

Risk Analysis and Mitigation in BOT Project

Maniyar Javeed Basha¹, B. Harish Naik²

PG Student (Construction Planning and Management), Department of Civil Engineering, Shri Shirdi Sai Institute of Science and Engineering, Anantapurmu, Andhra Pradesh, India¹

Assistant professor, Head of the Department of Civil Engineering, Shri Shirdi Sai Institute of Science and Engineering, Anantapurmu, Andhra Pradesh, India.²

ABSTRACT: Presently a days Risk administration has turned into an essential element in development businesses. This paper speaks to the different sorts of danger that happens in BOT(Build Operate Transfer) venture. Also, the methodology to beat the danger that are distinguished in the venture. In this paper a national expressway 9 is taken which is under BOT venture, which begins from vijayawada going through Hyderabad and finishes at pune. A contextual investigation on that street close patancheru in Hyderabad with a length of 96Kms with 2 toll square is taken. Also, the different danger which are influencing the venture and the techniques utilized for the task are broke down in this paper.

I. INTRODUCTION

India is moving towards a marvelous development story with monetary change unleashing venture and development and offering its residents awesome open doors. Despite the fact that the Indian economy has been versatile in this way, the key issue that it appearances is the way to manage this force.

The enduring usage of task danger administration in India can best be confirm by the development venture method that has been being used for more than 4 decades in India. The plausibility study was formally brought into the methodology in 1992. A capital venture (counting base activities) must take after the methodology .When an association has distinguished its requirement for another office, it must present an undertaking proposition characterizing the reason, prerequisites and general parts of the task, for example, area, execution criteria, scope, format, gear, administrations and different necessities.

The undertaking proposition of a medium or extensive estimated venture must be submitted to the offices in control for survey and remarks. The need tasks are liable to survey and endorsement by the State Council.

II. ABOUT THE PROJECT

Introduction: A detailed overview of the topic with the history and background of risk management in BOT projects.

BOT Approach and Risk: The process of how a BOT project takes on and the primary risk principles have been elaborated in this chapter

Risks in BOT Projects: Here in this topic research on various types of risks in BOT projects are analyzed and explained on NH-9 near patancheru Hyderabad for a length of 96Kms

Risk management of BOT projects: In this chapter we shall discuss how to overcome the risk , identifying and action for the risk.

Risk Analysis for Tolled Road Projects: A case study for a BOT project on a road project has been picked and analyzed the risks and their mitigation.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 9, September 2016

III. METHODOLOGY

For my theory, we have attempted to recognize a task having high hazard affect in order to exhibit the vitality of having a careful danger appraisal and alleviation methodology for any venture. The Road Project has been taken as it satisfies our criteria of having a high effect and in the meantime would display the possibility to profit by better hazard ID and alleviation. Despite the fact that dangers would be secured under twelve distinctive heads,

this proposal will concentrate on the budgetary dangers. With the aim of detailing a comprehensive rundown of territories for danger recognizable proof, we have composed our exploration technique with a two dimensional methodology that would approach the venture from both hypothetical and down to earth points of view and afterward land at a last rundown of dangers included for the street venture. The proposition would at last end with the focus on the dangers and our discoveries and recommendations for the same.

Analysis of a BOT Road Project

- Name of client** - Executive Engineer, P.W.D.
- Name of the Company** - M/S Jaypee DC Projects
- Type of contract** - B.O.T.
- National highway** - NH-9(near patancheru, Hyderabad)
- Length** - 96 Kms
- Estimated cost of project** - 750.00 lacs. **General Data**
- Construction of major Bridge across River near with By Pass road outside city under BOT**
- Date of work order** - 23/03/1999
- Duration of project** - 2 years
- Concession period** - 16.25 years.
- Length of service Road** - One side Approach - 2592 m.
Other side Approach = 930 m.
Bridge length = 148.00 m.
- No. of lanes** - 2
- No. of Toll plaza** - 2

Concession Agreement & Toll Collection Details

Sr. No.	Description	Details	Remarks
A. Concession Agreement Details			
1	Project Cost	Rs. 7.50 Crores	--
2	<input type="checkbox"/> Cost of Repairs and Renewal	Rs. 5.85 Crores	--
	<input type="checkbox"/> Administrative , Establishment & Toll Collection Charges	Rs. 12.27 Crores	--
	<input type="checkbox"/> Land Acquisition, Utility Services and Miscellaneous Expenses	--	Not Considered Separately
	<input type="checkbox"/> Inflation Amount	--	Not Considered Separately
	<input type="checkbox"/> Cumulative amount of Interest on Bank/Financial Institute Loan	Rs. 21.35 Crores	--
3	Project Life Cycle Cost (Sr. No. 1 + Sr. No. 2)	Rs. 46.97 Crores	--
4	Internal Rate of Return (I.R.R.) %	10.68 %	--
5	Concession Period	16 Years 3 Months 0 Days	--
6	Concessionaire's Equity	Rs. 1.87 Crores	--

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 9, September 2016

7	Returns on Equity	Rs. 22.00 Crores	--
8	Anticipated Toll Fee	Rs. 68.97 Crores	--
9	Toll Fee Collection Period (From 25-Oct-2000)	14 Years 7 Months 28 Days	--
10	Lender Banks/Financial Institutions	State Bank of India	--
B. Toll Fee Collection Details			
11	Toll Fee Collected		
	Toll Plaza Name	Toll Fee Collection on Date	Toll Fee Collection
	Toll Plaza 1	15-Jun-2012	Rs. 0.01038 Crores
	Toll Plaza 2	15-Jun-2012	Rs. 0.00125 Crores
	Toll Plaza 3	15-Jun-2012	Rs. 0.00004 Crores
	Total		Rs.0.01167 Crores
12	Cumulative Toll Fee Collected till Date 15-Jun-2012	Rs. 29.37 Crores	--

Note : The above figures (Cost / Period etc.) may change subject to variation in Scope of the Project and or additional works in the Project, and change in Lending Rate / PLR and or as stipulated in the Tender Conditions if any.

