultancy Services for reviewing Contractor's design for PTB structure including structural steel and roof system	MEINHARDT INTERNATIONAL INFRASTRUCTURE PTE. LTD.	129,42,000
16	Design Consultancy Services for simulation modeling of PTB terminal, Rajiv Gandhi International Airport	AIRPORT RESEARCH CENTER GMBH	84,01,181
17	Legal support services for expansion works	Link legal	319,16,640
18	Design Consultancy Services for Passive Network Infrastructure development	Optimetrix integration and Solutions Private limited	64,78,200
19	Consultancy services for the proposed interior landscape works	Oracles	28,32,000
			3855,94,993

Out of the total 202.94 Crores, PMC work done by GMR Airport developers Limited for 154.93 Crores, Lump sum provision for 9.50 Crores is kept for Balance design elements and the details of remaining 38.56 Crores has been provided in the table given above.

5.2.8.3. CONTINGENCIES

An amount of Rs. 243.01 is provisioned in the capital cost proposal @ 4.83% of the proposed hard cost (i.e., 5030.19 Crores). The provision of contingencies is towards physical contingencies including any modification to the scope of the work and unforeseen work. Considering the magnitude of the project the provision of 3% towards contingencies is considered adequate as presently followed by Govt. organization such as AAI & CPWD.

5.3. CONSTRUCTION SCHEDULE

GHIAL has submitted the overall implementation schedule for the 2nd Control period and 3rd Control Period with date of commencement as August 2017 and expected completion in September 2023 i.e., spanning over a period of 6 years.

As per the Program chart provided by GHIAL, the construction of Terminal Building started in Oct 2018 and is expected to be completed in Sept 2022 i.e., spanning over a period of 4 Years. The time period for construction stipulated by AAI in some of the tenders for airport terminal building projects for Project Management Consultancy including design and supervision is 9 months planning & design and 36 months for construction.

Hence the time period of 04 years as proposed by GHIAL for construction of Terminal building is considered to be reasonable.

However, GHIAL has stated that expansion work for 12 MPPA to 20 MPPA was expected to be completed by 2021 but the actual award of work for 2nd control period was delayed by one year and the implementation is also extended by one year for which the cost of construction is increased due to inflation. **The delay in award of work and in the implementation by one year each along with financial implication of inflation may be reviewed by AERA.**

5.4. PROCEDURE ADOPTED IN THE AWARD OF WORK

The GHIAL has submitted the procedure adopted in award of the work for Terminal building for a value of Rs. 3946.39 Crores, wherein it is observed that GHAIL had received 04 bids and out of these, 03 bidders were qualified. After evaluation of the bids, M/s L & T was found as L1 bidder and M/s Megawide as the L2 bidder.

After opening of the bids and various stages of negotiations, the work was split into two parts and both the bidders were instructed to submit the revised proposal. Based on the revised proposal of split packages the package 1 (Civil and Finishes, MEP, Elevators, Escalators, GSE tunnel, Furniture and signages) was awarded to M/S L&T Ltd and package 2 (Airport Systems) was awarded to M/s Megawide construction corporation. The GHIAL has concluded that by splitting the contracts they were able to save Rs. 50.20 Crores.

Splitting of bids after its opening is a deviation from the normal procedure, as the scope of work is not revised after bid opening. Further, had the splitting been done prior to bid invitation, there could have been more participants and thus more competition.

GHIAL has awarded the work of Design & PMC at a cost of Rs. 202.94 Crores. Further, GHIAL has tried to justify the same by comparing the percentage fee in current proposal with the previous CAPEX proposals examined by RITES. The design & PMC fee, which is 4.03 % in the subject proposal would have been acceptable provided the size of project was comparable with previous examples. However, the size of project in the subject proposal is much more and the % age fee was bound to decrease considerably.

Giving PMC of the aforesaid magnitude on nomination is a deviation from standard practice. In this case reducing the PMC & Design fee to 3% of the hard cost (Refer S. No. - 6 of Table No. 6.1, 6.2 & 6.3 for different traffic scenarios) can be considered as justified and the same has been applied in CAPEX evaluation.

6. FINDINGS

6.1. FINDINGS

The findings of the exercise with reference to scope of work are summarized as under:

a) *To examine the proposal of the airport and assess the need for the proposed project and its capacity/scope with reference to Passenger growth upto 34 MPPA /Cargo Volumes/Air Traffic Movement and also to suggest cost effective alternatives.*

1. **As brought out under para 5.1.2, the Terminal Building expansion proposal of GHIAL is commensurate to the traffic of 34 MPPA. However, the same is unlikely to be achieved by the end of third control period.**
2. **However, in accordance with the findings of ICF, discussed under chapter 03, the traffic of 34 MPPA is likely to be achieved by the year 2029-30.**
3. **Since the expansion works have already been undertaken, the option of reduction in area of Terminal Building is technically not feasible.**

b) *To examine the building standards and designs proposed by the airport operator in line with IMG norms/IATA/ICAO norms*

The existing terminal building was commissioned in 2008 before issue of guidelines on area norms by the Inter-Ministerial Group. The IMG norms have been considered for evaluating the present proposal (Deliberated in para 5.1.2)

The expansion area of 2,48,809 sqm for integrated terminal building meets the requirements of IMG norms of an Integrated Terminal for 34 MPPA.

c) *To analyze the reasonableness of the proposed cost with reference to the tentative ceiling decided by Authority vide order no. 7 dated 13/06/2016 based on the details of the rates and quantity as per government/industry approved norms and advise the Authority on the reasonableness of the costs*

As discussed under para 4.2, the unit rates recommended by RITES in its report for the 2nd control period were consistent with the Authority's order No. 7 dated 13/06/2016.

Since the development works have now been clubbed for 2nd and 3rd control period, an annual inflation of 3.02% in accordance with CIDC index has been considered for the portion falling beyond the end of 2nd control period i.e. from 2021-23.

Additional implication @ 6% for GST considered by GHIAL is found to be in order and added to the unit rates. Accordingly, per sqm rate for Terminal Building for 2nd & 3rd control period works out to Rs. 1,29,813.96 and Rs. 1,37,773.12 respectively.

However, GHIAL has considered unit rate of Rs. 1,46,713 per sqm for Terminal Building for the combined development of control period 2nd & 3rd.

The correction in unit rates of Airside works like Apron, Taxiways etc. on account of correction in rate of inflation has also been applied.

The cost of widening of existing 4 lane to 8 lane road of 05 km length has been corrected to Rs. 42.15 Crores. If the widening is considered as 06 lane road for traffic of 26.85 MPPA, then the corrected cost of this road will be Rs. 21.08 Crores. The combined cost will come out to Rs. 83.21 crores including cost of flyover.

