

Risk Analysis and Mitigation of Bot Projects

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Abstract: The growth of the infrastructure sector in India has been relatively slow compared with the industrial and manufacturing sectors. The energy shortage, an inadequate transportation network, and an insufficient water supply system have caused a bottleneck in the country's economic growth. The Build-Operate-Transfer (BOT) scheme is now becoming one of the prevailing ways for infrastructure development in India to meet the needs of India's future economic growth and development. There are tremendous opportunities for foreign investors. However, undertaking infrastructure business in India involves many risks and problems that are due mainly to differences in legal systems, market conditions and culture. It is crucial for foreign investors to identify and manage the critical risks associated with investments in India's BOT infrastructure projects. Based on the survey, the following critical risks are identified: delay in approval, change in law, cost overrun, dispatch constraint, land acquisition and compensation, enforceability of contracts, construction schedule, financial closing, tariff adjustment, and environmental risk. The measures for mitigating each of these risks are also discussed. Finally a risk management framework for India's BOT infrastructure projects is developed. Main purpose of this study is to investigate critical risks associated with Build Operate Transfer projects in India.

Keywords: Risk management, BOT, Infrastructure projects, Mitigating measures, equity risks.

1. Introduction

India is moving towards a remarkable development story with financial change releasing speculation and development and offering its residents awesome open doors. Despite the fact that the Indian economy has been versatile up until this point, the key issue that it faces is the manner by which to support this energy. A turnaround of urban communities to discharge their dynamism will be basic to the sustenance of India's future monetary development. Indian economy, so as to keep up and increase its monetary development needs to depend on urbanization. The urbanization that is occurring so far in the urban communities is in the natural frame as opposed to in an arranged way. So with a specific end goal to accommodate adequate expectations for everyday comforts a specific nature of foundation administrations must be accommodated in the urban areas.

The durable usage of venture Risk administration in India can best be prove by the development extend methodology that has been being used for more than 4 decades in India. The practicality contemplate was formally brought into the technique in 1992. A capital venture (counting framework

ventures) must take after the strategy .When an association has recognized its requirement for another office, it must present a venture proposition characterizing the reason, necessities and general parts of the venture, for example, area, execution criteria, scope, format, hardware, administrations and different prerequisites. The definition and arranging of the venture might be done as a team with offices in control, for example, common, civil, self-ruling area governments, focal services or commissions. The venture recommendations of a medium or expansive measured venture must be submitted to the offices in control for survey and remarks. The need ventures are liable to audit and endorsement by the State Council.

A. Objectives

Construct, Operate and Transfer (BOT) is an approach the private part uses to acquire a conceded concession for finishing a particular venture freely. Be that as it may, the responsibility for extend must be come back to people in general division once it is totally finished. To complete a BOT extend, the two divisions go out on a limb sharing from each other. For general society part, it is now realized that its inborn Risks in money related, mechanical and in addition administrative issues have been extraordinarily diminished. For the private division, by differentiate, what is known is the greatness of concession contract transaction and what is obscure is the basic Risk among numerous unverifiable components. The issues identified with the Risks for the BOT extend, be that as it may, in any case stay hazy. In this way, this examination tries to distinguish what the Risks are and evaluate those the private area confronts in holding a BOT extend. Risk evaluation prevails the achievement in venture and get that Risk appraisal fills in as a huge motivating force in managing designing contracts additionally demonstrated its significance in offering action and contract arrangement for the BOT ventures. Risk investigation examines in the present writing can be grouped into two general classes, to be specific subjective and quantitative analysis. To distinguish the different sorts of Risk will happen in BOT extends and to propose different alleviation measures to decrease the Risks in BOT ventures.