Different Risks Faced By Contractor:

Technical Risk:

In this anticipate there was no procurement of additional work of giving 230 mm dia hume funnel for phone link. The organization has finished the work according to earlier consent and laid a 142.75 r.mt. Of 230 mm dia RCC Hume channel and 174 Nos. of steel addition plates in R.C.C. parapets alongside full welding. The organization had spent a sum roughly equivalent to Rs. 48000/ - .

Risk because of progress in extent of the work - . The additional earthwork of 18278.94 m³ with all leads and lifts, with compaction included the expense of development Rs. 3,976,583.40 according to rate cited (Rs. 217.65/cm). The sum included is inside the extent of the work subsequently this kind of danger can be evaded by point by point overview and study the extent of the work, then just accommodation of archive. Above specialized danger can't be overcome by cases.

Power majeure Risk (Act of god): According to important contract procurement peruses as "If whenever amid the execution/consummation of the venture the business person is not ready to continue with building/finishing of the task past a time of one month because of any reason outside his ability to control, for example, fire, earth tremor, surges, storm, or whatever other such disaster, riots, common confusion the Govt.

IV. CONCLUSION

As a conclusion, hazard investigation and moderation is an imperative procedure fundamental with a specific end goal to accomplish a fruitful task financing .The contextual analysis portrays the venture foundation, the undertaking contractual worker, the financing of the undertaking, the danger included in every stage; the technique used to restrain the dangers, the issues experienced the present status of the activities, and additionally a general evaluation of the achievement or disappointment of the venture.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 9, September 2016

RISK CATEGORY	PHASE OF PREDOMINANCE	RISK IDENTIFICATION	RISK MITIGATION
Land Acquisition	Project Development	Delays in area obtaining and in giving hampered right of path to the EPC temporary worker can prompt deferrals in the begin of development bringing about acceleration of undertaking expense	a) Timely provision of land for construction of facilities and systems should be made a condition precedent to the lease/concession Agreement.
Project Completion Risk	Construction Period	The task fruition hazard or the temporary worker's danger alludes to the likelihood of non-finish of the task with the assigned period from the Notice to Proceed.	This danger ought to be moderated through a Procurement under Concession Contract (CC) CC with EPC contractual worker to incorporate turnkey, settled value outline and development contract with installments made on achieving certain breakthroughs
Technology Risk	Construction/ Operation period	This relates to the danger that the task might be either physically unseemly to handle the anticipated request or is improperly intended to meet nearby financial needs and subsequently amendment of these outline could heighten the O&M costs amid the operations period	the undertaking to be composed after an exhaustive examination of the nearby conditions the development ought to be completed with strict punishments for rebelliousness of the specialized configuration by the temporary worker
Operations and Maintenance risk	Operation period	In the occasion of O&M costs surpassing the evaluations utilized for the foundation of monetary suitability, lingering money streams for obligation/value administrations would be lower than foreseen there by influencing venture returns.	Determination of O&M administrator will be on the premise of aggressive offering the choice criteria ought to make into note of its past record, trustee obligation showed in other task, monetary quality and so on.
Financial Risk			
Interest Rate Risk	Operations Period	Determination of undertaking feasibility is predicated on the current financing cost situation winning in the	The task ought to be financed on an ideal blend of altered rate and drifting rate instruments, to support the loan cost development hazard
Force Majeure	Throughout project cycle	This danger classification manages nonpolitical occasions of power majeure considered as —Acts of god —such as scourges, characteristic calamity, quake, surges amid development stage influencing development and such different occasions.	Far reaching protection scope In power majeure dangers of sorts which are not insurable, the financial specialists ought to get yield of certain rate on value on date of end

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 9, September 2016

REFERENCES

1. Thomas, Satyanarayna N. Kalidindi and L. S. Ganesh. "Modelling and assessment of critical risks in BOT road Projects. Construction Management and Economics (April 2006) 24, 407-424.
2. Ahmad Kreydieh. "Risk Management in BOT Project financing". M. S. Thesis in Civil Engg., American University of Beirut, Lebanon.
3. Bedford, T., and Cooke, R. (2001). "Probabilistic Risk Analysis-Foundations and Methods". Cambridge University Press, Cambridge.
4. Sanjay Aggarwal, Dy. CMM/NR/NDLS. "Project Report on Delhi-Gurgoan Toll Road", 14 June 2013.
5. Kalidindi S.N. and Thomas A.V. (2002). "Identification of critical risks in Indian road projects through Build, Operate and Transfer (BOT) procurement approach". Proceedings of Symposium on Procurement Systems (CIB W92), Trinidad and Tobago, January, pp. 339-54.
6. "Roads and highways: toll roads." Online: World Bank http://www.worldbank.org/html/tpd/transport/roads/toll_rds.htm
7. Caltrans, 2002, —Caltrans Project Management Handbook, Caltrans Office of Project Management Process Improvement.
8. Cooper D., Grey S., Raymond G., Walker P., 2005, —Project Risk Management Guidelines – Managing Risk in Large Projects and Complex Procurements, John Wile and Sons ltd. Publication.