



PRE-FEASIBILITY REPORT

ON

THE PROPOSED EXTENSION AND STRENGTHENING OF RUNWAY
AT
TIRUPATI AIRPORT



Submitted by



AIRPORTS AUTHORITY OF INDIA

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1.0 INTRODUCTION & PROJECT BACKGROUND

Tirupati International Airport, (IATA: TIR, ICAO: VOTP) is a public international airport located at Renigunta, a suburb of Tirupati in the state of Andhra Pradesh. The airport is located 14 km away from Tirupati and 40 km from Venkateswara Temple, Tirumala. Central Government has approved the proposal to make Tirupati airport as an International Airport. To meet the demands of International traffic and International Chartered flights, the existing runway is proposed to be extended by 1524 m to make it 3810 m, suitable for Code-'E' type of aircrafts.

• Project Background

Tirupati airport was commissioned and constructed in the year 1971. Tirupati airport is a public international airport suitable for operation of AB-320 type of aircraft in all weather conditions. The existing Runway 08/26 of dimension 2286 x 45 m is suitable for operation of AB-320 type of aircraft. A new Integrated Terminal building with a peak hour of 700 passengers (200-International and 500-Domestic) was commissioned in Nov'2016. An old Apron is suitable for parking of 3 Code 'C' type of aircraft and a new Apron is suitable for parking 2 Code 'D' type of aircraft and one Code 'C' type of aircraft the new Apron is being expanded by adding 4 of additional bays for parking AB-320/AB-321 type of aircraft as night parking facilities.

The airport covers an area of 339.56 acres and AAI projected additional 733.15 acres of land to State government out of which 702.27 acres of land has already been handed over to AAI. Balance area of 30.88 acres is yet to be handed over to AAI, Tirupati. Extension of Runway for Code-E category of aircraft can be taken up only after the balance, 30 acres of land is handed over by State Government.

1.1 Project Proponent

Airports Authority of India (AAI) was constituted by an Act of Parliament and came into being on 1st April 1995. AAI manages 125 airports, which include 18 International Airport, 07 customs airports, 78 Domestic airports and 26 civil enclaves at defense airfields.

AAI provides air navigation services over 2.8 million square nautical miles of air space. During the year 2013-14, AAI handled aircraft movement of 1536.60 thousand [international 335.95 & domestic 1200.65], passengers handled 168.91 million [international 46.62 & domestic 122.29] and the cargo handled 2279.14 thousand MT [international 1443.04 & domestic 836.10].

1.2 Need for the Project

Tirupati is famous for Tirumala Venkateswara Temple located in the hill town of Tirumala in the Chittoor district of Andhra Pradesh, India. The temple attracts scores of pilgrims round the year both national and international and is visited by about 100,000 to 200,000 pilgrims daily, while on special occasions and festivals, like the annual Brahmotsavam, the number of pilgrims' shoots up to 500,000. Consequent to the Andhra Pradesh State Re-organization Act, 2014 mandated the Government of India to develop Tirupati airport as per the International Standards.



Tirupati airport is a domestic airport suitable for operation of AB-320 type of aircraft in all weather conditions. The existing Runway 08/26 of dimension 2286X45m is suitable for operation of AB-320 type of aircraft. A new Integrated Terminal building with a peak hour of 700 passengers (200-International and 500-Domestic) was commissioned in Nov'2016. The old apron is suitable for parking of 3 Code 'C' type of aircraft and the new apron is suitable for parking 2 Code 'D' type of aircraft and 01 Code 'C' type of aircraft. The new Apron is being expanded by adding 4 additional bays for parking AB-320/AB-321 type of aircraft as night parking facilities.

To meet the growing demands of the traffic and to facilitate Code-E type of aircraft at Tirupati airport, the existing runway and the allied facilities are proposed for expansion.

The year wise passenger report for the last two years is given in **Table-1**.

TABLE-1
STATISTICS (APRIL 2016 – MARCH 2017)

Sr.No	Non Credit	Grand Total
1	Passenger movements	4,86,029 (31.0%)
2	Aircraft movements	6,612 (25.6 %)

Source: AAI

2.0 PROJECT DESCRIPTION

2.1 Type of Project

The proposed project involves extension of runway and expansion of associated units to cater to the operations of Code-E type of aircraft. This project falls under 'Category A' under physical infrastructure projects with activity type number 7 (a) as per EIA notification, 2006.