2. Literature review

Rasheed A Salawua, Fadhlin Abdullah (2014)Assessing Risk administration capacity (RMC) of temporary workers preceding their determination RMC for a venture would contribute

fundamentally to extend fruitful conveyance. This paper surveyed current RMC of Federal expressway ventures temporary workers in Nigeria. The examination includes audit of literary works and poll review of eighteen recovery extends crosswise over Southwest of Nigeria. Brain M. Kleiner, Thomas H. Mills (2015) Safety administration in development is a necessary exertion and its prosperity requires contributions from all partners crosswise over plan and development stages. Powerful Risk alleviation depends on the concordance of all partners' Risk discernments. Numerous scientists have seen the conflict of Risk observations among basic partners in safe development work, however few have given quantifiable proof depicting them. Zheng Qizhen(2009) With the fast improvement of monetary and innovation in China, auxiliary structures are winding up increasingly confused, which requires more thorough development innovation and development administration. Be that as it may, the Risk administration in our nation is still in its earliest stages, and administrators are shy of attention to Risks and absence of capacity to oversee Risks. Concentrate.

3. BOT approach and risk management

A. BOT Approach

To take care of the developing demand for open administrations, numerous nations have embraced private-open associations for the improvement of open foundation. A prominent approach is to utilize a construct work exchange (BOT) extend conveyance technique for the required framework. Under the BOT approach, the venture support is in charge of financing, outlining, and developing the venture and working it for a specific concession period. Amid the concession time frame, the venture support gathers incomes from working the venture to reimburse the venture costs and in addition to give a benefit. Toward the finish of the concession time frame, responsibility for finished venture is exchanged to the host government.

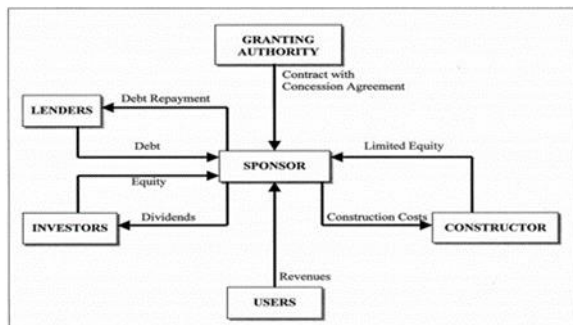


Fig. 1. BOT approach

Venture members incorporate the conceding expert, which normally is an administration organization; the venture support; and at least one money related foundations. The allowing specialist recognizes extend necessities, sets up the concession time frame, requests tenders, and honors the agreement. The

venture support regularly is a consortium or joint wander of building, development, and funding firms, and may incorporate value financial specialists, for example, the host government or institutional speculators. Venture capital may originate from business banks, insurance agencies, or the offer of bonds. The connections among the venture members are appeared in Figure The constructor ordinarily contributes value amid the early stages on the venture, yet regularly offers its position upon the finishing of development. At the end of the concession period, all operating rights and operational responsibilities revert to the granting authority.

B. Risks in Bot projects

Types of risks in BOT project. These Risks can be classified as take after:

- Money related Risks - cash Risks, web rate chance, value chance, outside trade Risk, business chance, liquidity chance, counter gathering Risk and monetary Risk
- Political Risks - sovereign Risks and nation Risk
- Specialized Risks - development Risk and operation and support chance
- Different Risks - advertise chance, deficiency of concession get, investors' Risk and Risks related with changes among key administration work force Inexperienced promoter may neglect the Risks in the BOT extend because of absence of data and instability about future condition and that likewise could be a Risk. Thus, easing measures must be built up and administered with mind by intends to decrease and deal with the Risks viably to a satisfactory level and limiting the odds of venture disappointment.

4. Project risk management in BOT projects

The achievement of the BOT extend relies upon the concessionaire's systems. The embraced systems are utilizing a propelled well demonstrated innovation and contracting out the duties, that empowered them to comprehend the idea of the Risks and how to reaction to it in a successful way. Notwithstanding that, the accomplishment of utilized Risk administration framework which could lessen the Risks to a satisfactory level to all partners is deniable. Fruitful Risk administration's key standards have been recognized:

- Clearly distinguished and noticeable senior administration bolster for the venture.
- Explicit strategies which are obviously conveyed to all.
- The reception of a straightforward and repeatable structure of exercises.
- The presence of a culture that backings and comprehends the ideas of controlling Risk.
- Fully inserted administration process which are reliably and thoroughly connected and are plainly connected to the accomplishment of the goals.