The cost of Design & PMC has been reduced as discussed under para 5.4. Cost of Preliminaries and other miscellaneous provision have been also reduced in proportion to hard cost of construction.

Taking into consideration the above, a comparison of CAPEX prepared by GHIAL and the corrected ones by RITES for the three-traffic scenario i.e., 34 MPPA, 31.4 MPPA and 26.85 MPPA has been presented in the following three tables.

Table 6.1 CAPEX Evaluation for Scenario 1 - 34 MPPA

SN	Item	Capital Cost as proposed by GHIAL (in Rs. Crores)	Revision in Capital Cost suggested (in Rs. Crores) (With inflation/Option 1)	Revision in Capital Cost suggested (in Rs. Crores) (Without inflation/Option 2)
1	Expansion of the Terminal Building with Airport System	3728.32	3347.39	3229.89
2	Expansion of the Kerb & Approach ramp	156.40	156.40	156.40
3	Expansion of Apron and Taxiways	895.66	731.30	695.85
4	Road Infrastructure	167.00	104.28	104.28
5	GSE Tunnel	82.81	82.81	82.81
	Sub-Total	**5030.19**	**4422.18**	**4269.22**
4	Preliminaries	120.10	98.35	94.95
5	Insurance and Permits			
6	Design Development & PMC	202.94	132.67	128.08
7	Contingencies	243.01	132.67	128.08
		5596.24	**4785.86**	**4620.33**

Table 6.2 CAPEX Evaluation for Scenario 2 - 31.4 MPPA

SN	Item	Capital Cost as proposed by GHIAL (in Rs. Crores)	Revision in Capital Cost suggested (in Rs. Crores) (With inflation/Option 1)	Revision in Capital Cost suggested (in Rs. Crores) (Without inflation/Option 2)
1	Expansion of the Terminal Building with Airport System	3728.32	2962.00	2866.76
2	Expansion of the Kerb & Approach ramp	156.40	156.40	156.40
3	Expansion of Apron and Taxiways	895.66	731.30	695.85
4	Road Infrastructure	167.00	104.28	104.28
5	GSE Tunnel	82.81	82.81	82.81
	Sub-Total	**5030.19**	**4036.79**	**3906.10**
4	Preliminaries	120.10	89.78	86.87
5	Insurance and Permits			
6	Design Development & PMC	202.94	121.10	117.18
7	Contingencies	243.01	121.10	117.18
		5596.24	**4368.78**	**4227.34**

Table 6.3 CAPEX Evaluation for Scenario 3- 26.85 MPPA

SN	Item	Capital Cost as proposed by GHIAL (in Rs. Crores)	Revision in Capital Cost suggested (in Rs. Crores) (With inflation/Option 1)	Revision in Capital Cost suggested (in Rs. Crores) (Without inflation/Option 2)
1	Expansion of the Terminal Building with Airport System	3728.32	2260.73	2206.01
2	Expansion of the Kerb & Approach ramp	156.40	156.40	156.40
3	Expansion of Apron and Taxiways	895.66	731.30	695.85
4	Road Infrastructure	167.00	82.31	82.31
5	GSE Tunnel	82.81	82.81	82.81
	Sub-Total	**5030.19**	**3313.55**	**3223.38**
4	Preliminaries	120.10	73.69	71.69
5	Insurance and Permits			
6	Design Development & PMC	202.94	99.41	96.70
7	Contingencies	243.01	99.41	96.70
		5596.24	**3586.06**	**3488.47**

d) *To review designs and specifications proposed in case the costs are assessed to be excessive where the Projects are already in progress or the contracts are already awarded. Further to examine whether proper procedures have been followed in the award of the work.*

The design & specifications proposed for Terminal Building & other works can be considered generally in order keeping in the view the best industry practices.

As informed by GHIAL, in the procedure for the awarding of work, it is noted that major works contract have been awarded based on competitive bids, however, the PMC of value Rs. 154.92 crores has been awarded by GHIAL to its own company without any competition. We are of the opinion that if the GHIAL had invited bids for the PMC work, then due to competition, the GHIAL could have been able to receive lower bid than at the cost at which it has awarded the work to GADL. With PMC of the of such a high magnitude on nomination is a deviation from standard practice. In this case reducing the PMC & Design fee to 3% of the hard cost has been considered as justified.

The best industry practice also demands for detailed cost estimation of work before inviting the bids, which is not provided by GHIAL.

The procedure followed in the award of work is already deliberated in the para no. 5.4 above. We are of the opinion that if the work had been split before call of tenders than it may have attracted more bids in place of 4 bids due to lower qualifying criteria of work.

e) *To review and justify the reasonableness of time schedule of completion of work of proposed by HIAL*

The time schedule proposed by GHIAL is considered adequate and reasonable. However, the delay in award of work may be reviewed appropriately by AERA.

***

6.2. ANNEXURES

1) Annexure – 1 Minutes of AUCC for third control period.
2) Annexure – 2 Procedure of splitting the award of work to L1 and L2 Bidder.
3) Annexure – 3 Night Parking requirement of various Airlines.
4) Annexure – 4 ICT Equipment Details

Annexure 1 (1C

HYDERABAD RAJIV GANDHI INTERNATIONAL AIRPORT

GMR Hyderabad International Airport Limited

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Date 15.10.2018
Letter No. GHIAL/2018-19/SPG/1381

भारतीय विमानपत्तन आर्थिक विनिमायक प्राधिकरण
सफदरजंग एयरपोर्ट, नई दिल्ली–110003
प्राप्त
डायरी नं० 13005
तारीख 17/10/18

The Secretary
Airports Economic Regulatory Authority of India
AERA Building, Administrative Complex,
Safdarjung Airport, New Delhi 110003

Respected Madam,

Sub: Minutes of AUCC Meeting for Expansion Program of RGIA

Further to our communication inviting you to participate in our AUCC process, we would like to apprise you that we have successfully conducted AUCC meeting on September 7, 2018 apprising the stakeholders of our expansion program to take terminal capacity to 34 million annual passenger (MAP) from present level of 12 million annual passenger together with matching airside and landside infrastructure provisioning.

We would like to highlight that the stakeholders were well appreciative of requirement of creating additional infrastructure to take the capacity to 34 MAP in order to meet the current and future demand.

The minutes of the meeting is attached for your perusal and record.