2.2 Location

Tirupati airport is located at Vikruthamala, Kothapalem & Kurakaluva villages of Yerpedu and Renugunta mandals, Chittoor district, Andhra Pradesh. It is at a distance of about 14 km from Tirupati city. The project site is located at an elevation of about 103-m above MSL at Airport Reference Point. The area is covered by Survey of India Toposheet No. 57 O/6 & O/10. The 10 km radius study area map and the google imagery are given in **Figure-1** and **Figure-2** respectively.

2.3 Details of Alternate Site

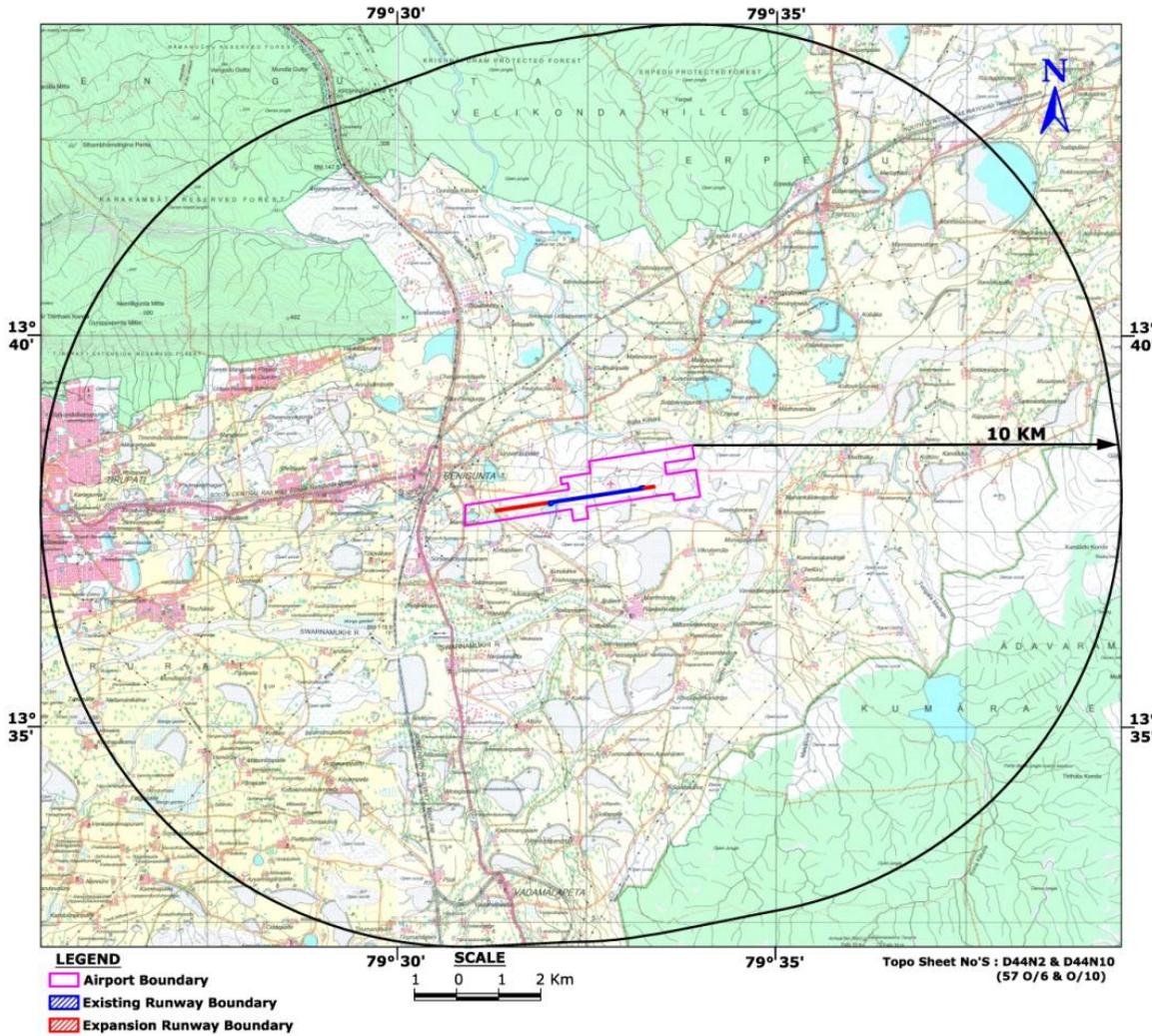
The proposed project involves extension of existing runway to cater to the operations of code E aircraft. The extension will be done in the land abutting the existing airport. Hence, no alternative sites were examined.