- Implementation of viable plans and standard surveys to guarantee the advantages of the procedures are acknowledged and lessons are found out for future activities.
- A very much organized Risk administration system inside the promoter's association is on a very basic level imperative to help the whole procedure of Risk administration amid the venture start and execution. Utilized far reaching Risk administration framework in the concessionaire will be the rule for any basic leadership to all started activity design amid the life cycle improvement of the venture.

Length: 96 Kms
 Evaluated cost of venture: 750.00 lacs.
 Date of work arrange: 23/03/1999
 Length of venture: 2 years
 Concession period: 16.25 years.
 Length of administration Road: One side Approach =2592 m.
 Opposite side Approach = 930 m.
 Extension length = 148.00 m.
 No. of paths: 2
 No. of Toll square: 2

B. Drive majeure Risk (Act of god)

As a conclusion, Risk examination and moderation is a critical procedure important so as to accomplish a fruitful venture financing .The contextual investigation portrays the venture foundation, the venture contractual worker, the financing of the venture, the Risk associated with each stage; the strategy used to restrict the Risks, the issues experienced the present status of the undertakings, and a general appraisal of the achievement or disappointment of the venture. A BOT extend in streets is influenced by different alternatives identifying with the toll structure, toll amendment plan, degree of government give, and the length of the concession time frame. This paper portrayed encourages the investigation of the money related feasibility of a BOT extend as influenced by the concession time frame, as showed by the contextual analysis. Via cautious thought of the consequences of the reenactment ponder, the venture support and the venture promoter can touch base at a sensible concurrence on the sharing of Risks and the terms of the concession.

The Risk of toll misfortune for (11+9) days

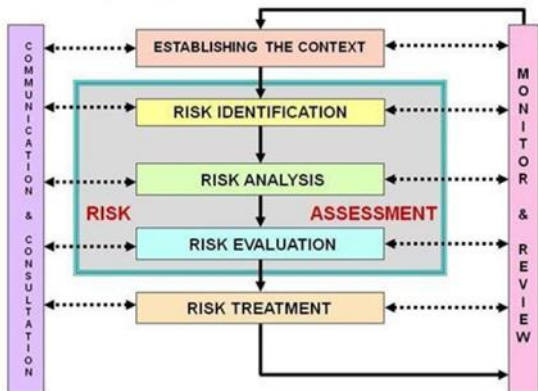


Fig. 2. Risk Management Process

5. Risk analysis for tolled road projects

A significant number of the difficulties engaged with creating and financing street ventures are like those confronted by before framework ventures. The issues, which accept exceptional significance on account of toll street ventures, however incorporate Risks related with securing of long fragments of right-of-way, cost and time invades in extend execution because of unexpected climate conditions and all the more significantly, the market Risks emerging out of troubles in estimating activity volumes and their affectability to toll rates. Such undertakings experience huge change in their Risk profile as they move from the pre –completion to the post-culmination organize. While allowing Risks and Risks related with convenient finish of the venture rule the pre-culmination period, the essential Risk in the post fulfillment period relates to the capacity of the extend to pull in the fundamental measure of activity, and furthermore for clients to pay the imperative measure of tolls.

A. Examination of a BOT road project

General Data

BOT

Name of client: Executive Engineer, P.W.D.

Name of the Company: M/S Jaypee DC Projects

Sort of agreement: B.O.T.

National parkway: NH-9(near patancheru, Hyderabad)

Table 1
Toll collection

No. of days on which toll was reduced (20%) below normal toll collection	Normal toll collection Rs.	Total loss of toll Rs.
11 days (April)	73,671/-	6,64,900/-
09 days (August)	90,984/-	7,06,904/-

6. Conclusion

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