For GMR Hyderabad International Airport Limited

K Narayana Rao
Authorised Signatory

Encl: Minutes of AUCC meeting

Corporate Office:
IBC Knowledge Park, Phase 2,
'D'Block, 10th Floor, 4/1,
Bannerghatta Road, Bangalore 560 029

Minutes of the Meeting

Subject:	AUCC Meeting on Airport Expansion & Capex Plans of GMR Hyderabad International Airport Limited (GHIAL)	**Date:** 07th September 2018
Venue:	Novotel Hyderabad Hotel	**Time:** 10:30 - 13:00 Hrs.

Attendees- Stakeholders	Attendees GMR
1. Anurag Sharma – Executive Officer, CII	1. SGK Kishore – CEO, GHIAL
2. Rajat Kumar – VP, Indigo	2. Pradeep Panicker – Dy. CEO, GHIAL
3. Rajesh V – APM, TRUJET	3. Rajesh Arora – CFO, GHIAL
4. Ujjwal Dey – Associate director, FIA	4. Manish Sinha – COO, GHIAL
5. Naozad Dastur, Director AOCS, Indigo	5. Ravindar Reddy – CDO, GHAIL
6. Laurence Jacobi – Cargo Manager, Emirates Sky Cargo	6. KBS Sarma – CLO, GHIAL
7. Satyan Nayar – Security General, APAO	7. Bharat Kumar Kamdar - Head Security, GHIAL
8. Paul Vijayan I – SM, Malaysian Airlines	8. V.N.V. Bhadra Rao – Head Planning, GADL
9. M Venkateshwarlu – President, TECCI	9. Saurabh Kumar – CEO, HDF
10. Ebenezer M.J. – ASM, Oman Air	10. Venu Madhav – CFO, HDF
11. Srinivas N – Manager, Lufthansa Cargo	11. Sandip S. Ray – GM-F&A, GHIAL
12. Manish S – Director, FICCI	12. Harsh Gulati – Head Regulatory, GAL
13. Dushyant Deep– Sr. Legal Council, Indigo	13. Shweta Saini – Manager- F&A, GHIAL
14. Abdul Raheem – ASM, Flydubai	14. Ramakrishna Allada – Manager- F&A, GHIAL
15. Narayana – DM, Thai Airway	15. Other team members
16. Lily Correa – APM, British Airways	
17. Sunil Menon – ASM, Cathay Pacific	
18. Sreejith Menon – Station Manager, Air Asia	
19. Sonali Chowdhury Khaire – APM, Air India	
20. Ayoob M – GM(ATM), AAI	
21. Yoga Narasimhan – Senior VP, AI SATS	
22. J. Sridhar – Sys Manager, Bluedart	

Summary of the Proceedings

1. Ms. Shweta Saini welcomed the gathering and gave an overview of the proceedings for the day. She then invited Mr. SGK Kishore (CEO, GHIAL) to give his initial remarks on the AUCC meeting.

2. Mr. Kishore welcomed all the stakeholders and service partners. He briefly explained the gathering on the strong growth trajectory and growth of passenger traffic over the years. He deliberated that the Indian aviation sector has seen a continuous double digit growth in the last 50 months. He said that the government has also been very pro- active in addressing the

issues and pain points pertaining to the aviation sector be it airports, airlines, air navigation etc. He further stated that the Government is focused towards sustaining this double digit growth and has identified the following 3-4 major areas, which should be addressed in advance in order to capitalize the potential of India so as to make it the world's biggest aviation market by 2030:

a. To be future ready in terms of airport infrastructure to supplement the huge order book of airlines.
b. To optimize the air navigation system in order to maximize the airside capacity
c. To develop the skilled manpower to cater to this growth – pilots, airside experts, air navigators etc.

He reminded the stakeholders that in 2015 GHIAL conducted AUCC for 20 Million Pax Per Annum (MPPA) expansion plan. However, while the clarity on acceptable level of per sqm capital cost took some time, the airport traffic continued to grow and GHIAL took the following steps towards ensuring provision of sufficient capacity for the immediate future as well as for the longer term:

a) **Revision of Master Plan** - GHIAL has reviewed the master plan considering the anticipated improvements in air navigation technologies and potential to maximize the overall handling capacity in line with the demand trends:

- GHIAL engaged the services of Landrum & Brown, USA, an international consultant in aviation planning and development, to re-assess the airside capacity. L&B reassessed airside capacity of current runway as 34MPPA+ considering 51 peak hour ATMs.

- GHIAL also engaged the services of NATS, UK, a global leader in Air Traffic Control and Airport Performance Consultancy, who also confirmed that the existing runway capacity can be taken to 51 peak hour ATMs.

- ICF Limited, another international consulting firm was engaged to study the traffic forecast which has projected the expected passenger traffic at RGIA to reach 35 million by FY24 which translate to CAGR of ~11.5% over FY18 traffic.

- Therefore, given the current aircraft mix, it is possible to enhance the existing terminal's capacity to 34 MPPA as against the originally planned capacity of 20 MPPA. Post review of master plan the ultimate capacity of the airport is now expected to be about 80 MPPA as against the earlier assessed capacity of 40 MPPA.

- There is a huge demand for night parking stands in Hyderabad from the airlines as they are getting large number of new aircraft delivered in near future;

- In order to address the growth, the earlier plan of enhancing the capacity to 20 MPPA is revisited and revised to 34 MPPA.

- This shall bring in significant efficiency in capital spend as the existing airside infrastructure can be optimally utilized

b) **Capex Reconfiguration**- The regulator scrutinized the capex to increase capacity to 20 MPPA as submitted by us as part of our tariff application for the 2nd control period and the regulator engaged M/s RITES to assess the reasonableness of capital cost estimates. Based on the recommendations of RITES, regulator indicated per sqm capital cost. Meanwhile, GHIAL worked on the long term solution to offer superior passenger experience and zeroed down on merging of subsequent phases of capex to create capacity little ahead of time as expansion of an operational airport has its fair share of challenges. Considering the master plan and the traffic forecast, the convergent capacity for expansion configured at 34 MPPA.

   Endeavor would be to complete the proposed expansion of 34 MPPA broadly in line with the capital cost estimates arrived at by RITES except for the inflationary increase and additional tax implications due to migration of tax regime to GST. The stakeholders were informed by CEO that the cost would be discovered through competitive price discovery mechanism.

c) **Technology adoption**- Apart from creation of infrastructure, amplified focus is given to embrace technology in a big way to offer smart solutions to the passengers to make the airport future proof. Hyderabad airport has been at the forefront in implementing digital technologies in the past. RGIA has been the pioneer in implementation of removal of hand baggage tag stamping, express check-in and E-Boarding for complete paperless travel. The Government also is keen and pursuing Digi Yatra for promoting seamless and non-intrusive passenger facing processes. In line with government's vision we are also introducing new technological solutions as part of the expansion such as bio metric face recognition, self-bag drop, E Boarding to international passengers which are cost effective and functionally more efficient.