2.4 Existing Project Features

Existing facilities includes:

Sr. No	Particulars	Details
1	Runway	
	Orientation	08 - 26
	Dimension	2286 m x 45 m
	Existing Apron -I	152.5 m x 145 m
	Existing Apron -II	152.5 m x 145 m
	Apron after Extension under implementation	
2	Garuda Terminal Building	
	Plinth Area	16,500 m ² (1,78,000 square ft)
	Pax Capacity	500 domestic and 200 international passengers at peak hour
	VIP Room	Available
	Car Parking	170 lots
3	Runway Light Facilities	Available
4	Approach Lights	
	Runway 08	Available
	Runway 26	Available
5	Navigation Aids	
	DVOR	116.2 mhz
	DME	1196/1133 mhz
	NDB	393 khz
6	Landing Aids Visual & Instrumental	
	Runway 08	PAPI 08
	Runway 26	PAPI 26
7	Residential Colony	Available



Not to be used for EXPORT

OPEN SERIES MAP

No. D44N10
Scale 1:50,000

D44N5 (57O/5)	D44N9 (57O/9)	D44N13 (57O/13)
D44N6 (57O/6)	D44N10 (57O/10)	D44N14 (57O/14)
D44N7 (57O/7)	D44N11 (57O/11)	D44N15 (57O/15)

सर्वेक्षण विभाग भारत SURVEY OF INDIA
1st Edition 2011 Price: Rs. 75/-

CONVENTIONAL SYMBOLS

Various symbols for roads, railways, water bodies, and other geographical features.

