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Feasibility Study of BOT Project- A Case Study of Vadape-Gonde Expressway

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Abstract - *BOT is a prominent road building strategy that involves public and private sector collaboration. The evolving road finance mechanism, on the other hand, has been marked by revisions to meet new criteria. The state of Maharashtra has made proactive steps toward the BOT strategy for road building under the PPP model. PPPs provide an opportunity for the state to meet its investment demands for road development. MSRDC has driven on private sector involvement in road projects. This research paper looks on the financial feasibility of the Mumbai Nasik Expressway, which was built under the BOT paradigm. The project entails the four-laning of the National Highway-3 portion from Vadape to Gonde (Mumbai-Nasik), which is 99.5 kilometers long. The research looks at the project's traffic and toll income data, and the feasibility analysis is done using a 20-year projection.*

***Key Words*: Transportation, BOT, Infrastructure, PPP, Expressway.**

1. INTRODUCTION

This In the last decades, as a result of social and political changes and interactions, the role of public institutes in infrastructure services has undergone some alterations. Toll roads are becoming increasingly popular across India for over a decade. The build-operate-transfer (BOT) concept, is a type of public-private partnership, was created to fund projects that required a lot of money and/or advanced building technologies.

After a few years, the toll road projects are projected to see a lot of traffic every day, consisting of a variety of vehicles ranging from personal automobiles, light and heavy commercial vehicles, multi axle trucks, and so on. In accordance with government policy, toll costs are enforced on most vehicles using toll roads. The ability of a project to service debt and achieve the desired equity rate of return is crucial to the BOT project's financial viability. BOT initiatives in India are potentially very dangerous and challenges due to variances in the legal profession, economic factors, and society. Using risk measurement tools, investors must detect and manage the important risk associated with BOT projects. The administration anticipates a major rise in private sector investment at both the central and provincial levels in the future. Various local bodies administer the state's road infrastructure, including the state's public works department, municipal corporation, Maharashtra state road development company (MSRDC), Maharashtra Industrial Development Corporation (MIDC), and the forest department. The state of Maharashtra has made proactive steps toward a PPP/BOT strategy to road building. MSRDC has pushed for private sector involvement in road projects.

The financial feasibility analysis of the Mumbai Nasik Expressway under the BOT model is examined in depth in this research report. The National Highway-3 stretch between Vadape to Gonde (Mumbai-Nasik) four-laned as part of the project.

2. OBJECTIVE

To study the nature of BOT project and contract.
To determine the feasibility of case study.
Analyze the project's economic output as well as the hazards involved in its implementation.

3. METHODOLOGY

Initially books, journals, conference proceedings and articles, websites, and other national and international sources were used to review material relating to BOT road projects.
The research is carried out by gathering data from the government, concessionaire companies, and the National Highway Traffic Safety Administration, as well as real observations of the number of vehicles.
The concession agreement, annual audited financial reports for the toll road, information about the toll charges, and the number of vehicles is some of the data collected.

1.1 Indian Infrastructure Situation

According to the current budget, India has emerged as the world's largest PPP market, with over 900 projects in various phases of development. PPPs have built some of the world's most iconic infrastructure, such as airports, ports, and motorways, which are used as models for expansion around the world.

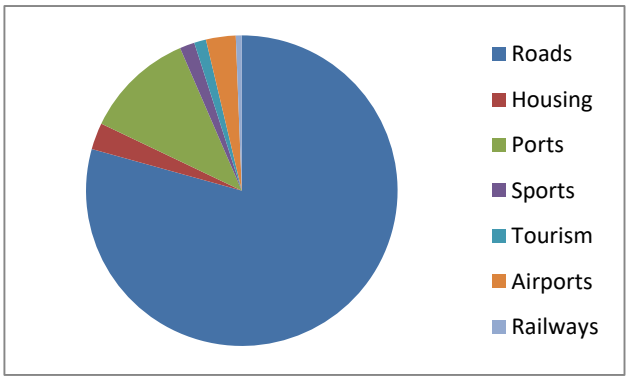

Chart - 1: Scenario of Indian infrastructure

1.2 Sources of Financing

A Public Private Partnership project will include financing from different sources, in some blend of value and obligation. The proportions of these diverse commitments will rely on upon arrangements between the moneylenders and the shareholders [4]. This sector investigates the fundamental sources of funding and the assertion in the financing conundrum that depicts the link between various investors, the bury loan master perception.

- Debt contributions
- Bank guarantees/ letter of credit/ performance guarantees
- Bond/ capital markets financing
- Mezzanine/ subordinated contributions
- Inter creditor agreement

1.3 Financial Analyses of BOT Projects Require Specific Parameters

- Financial Closure
- Wholesale Price Index (WPI)
- Cash flow
- Discount rate

4. DATA COLLECTION

This article discusses a case study that was used to better understand the financial evaluation of a BOT road project utilizing a variety of methodologies that will be addressed subsequently.