CEO requested the stakeholders to support and cooperate during the expansion to ensure passenger experience and service quality.

Subsequently, Ms. Shweta Saini invited Mr. Manish Sinha (COO, GHIAL) to present the Expansion & Capex plans to the stakeholders.

Mr. Manish Sinha gave a detailed presentation explaining all key aspects of the proposed airport expansion and capex plans. He informed that the Airport is currently handling 150% passenger traffic of its original design capacity and expansion is urgently needed. He explained that the company has reviewed the revised Master Plan and the capacity on the Southern side has been maximized to fully utilize the capacity potential offered by the existing runway and airside. This would also provide significant capital efficiency by doubling the overall airport capacity beyond 80 MPPA. The development/implementation strategy was also detailed highlighting how capacity is to be added ahead of demand followed by the Schematic diagram of the expanded terminal along with complete information on individual elements of the expanded facility. He also gave an overview of the short term interim facilities created /being created to tide over the 3-4 year period while the expansion progresses towards completion.

The presentation included the following topics in detail:

- Background
- Traffic growth & projections

- Need/Rationale for expansion
- Initiatives/Projects undertaken to Address Growth
- Review of Master Plan
- Overall Expansion concept
- Details of the expansion including the following:
    - Ramp & Kerb-side
    - Forecourt & Entry gates
    - Check-in counters incl. self-services provisions
    - Security channels
    - Emigration & Immigration counters
    - Baggage carousels
    - Contact stands /Boarding gates
    - Airside Development Plan
    - Allied Infrastructure
- Summary of infrastructure additions that are part of the expansion
- Estimated Capex for the Expansion
- Other Projects- Metro Connectivity to RGIA

Post the detailed presentation by Mr. Manish Sinha, the floor was made open for Q&A session which was moderated by Mr. SGK Kishore. The summary of the Q&A session is as follows.

Q#1 Mr. Rajat Kumar, (Indigo)

Currently, there are 42 parking stands and 33 (16 international and 17 domestic) upcoming contact stands and also 48 remote contact stand which makes it to 123 parking stand. However, it has been mentioned that there will be only 101 parking stands (slide #16 from the presentation displayed). So, what will be the total number of aircraft stands available?

GHIAL Response:

The expansion entails 101 parking stands which includes 56 remote contact stands and 45 contact stands. Few existing stands would cease to exist due to reconfiguration of the piers.

Q#2 Mr. Rajat Kumar, (Indigo)

There are already code C aircraft compatible parking stand. Is there any other bifurcation in the parking stand for smaller aircraft?

GHIAL Response: Aside from code C stand, there will be 4 small aircraft remote stand. The small aircraft remote stand is provisioned keeping in view the importance of Hyderabad Airport in promotion of RCS.

Q#3 Mr. Rajat Kumar, (Indigo)

Existing runway ATM capacity is considered at 51 - how it is being achieved? What is the inter arrival separation and ROT considered? What is the current inter-arrival separation and what should be the inter-arrival separation and the ROTs?

GHIAL Response: Presently, the per hour peak ATM approved is 36 with declared 8 nautical miles inter-arrival separation. We intend to bring it down in phased manner over the period of time. GHIAL is working with AAI to bring it down to 7 nautical miles within 18 months which will augment the capacity to 42 ATM. For 51 ATM, the inter-arrival movements should be 5-6 nautical miles and around 51 secs ROT for A320/B737.

Q#4 Mr. Rajat Kumar, (Indigo)

What is the timeline for increasing the ATM from 36 to 42 and then to 51?

GHIAL Response: The timeline for increasing the runway capacity from current 36 to 42 is around 18 months and it will be done gradually because there are safety procedures, air traffic control procedures, deign and many other things that need to be synchronized. Also, the airside expansion capacity should go in tandem with the infrastructure development.

Q#5 Mr. Dushyant Deep, (Indigo)

After the AUCC, will the new investment (5000+ cr investment for the 34 MPPA expansion) go to AERA for scrutiny or has it been already completed based on the L&B estimates?

GHIAL Response: Post completion of AUCC process necessary capital cost details will be submitted to AERA. The per sq mtr capital cost for 34 million capex is expected to be broadly in line with capital cost (excepting for the inflationary and tax impact) already considered by AERA for 20 million capacity . This was on the basis of Authority having appointed an independent consultant, RITES in 2017 to study the capital cost proposal of Hyderabad airport. The RITES carried out a detailed study and analysis of the estimated capital cost for expansion works and the recommendations of RITES was accepted by AERA in its second control period consultation paper. Since our present cost estimates for 34 MPPA is broadly in line with the estimated unit cost of RITES, we expect regulator's approval of the capital cost. .

Q#6 Mr. Dushyant Deep, (Indigo)

Will the new investment impact the CP2 tariff submissions which GHIAL already made to AERA?

GHIAL Response: Since most of the capex shall get capitalized towards the end of CP2 /early CP3, the proposed capital investment shall not have any major impact on the CP2 tariff.

Q#7 Laurence Jacobi, (Emirates)

Will the mentioned GSE tunnel be provided for ULDs moving with all dimensional cargo when freighter are parked on the passenger terminal?

GHIAL Response: We are expecting that most of the freighters will be parked in front of the cargo terminal. The tunnel planned under the taxiway side is for connecting the eastern apron with the domestic aircraft.

Q#8 Laurenz Jacobi, (Emirates)

As the main access road is expanding from 4 to 8, is GHIAL making any provision for dedicated truck access road as at present cargo trucks cover lot of space?

GHIAL Response: Along with the expansion of the main access road (MAR), GHIAL is also planning for a dedicated cargo road (as per the cargo master plan) which will take a deviation from the MAR.

Q#9 Ujjawal Dey, (FIA)

Where does airport stand with respect to mandating the ground handling regulation 2017? Do we have 3 ground handling agents already?

GHIAL Response: The 3rd ground handler will be on-boarded by the end of October along with the AAI airports in line with the latest directions issued by MoCA. Also, we will give them another 5-6 months to be ready to start the operation.

Q#10 Naozad Dastur, (Indigo)

Could you share the phase wise timeline for the terminal building or will it be completed in 1 phase only i.e. at the end of 4 year period?