FIGURE-1
STUDY AREA MAP

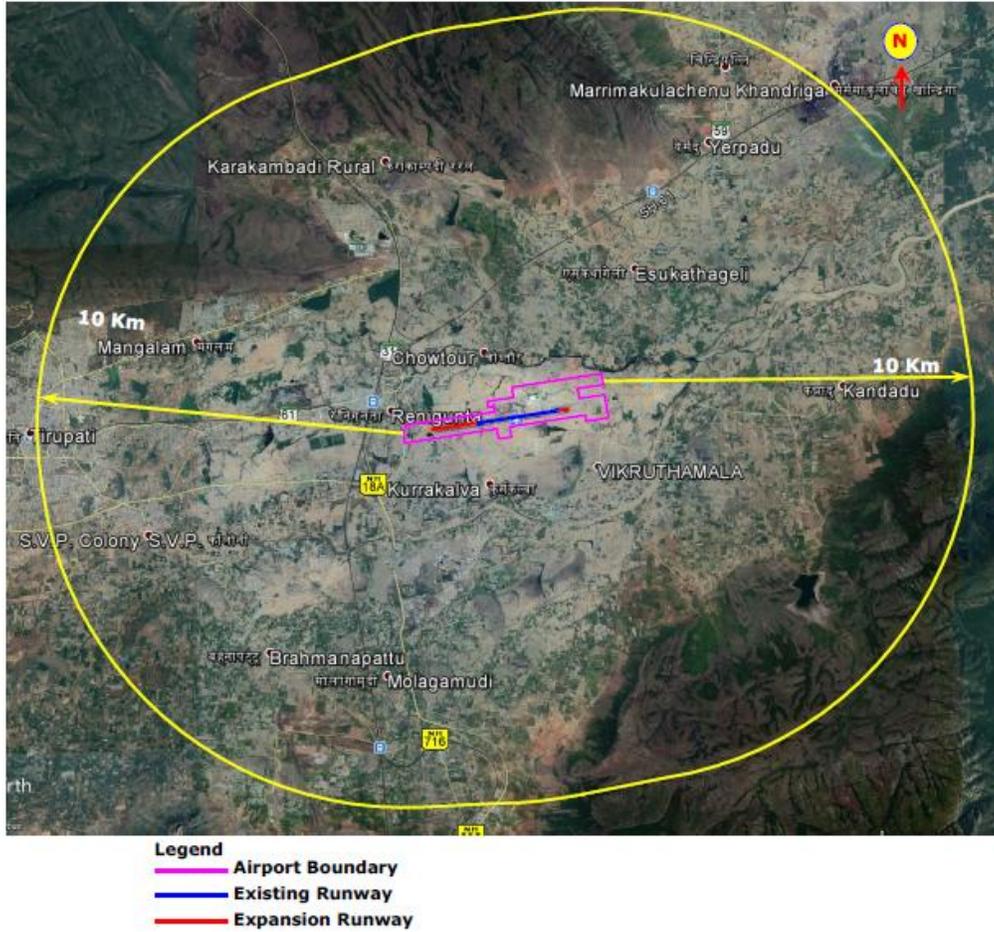


FIGURE-2
GOOGLE IMAGERY



2.5 Proposed Facilities

The proposed expansion project is to extend and strengthen the existing runway and allied facilities to cater to Code E aircrafts. Code E type aircrafts wing span ranges from 65 m to <80 m and outer main landing gear width ranges from 9 m to <14 m and is categorized as "Heavy transport vehicle".

2.5.1 Extension of Runway and Strengthening and Resurfacing of Existing Runway

- Extension of runway towards runway 26 by 240 m and extension of runway by 1284 m from 2286 m to 3810 m suitable to cater for B-747-400, B-777-300 ER type of aircraft;
- Provision of turn pad at both ends of runway with suitable strength for B-747-400, B-777-300 ER type of aircraft;
- Strengthening of existing runway;
- Provision of 7.5 m wide shoulders on both side of runway in shoulder strength in the extended portion suitable for B-747-400, B-777-300 ER type of aircraft;
- Provision of runway markings as per The Directorate General of Civil Aviation (DGCA) Civil Aviation Requirements (CAR) and Aerodrome Design Manual Part-IV (Visual Aids);
- Technical Evaluation & declaration of pavement strength after the completion of work and prior to commissioning;
- Storm-water Drainage and Rain-harvesting works in Operational Area.
- Grading of the 300m Basic strip area as per DGCA.
- The slopes on the runway, taxiway and RESA etc. as prescribed in DGCA CAR.
- OLS survey shall be undertaken before the commencement of the work to identify and eliminate any obstacles falling in the approach path such as high mast towers etc.

2.5.2 Pavement against Blast Erosion

A strip of size 60 m x 60 m to be constructed to protect against blast erosion in shoulder strength at runway ends.

2.5.3 Isolation Bay

- i) The isolation bay to be expanded from 91 m x 76 m to 120 m x 110 m as indicated in the Master Plan for code-E type of aircraft;
- ii) Existing isolation bay to be strengthened for Code 'E' type of aircraft;



- iii) Provision of adequate fillets at the intersection of runway with proposed taxiway leading to isolation bay; and
- iv) The critical aircraft to be considered for fillet design shall be B-747-400, B-777-300 ER aircraft

2.5.4 Apron

- i) The existing apron and apron under construction in front of New International Terminal Building (NITB) along with taxi way to be strengthened for Code 'E' type of aircraft with the Shoulders.
- ii) Work of installation of Visual Guidance Docking System (VGDS) for Remote bays to be taken up in case not provided.

2.5.5 Runway End Safety Area

- i) Provision of Runway End Safety Area (RESA) of dimensions 240 m x 90 m after the proposed extension and pavement against blast erosion at both ends of Runway.
- ii) Filling to be maintained in the approach area to maintain permissible gradient.