GHAIL Response: There will be a phase wise release of capacity, however, that is expected to start post 24 months from the date of award. However, GHIAL has taken some interim measures to address the growth of both international and domestic passengers. Since majority of the congestion in passenger processing are experienced at pre-SHA area, the interim measure taken to decongest pre-SHA area through creation of an interim international departure terminal which shall shift the entire international departure operations, shall address both the domestic and international growth in coming 3 years.

The Stakeholders appreciated the management for the detailed presentation and the Q&A session.

Vote of Thanks:

Concluding the AUCC meeting, Mr. Kishore thanked all the stakeholders for attending the AUCC Meeting and endorsing the Expansion and Capex plans of GHIAL and informed that any further questions or suggestions can be sent through email and the same will be responded appropriately.

Meeting ended with vote of thanks by Ms. Shweta Saini followed by Lunch.

XXX

GHIAL AUCC MEETING – September 7, 2018						
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GHIAL AUCC MEETING – September 7, 2018

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GHIAL AUCC MEETING – September 7, 2018						
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GHIAL AUCC MEETING – September 7, 2018

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GHIAL AUCC MEETING – September 7, 2018						
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61.	Pradeep Panicker	Dy. CEO	GHIAL	9910382828		
62.	RAJESH AROM	CFO	GHIAL	9958895684		
63.	KBS SARMA	CLO	GHIAL	9701444556		
64.	P. Bhavani.	A M.	GHIAL	8008001673		
65.	SAK Kishore	CEO	GHIAL	9949999060		
66.	Manish Sinha	COO	GHIAL	8978055222		
67.	Shweta Saini	Manager	GHIAL	9701964442		
68.						
69.						
70.						

PROCEDURE FOLLOWED FOR APPOINTEMENT OF EPC (ENGINEERING PROCUREMENT AND CONSTRUCTION) CONTRACTOR FOR DEVELOPMENT AND CONSTRUCTION OF TERMINAL BUILDING EXPANSION AND AIRSIDE INFRASTURCTURE EXPANSION AT RAJIV GANDHI INTERNATIONAL AIRPORT, SHAMSHABHAD, HYDERABAD

Request for Qualification (RFQ) for EPC Hyderabad Expansion Works was published in the leading newspaper on 26th September 2017 to obtain expression of interest from interested applicants having prior experience in EPC of similar nature of works. (Refer Annexure-17)

In response to RFQ notification, RFQ submissions from 04 firms were received on 26th October 2017 as detailed below:

1. M/s. Larsen & Toubro Limited, India
2. M/s. Megawide Construction Corporation, Phillippines
3. M/s. Limak As, Turkey
4. M/s. Shapoorji Pallonji & Company Pvt Ltd., India

The RFQ's were opened on 01st Nov 2017 and all the submissions made by the applicants were scrutinized by the evaluation committee members. Based on the details furnished in the response to the RFQ, an evaluation was carried out to determine compliance with eligibility criteria as detailed in RFQ.

Based on the evaluation, the following Bidders were Pre-qualified to participate in the bidding:

1. M/s. Larsen & Toubro Limited, India
2. M/s. Megawide Construction Corportion, Phillippines
3. M/s. Limak As, Turkey

[The detailed evaluation report is attached as **Annexure – 18**]

Subsequent to Pre-qualification process, GHIAL had floated ITT (Invitation to Tenderer) bearing tender no. **GHIAL/EXP/EPC/2018/01** on **01st December 2017** to qualified bidders to participate in the Tender with deadline for submission of bid as **15th Jan 2018**. (Refer Annexure-19)

As per ITT, a Pre-bid meeting was conducted on **12th December 2017** with above qualified bidders and followed by site visit. An amendment (01) to the tender was issued to the bidders on **02nd January 2018**.

Post pre-bid meeting, bidders have raised 1026 queries in different phases on the Employer's Requirement and GHIAL have responded to the queries and made some amendments in the ER Drawings and Reports. Based on the above responses to the queries, bidders sought Extension of Time, the extension was granted up to 22nd march 2018.

In accordance with the RFQ requirement, following bidders had submitted their bids through Sealed Envelopes (Both Technical proposal & Price proposal) on **22nd March 2018.**

Sr.no	Name of Bidders	Bid Status
1	M/s. Larsen & Toubro Limited, India	Submitted
2	M/s. Megawide Construction Corporation, Phillippines	Submitted
3	M/s. Limak As, Turkey	Submitted

Technical proposal were opened on **24th March 2018** in the presence of Technical Committee. The Technical committee had examined the technical Proposal for completeness of submissions and found that the tenders were in order.

Committee recommended that all bidders were technically qualified as detailed below:

Sr	Qualification Criteria	NAME OF BIDDERS			
		Weightage	L&T	Megawide	Limak
	Technical rating	10.00	8.90	8.30	7.10
	Qualified		Yes	yes	Yes

Note - Details of Technical evaluation report is attached as **Annexure-20**

During the process of technical evaluation, the Committee noticed certain discrepancies in terms of understanding of Employer's Requirement. Hence, the Bidders were requested to provide Technical Presentation on scope of understanding of the Project.

The Technical presentation was made by the Bidders to the senior management of GMR and the Technical evaluation committee. Subsequent to Technical presentation from Bidders, the discrepancies/deviations noticed during technical presentation was clarified to the Bidders on **20th April 2018.** Further to the Technical Clarifications provided as stated above, Bidders raised queries on the same, seeking few additional clarifications and the same was further clarified on **25th April 2018**. There were various rounds of discussion and exchange of clarification on the Employer's requirement, all the clarification could be provided by 6th Jun'2018 and accordingly GHIAL had notified bidders to submit revised supplementary proposal by 13th June'2018.

On receipt of revised Supplementary Proposals, technical committee members reviewed Supplementary Proposal and recommended that proposals are in compliance with Employer's Requirement. As per directives of management, Price Proposals (Original and Supplementary) of EPC were opened on **04th July 2018** in the presence of Financial Committee.

Summary of first cut Pre-Negotiated Financial Comparative Statement is detailed as below:

Sr	Items	L&T	Megawide	Limak
1	Phase -1 Works			
1.1	Basic	2,445.99	2,660.85	3,348.26
1.2	Labour Cess	24.46	26.61	33.48
1.3	Taxes	440.28	478.95	608.71
1.4	Total Amount of Original Price Proposal for Phase 1 Works	2,910.73	3,166.42	3,990.46
1.5	Supplementary Price Proposal 1	36.62	47.07	-72.56
1.6	Supplementary Price Proposal 2	-36.62	3.46	-
1.7	Total incl Supplementary Proposals for Phase 1 Works	2,910.73	3,216.95	3,917.90
2	Phase - 2 Works			
2.1	Basic	1,031.53	1,090.39	1,232.88
2.2	Labour Cess	10.32	10.90	12.33
2.3	Taxes	185.68	196.27	224.14
2.4	Total Amount of Original Price Proposal for Phase 2 Works	1,227.52	1,297.56	1,469.35
2.5	Supplementary Price Proposal 1	15.02	-9.70	-
2.6	Supplementary Price Proposal 2	-1.02	-5.81	-
2.7	Total incl Supplementary Proposals for Phase 2 Works	1,241.52	1,282.06	1,469.35
	Total excl Provisional Sum	4,152.25	4,499.01	5,387.25
3	Provisional Sum	-	-	-
3.1	Total Incl all taxes, duties, cess	61.32	139.49	196.77
3.2	Supplementary Price Proposal 1	-	-2.95	-

3.3	Supplementary Price Proposal 2	-	-	-
3.4	Total incl Supplementary Proposals for Provisional Sum	61.32	136.54	196.77
4	Grand Total (1.7+2.7+3.4)	4,213.57	4,635.55	5,584.02

First round of negotiation was conducted on **11th July 2018** with L1 and L2 Bidder's. During negotiations with the bidders, various techno commercial points were discussed and clarification given. After negotiation, minutes of meeting was circulated to the bidders stating the clarification to the actual scope of Expansion Works wherever necessary and informed to submit the revised offers on or before **13th July 2018**.

Revised offers (R1) were received on **13th July 2018** and the comparative statement for revised offer (R1) is detailed below

1st round of Negotiated Financial Comparative Statement is provided below:

Sr	Items	L&T (R0)	L&T (R1)	Megawide (R0)	Megawide (R1)	Limak (R0)
1	**Phase -1 Works**					
1.1	Basic	2,445.99	2,453.46	2,660.85	2,574.54	3,348.26
1.2	Labour Cess	24.46	24.53	26.61	-	33.48
1.3	Taxes	440.28	446.04	478.95	463.42	608.71
1.4	**Total - Original Price Proposal for Phase 1 Works**	2,910.73	2,924.04	3,166.42	3,037.96	3,990.46
1.5	Supplementary Price Proposal 1	36.62	-	47.07	-	-72.56
1.6	Supplementary Price Proposal 2	-36.62	-	3.46	-	-
1.7	**Total incl Supplementary Proposals for Phase 1 Works**	**2,910.73**	**2,924.04**	**3,216.95**	**3,037.96**	**3,917.90**
2	**Phase -2 Works**					
2.1	Basic	1,031.53	1,034.92	1,090.39	1,021.92	1,232.88
2.2	Labour Cess	10.32	10.35	10.90	-	12.33
2.3	Taxes	185.68	188.15	196.27	183.95	224.14
2.4	**Total -Original Price Proposal for Phase 2 Works**	1,227.52	1,233.42	1,307.51	1,205.87	1,469.35
2.5	Supplementary Price Proposal 1	15.02	-	-9.70	-	-
2.6	Supplementary Price Proposal 2	-1.02	-	-5.81	-	-
2.7	**Total incl Supplementary Proposals for Phase 2 Works**	**1,241.52**	**1,233.42**	**1,282.06**	**1,205.87**	**1,469.35**
	Total excl Provisional Sum	**4,152.25**	**4,157.45**	**4,499.01**	**4,243.82**	**5,387.25**
3	**Provisional Sum**	-	-	-	-	-
3.1	**Total Incl all taxes, duties, cess**	61.32	61.32	139.49	136.54	196.77
3.2	Supplementary Price Proposal 1	-	-	-2.95		-
3.3	Supplementary Price Proposal 2	-	-	-		-
3.4	**Total incl Supplementary Proposals**	61.32	61.32	136.54	136.54	196.77
4	**Grand Total (1.7+2.7+3.4)**	**4,213.57**	**4,218.77**	**4,635.55**	**4,380.37**	**5,584.02**

Based on the revised offer (R1), L1 and L2 Bidders were invited for second round of commercial negotiation on **16th July 2018**

The comparative statement with revised offer (R1) was tabled to the financial committee members and Mr. IP Rao and Mr. SGK Kishore.

Based on the discussion, it was recommended to split the contract into two Packages viz., Package 1(Civil and Finishes, MEP, Elevators, Escalators/ Travellators, GSE Tunnel, Furniture and Signages) & Package 2 (Airport Systems comprising of Baggage Handling Systems, Security Systems, Passenger Boarding Bridges, GPUs,

PCAs and VDGS) that would yield substantial saving. Also separating major plant and machineries in to a standalone package would substantially help GHIAL in increasing the probability of obtaining GST input credit based on the advice from indirect tax team and consultants.

As recommended above, thorough negotiation was carried out with L1 and L2 Bidders who were instructed to submit revised proposal and optional proposal (split options) before **19.07.2018** as detailed below:

- Option -1 : Proposal with entire Scope of Works
- Option -2 : Proposal Excluding Airport Systems
- Option -3 : Proposal for Only Airport Systems

The revised offers (R2) were received on **18th July 2018.** The details of revised price proposal for spilt package are as mentioned below:

Sr	Description	L&T	Megawide
1	Original Proposal (Phase 1+Phase2)	✓	✓
2	Proposal Excluding Airport Systems (Phase 1+Phase2)	✓	✓
3	Proposal for only Airport Systems (Phase 1+Phase2)	Regretted	✓

Based on the revised price proposal (R2) for Split packages, the comparative statement was forwarded to the financial committee on **19th July 2018** for review and final recommendations.

Summary of Financial Comparative statement for Split Package are tabulated as below:

Sr No	Items	L&T	Megawide	L&T	Megawide	L&T	Megawide
		Option 1 (entire Package)		Option 2 (Excludes Airport system)		Option 3 (Only Airport system)	
1	Phase 1 Works	2,355.52	2,523.04	1,768.62	1,978.57	Regretted to Quote	591.51
2	Phase 2 Works	997.86	1,001.48	720.38	779.30		230.81
3	**Sub Total**	**3,353.38**	**3,524.52**	**2,489.00**	**2,757.87**		**822.32**
4	Taxes and Cess	643.17	634.43	477.39	528.96		157.72
5	**Total**	**3,996.55**	**4,158.95**	**2,966.39**	**3,286.83**		**980.04**
6	Provisional Sums (in tax)	61.32	138.32	61.32	138.32		NA
7	**Final Cost incl Provisional Sum**	**4,058.57**	**4,297.27**	**3,027.71**	**3,425.15**		**980.04**
	Rank	**L1**	L2	L1	L2		

Based on the above, it was agreed by the management to split the contract as per Option -2 which results in:

- Saving of Rs. 50.2 Crore
- Possibility of tax gains by way of input tax credit on Plant and Machineries.