2.5.6 Electrical Works

- i) Relocation of SAPL on Runway 08.
- ii) Provision of 950 m for relocation of Cat-I approach light system on approach runway 26
- iii) Provision of runway & turn pad edge lights in the extended portion, relocation of runway-26 threshold lights, taxiway & isolation bay edge lights
- iv) Relocation of Precision Approach Path Indicator (PAPI) for runway-26 and approach runway 08 and provision of aeronautical ground lighting facilities and raising of the existing runway-edge lights with CI Collar.
- v) Provision of mandatory instruction signs and other illuminated information signs
- vi) Rerouting of any electrical or communication cables in the areas of proposed extension.
- vii) Extension/Provision of existing Power supply cables for various NAV-AIDS.
- viii) Relocation of wind direction indicators.
- ix) Provision of air-conditioning to Instrument Landing System (ILS) huts and Doppler Very High Frequency Omni-Directional Range (DVOR) in view of relocation
- x) Electrification of security watch towers.



2.5.7 Miscellaneous Works

- i) Construction of perimeter road of 305 m width with electrification, all along the perimeter boundary wall inside operational area
- ii) Construction of security watch towers as per Bureau of Civil Aviation Security of India (BCAS) norms.
- iii) Civil works related to the relocation of existing localizer, glide path and other NAV-AIDS.
- iv) Emergency access roads on both approaches to runway from crash gate.

2.6 **Water & Power Requirements**

Water Requirement

Total water consumption in the operating airport is about 280 KLD. Water requirement for the proposed project is estimated to be around 100 to 150 KLD and is sourced from Municipal water supply and borewells.

Power Requirement

Current peak demand is about 1150 KVA which is being met from the sanctioned contract demand of 1200 KVA from Andhra Pradesh State Electricity Board. Additional 530 KVA is required for the present proposal.

Standby DG Sets

Existing: 3 x 750 KVA; Proposed: Not required.

Generation of 1MW Solar Power work awarded recently by Renewable Energy Service Company (RESCO) model.

2.7 **Wastewater Generation & Management**

As part of the proposed extension of runway, no additional wastewater will be generated.

2.8 **Solid Waste Management**

Solid waste generated from the airport mainly comprises of food waste and garbage waste. Further, small quantities of sludge from STP, medical waste and other waste is being generated. Collection and handling of domestic solid waste is being done in line with the provisions of the Municipal Solid Waste Rules 2016.



3 SITE ANALYSIS

3.1 Connectivity

Tirupati airport is only 2.8 km away from National Highway 71 (Previously NH-205). This highway connects Tirupati with Bangalore and Coastal Andhra Pradesh.

3.2 Land Form, Land Use & Land Ownership

The airport covers an area of 605 acres and AAI projected additional 733.15 acres of land to State government out of which 702.27 acres of land has already been handed over to AAI. Remaining 30.88 acres of land allotment has to be given by the State Government.

3.3 Topography

The topography of the project site is covered with civil structures, open land and greenbelt. There will be minor change in the topography of the airport area due to the proposed expansion activities.

3.4 Existing Land use Pattern

The land use pattern of the existing airport remains same. The additional land will be converted into industrial/commercial land use.

3.5 Existing Infrastructure

Existing infrastructure details are given in Section-2.4.

3.6 Social Infrastructure Available

The existing social infrastructure at Tirupati which is located at about 14.0 km from the airport are:

- Hospitals;
- Banks;
- Post office;
- Bus station;
- Fire station;
- Secondary school;
- Police station;
- Shopping complex;
- Sports infrastructure (stadium & camps etc);
- Community halls;
- Cinema halls; and
- Primary health care centres.



4 PROPOSED INFRASTRUCTURE

The proposed project involves extension of runway to cater to the operations of code E aircraft. The details are discussed in Section-2.4.

5 REHABILITATION & RESETTLEMENT

Rehabilitation & resettlement is not involved in the proposed expansion project. The land will be given by Government of Andhra Pradesh.

6 PROJECT SCHEDULE & PRELIMINARY COST ESTIMATES

Proposed expansion will be completed in 12-24 months after obtaining all the statutory clearances. Preliminary estimated cost of work for the proposed expansion project is worked out to be Rs. 177.10 Crores.

7.0 ANALYSIS OF PROPOSAL

The present proposal of extension of runway will help meet the growing demands of the traffic and to facilitate bigger aircrafts operation in the airport.