Sr No	Considerations	Bidder	Final Contract Sum (INR in Cr)
1	Cost of L1 bidder (Option 1 – Full Package)	L&T	4058.57
2	Cost of Split contracts		
	a)Excluding Airport Systems (including provisional sum for election item)	L&T	3027.71
	b)Only Airport Systems	MW	980.04

3	**Total Cost of Contract Sum (2a +2b)**	**4007.75**
4	**Savings (1 - 3)**	**50.82**

Based on the above it was recommended to the management to award package 1 & Package 2 with the scope as below .

a) Package -1 (Phase 1 + Phase 2): Contractor – **M/s. Larsen and Toubro Limited**
Civil and Finishes, MEP, Elevators, Escalators/ Travellators, GSE Tunnel, Furniture and Signages

b) Package -2 (Phase 1 + Phase 2): Contractor – **M/s. Megawide Construction Corporation**
Airport Systems comprising of Baggage Handling Systems, Security Systems, Passenger Boarding Bridges, GPUs, PCAs and VDGS.

Final Cost:

Total Cost to Company and Budget approval required for the proposed Expansion Works are as detailed below:

Sr	Details of Particulars	Package -1 (Phase 1 + Phase 2)	Package-2 (Phase 1 + Phase2)
	Amount in INR (Crore)	(A) Larsen and Toubro Limited	(B) Megawide Construction Corporation
1	Basic value	2,489.00	822.32
2	**Sub Total**	**2,489.00**	**822.32**
3	Taxes and Cess	477.39	157.72
4	**Sub Total (include Cess & taxes)**	**2,966.39**	**980.04**
5	Provisional sum for election items (Include Taxes & Cess)	61.32	NA
6	**Sub Total (Including Provisional sum)**	**3,207.71**	**980.04**
7	**Grand Total (A + B)** (Inclusive of all applicable taxes, duties, charges, cess and all similar levies)	**4,007.75**	

Basis above Contract with M/s L&T for package-1 was signed on 19th October 2018. M/s Megawide requested for considering as below explaining the reasons :

1. Limiting the Megawide's scope to overseas design and supply of Package-2 equipment
2. Local design, local supply (within India), installation, testing & Commissioning of Package-2 works shall be performed by the Contractor appointed by GHIAL
3. Megawide would take ultimate responsibility for performance of all systems as per Employer's requirement
4. Megawide would also be responsible for all defect rectification and warrantees for the systems

The team of GHIAL has discussed on above arrangement with Megawide's representatives and after internal deliberations it has been agreed to

1. Sign a overseas Supply Contract with M/s Megawide
2. M/s Megawide would provide detailed design from their overseas office for supply and implementation of the Package-2 works.

3. GHIAL Will appoint a local Contractor for supply of local materials, local design, installation, testing and commissioning, trail operation and handing over.

The team was of the opinion that –

1. Splitting of Contract would not affect the performance of the systems as major scope of Package-2 works shall be import of equipment

2. M/s Megawide has guaranteed the performance of the systems and has assured they would take ultimate responsibility for performance of the systems

3. Previous arrangement was EPC (Works Contract) and chances of availing input tax credit are limited. With M/s Megawide scope limited to supply of Airport systems, GHIAL would be able to maximize the input tax credit for IGST components.

As per negotiation with M/s Megawide and L&T, the final contract sum based on the split of Package-2 works has been agreed as below:

Sl. No	Package	Contractor	Contract Sum	TAX	Total
1	Package-2 (Imported works) Design and supply of overseas components	M/s Megawide	741,56,09,926	133,48,09,787	875,04,19,713
2	Package-2 (Local works) Local design, local supply, installation, testing % commissioning	Local contractor to be appointed by GHIAL	88,98,43,954	16,01,71,912	105,00,15,866
	Total (Rs.)		830,54,53,880	149,49,81,699	980,04,35,579

Conclusion : Based on above analysis Management has felt that by splitting the order , we can save amount as well as tax implementation on project . Finally it was decided to award the contracts as below .

1. Package 1 –

   For all Civil & Finishes works as detailed above to M/s L&T for Rs 2966.39/- Cr .

2. Package 2-

   Design & Supply of Airport systems (Imported works) to M/s Megawide for Rs 875 /-Cr .

3. Package 3 –

   Local supply & Installation, Testing & Commissioning to Local contractors for Rs 105/- cr

Total	**Rs 3946.39 /-Cr**

By splitting the contracts as above it was beneficial to conclude the contracts for Rs **3946.39/-** cr as against lowest negotiated with L&T for full scope for **Rs 3996.55 cr /-**

HYDERABAD RAJIV GANDHI INTERNATIONAL AIRPORT

GMR Hyderabad International Airport Limited

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Letter No: GHIAL/ 2020-21/SPG/1497
Dated: 7th January 2021

The Director (P&S, Tariff)
Airports Economic Regularity Authority of India
AERA Building, Administrative Office
Safdarjung Airport
New Delhi 110003

Subject: Request for information for CP III MYTP for GMR Hyderabad International Airport for Capex study conducted by RITES.
Reference: Email dated 9th December'2020
Email dated 16th December'2020
Email dated 31st December'2020

Dear Sir,

This is with reference to the MYTP for third control period for RGIA Hyderabad submitted by us vide letter dtd. 23rd July'2020. The Authority has sought information vide email dtd. 9th December'2020 and 31st December'2020, regarding the proposed capital expenditure study conducted by M/s RITES. A part response to the data requirement was sent via email dtd. 16th December'2020, the response to remaining queries are as follows:

1. Request made by various Airlines for additional day and night parking:

Please find below the Airline wise night parking count for FY'21:

Airlines	Current Night Parking(Approved)	
	A320/B738	ATR/DH4
Air India & Alliance	3	4
Go Air	4	0
IndiGo	21	8
SpiceJet	6	8
TruJet	0	5
Vistara	1	0
Total	**35**	**25**
Total (A320/B738 + ATR/DH4)	**60**	

Further, based on input received from airlines following is the stand utilization demand (forecast) for the remaining period of the control period:

Corporate Office:
IBC Knowledge Park, Phase 2,
'D'Block, 10th Floor, 4/1,
Bannerghatta Road, Bangalore 560 029

Status (Demand Forecast)	Domestic Usage	International Usage	Total
Current (FY20-21)	60	13	73
FY21-22	65	15	80
FY22-23	71	16	87
FY23-24	76	17	93

2. **Draft Indian Standard Doc. CED 29(7906) WC dt. Oct.2013 (Guidelines for Construction Project Management Part 7 Procurement Management):** We are unable to locate the referred document. You may please provide further clarity on the requirement.

3. **Projected traffic forecasting report of ICF Ltd UK:** Please find attached the excel back up and the final report by ICF Ltd UK for traffic forecasting as Annexure-1 and Annexure-2 respectively.

4. **Master planning report worked out in consultation with Landrum & Brown:** The Master Planning report worked out in consultation with Landrun & Brown is saved at the FTP link under *"3. Master Plan, PTB & Airside Layout"* folder. The link and the credentials to open the link are follows:

   External link:
   ftp://61.95.188.11

   Credentials:
   User Name: GHIAL-CDO
   Password: Passw0rd@123

5. **Bill of Quantity of awarded cost and balance cost estimates** – The detailed price schedule of the awarded contracts (L&T, Megawide, VNC, MVR and Beumer India and others) and basis of estimates of balance work with details of BOQ is provided in excel format as desired (Annexure-3). The summary of the same is as below:

Particulars (Rs. Crs.)	**Awarded cost**	**To be Awarded**	**Remarks**
Expansion of the Terminal Building	2414.64	243.67	• Details of Rs.2343.42 Cr. of L&T Contract are attached in Schedule-A (Annexure 3). The Detailed Price schedule of L&T is attached separately (PDF Version, Annexure 3.1) • Details of Rs.71.22 Cr. is already submitted vide our email dated 31/12/2020 • Details of Rs. 243.68 Cr. are attached in Schedule-B (Annexure 3)
Airport Systems	1,029.03	40.96	• Details of Rs. 875.04 Cr (Megawide price schedule) is attached separately (Annexure 3.2) • Details of Rs.138.32 Cr (Price Schedule of Beumer India) is attached separately (to be adjusted for GST, Annexure 3.2) • Details of Rs.15.67 Cr. is already submitted vide our email dated 31/12/2020 • Details of Rs.40.97 Cr. are attached in Schedule-C (Annexure 3)
Expansion of the Kerb & Approach Ramp	150.91	5.50	• Details of Rs. 149.93 Cr (VNC Price schedule) is attached separately (Annexure 3.3)

			• Details of Rs.0.98 Cr. is already submitted vide our email dated 31/12/2020 • Details of Rs.5.49 Cr are attached in Schedule-D (Annexure 3)
Expansion of Apron and Taxiway	856.02	39.74	• Details of Rs.637.76 Cr. are attached in Schedule-A (Annexure 3). Detailed Price schedule of L&T is attached separately (Annexure 3.1) • Details of Rs. 143.59 Cr (MVR price schedule) is attached separately (Annexure 3.4) • Details of Rs. 56.24 Cr (VNC price schedule) is attached separately (Annexure 3.4) • Details of Rs.18.43 Cr. is already submitted vide our email dated 31/12/2020 • Details of Rs.39.74 Cr are attached in Schedule-E (Annexure 3)
Road Infrastructure	24.23	142.76	• Details of Rs.24.23 Cr. (VNC Price Schedule) is attached separately which is part of main road Infrastructure estimate of Rs.167 Cr. (Annexure 3.4) • Details of Rs. 167 Cr. estimate is attached as Schedule-F (Annexure 3)
GSE Tunnel	82.81	0.00	• Details of Rs.82.81 Cr. are attached in Schedule-A. (Annexure 3). • Detailed Price schedule of L&T is attached separately (Annexure 3.1)
Total	**4557.65**	**472.64**	

Yours Faithfully,

For **GMR Hyderabad International Airport Ltd.**

K Narayana Rao
Authorized Signatory

Annexure 4

		20 MAP (IT COST)		GHIAL EXPANSION - ESTIMATED IT COSTING		
S.No	**IT System**	**20 MAP (Rs. Crs)**	**Decription of Items included in 20 MAP**	**Overall Package Cost (In Cr)**	**Description of Items included in 34 MAP**	**34 MAP (Submitted to RITES - Rs. Crs)**
1	Structured cabling system	8.63	3300 data points	9.18	17000 data points	9.18
2	Active Network			34.50		
3	Wi-Fi	-	Wifi cost not provisioned under 20 MAP	5.22	Active infrastructure on account of 4G and 5G	0.06
4	IP Telephony	1.28	700 nos fo telephone connections	5.43	4200 nos	
5	CUPPS	19.19	70 nos - Cute; 20 nos- retro fitted SBD (in 34 MAP cost SBDs are forming part of Airport Systems); 27 nos CUTE Systems; 32 nos of CUSS Systems; 18 - E-Boarding Gates	8.85	62 nos.	
6	CUSS			6.17	50 nos.	
7	BRS			1.32	10 counters	
8	E-Boarding			53.27	126 lanes	
9	CCTV	7.61	471 nos of CCTV cameras; 26 nos of LCD screens for AOCC and SOCC	31.97	2968 cameras	20.32
10	ACS		65 nos ACS	12.04	494 ACS	12.04
11	FIDS	3.65	177 nos	12.81	526 nos	7.43
12	MATV	1.10	54 nos	2.75	131 nos	2.25
13	Video wall	2.45	3 nos	5.43	4 nos	
14	In-Building solution	1.25	1 /2" & 7/8" Copper cabling	16.99	Hybrid Active solution for 4G and 5G	
15	TETRA (TMRS)	1.80	60 nos	7.00	400 nos	1.06
16	PAS	1.58	70 nos of MA 12 speakers; 180 Nos of Ceiling Speakers and 26 Nos of Wall mount speakers	18.41	Distribuated IP based PA system with larger footprint with Speakers MA 12 – 140 nos, MSA 12 – 147 nos, Ceiling – 1690 nos and Wall Mount – 65 nos	10.78
17	Master Clock	0.34	40 nos	0.70	2 nos+40 nos	
18	Immigration Displays & P-Gates	-	Not provisioned under 20 MAP	2.07	diplay 48 , P Gates 76 gates	
19	Feed Back kiosk			4.82	105 nos	
20	Wayfinding Kiosk			0.83	4 nos	
21	NPCR			6.38	Construction of primary communication room- New Provision (was not in 20 MAP)	4.73
22	Design consultancy works for SCS			0.76	Design Consultancy	
23	Rerouting of OFC cables			0.47	Laying of optical cabiling works in ATC area	0.37
24	Others					1.05
Total		**48.88**		**247.38**		**69.28**