4.1 Background Information on the Project

The Mumbai Nasik Expressway Ltd (MNEL) is a special purpose vehicle developed by Gammon Infrastructure for the development, operation, and management of the Vadape to Gonde stretch of Maharashtra's National Highway no. 3. The Mumbai Nasik Expressway connects one of India's most major gateways, Mumbai, to the country's northern, central, and eastern regions. The National Highway-3 segment from Vadape to Gonde 99.5 (Mumbai-Nasik) will be four laned as part of the project. Gammon India, Sadbhav Engineering, and Billimoria consortium were awarded this contract in June 2005. This project has a 20-year concession/license duration that ends in October 2025. National Highways Authority of India is the client, and Gammon, Sadbhav Engineering Limited, and B.E. Billimoria & Co. Limited are the SPV's partners. The project is completed in the year 2010. Toll collecting will be MNEL's revenue stream. Recently Peak Infrastructure Pvt. Ltd. is looking after the Toll collection.

TABLE 1 - Project Description

Sr. No.	Particulars	Information
1	project is completed in the	Rs. 579 Million
2	Actual Project Cost incurred	Rs. 805 Million
3	Section	Km. 539.500 to km.440.000section on NH-3 (Vadpe-Gonde)
4	Length of the project	99.5 km.
5	Employer	NHAI
6	Independent Consultant (Construction Period)	Sheladia Associates INC in association with Artefacts Projects
7	Concessionaire	Mumbai nasik expressway ltd.
8	Location of toll plaza	At Km. 455+485 and 532+690
9	Date of Commencement	12-04-2012
10	Concession Period	20 Years
11	Construction period	36 Months
12	Extended construction Period	61 Months
13	Project Completion date Provisional	31-05-2011
14	Toll started on	29/05/2010 (at Milestone I) 03/ 09/2011(at Milestone ll)
15	Toll completion date	17 years of tolling commencing from 03-09-2011

Source: NHAI

4.2 Need of the Project

The NH-3 road which was there before the development was 2 lane. The percentage of people and goods travelling on this road is increased tremendous. Hence, it was the dire necessity to develop such road to overcome the traffic problems. Mumbai is called as the commercial capital of India and Nasik is famous for the Agricultural products such as onions, grapes, sugarcane, vegetables etc. Large percentage of these agricultural products are exported and for that sent to Mumbai from Nasik. To make the safe transportation the development of such road is very important.

Nasik has MIDC Satpur, and Ambad industrial zones where number of industries are situated and these people always want to travel from Nasik to Mumbai. The development of road saves the travel time, fuel consumption and the maintenance costs of the vehicles which indirectly help to save the money of travelers.

4.3 Salient Features of a Typical NHAI Concession Agreement (CA)

During the concession period, the concessionaire has the right to plan, engineer, finance, construct, operate, and maintain the project facilities, as well as levy and collect toll payments from cars utilizing the project.

The CA stipulates that the tolls would be levied at rates notified by a government agency and also defines the rates for annual escalation in toll rates.

The government proposed exemptions or subsidies for certain vehicle categories. While the traffic risks are borne by the concessionaire.

The concession agreement allocates the risks associated with securing various regulatory approvals, and acquisition of land to the project owner. It provides for an independent consultant or supervisor to monitor the progress and the quality of construction during the project period.

It also provides for the appointment of an O&M contractor to operate and maintain the highway during the concession period.

4.4 Projection of Traffic Volume

The traffic has been projected up to the horizon year 2030. The following is a forecast of traffic, both regular and induced traffic, in terms of vehicles and PCU, for the years 2005-2032 at 5-year intervals: The share of toll able traffic among goods trucks is considerable. About25% of goods vehicles are non toll able. This could be attributed to the fact that LCVs frequently travel short distances near cities. According to the IRC rules, a four-lane split carriageway can carry 80,000 PCUs per day.

TABLE 2 -Traffic Growth Rate Percentage as per Agreement

Year	**Up to 2005**	**2010**	**2015**	**2020**	**2025 On wards**
Car	6	5.5	5	4	3
Bus	5	4	3.5	3	3
LCV/Truck	6	5	4.5	4	3
Multi axle vehicle	4	3	3	3	3

The traffic growth rate per year on the basis of projection and actual data analyzed is as follows.

TABLE 3 -Traffic Projection of Total PCUs

Year	Total	% Grow	Total	Analysis	Actual % increase
2005	90,744		-	Not started	-
2010	1,22,643	6	58,43,476	Actual	-
2015	1,52,773	5	65,49,286	Actual	10
2020	1,85,082	4	1,82,50,000	Actual	23
2025	2,14,526	3	9,95,57,473	Projection	10
2030	2,48,060	3	11,20,52,812	Projection	11

Source- DPR for 4/6-laning of Gonde Vadape Section of NH-3, Volume IV and analyzed

Internal Rate of Return - Internal Rate of Return - Toll revenue is utilized as a crucial parameter to determine the Internal Rate of Return, which is based on the financial feasibility of the proposed project.

The syntax for IRR on Excel is = IRR (values, [guess])

Net Present Value (NPV) - The total of the present values (PVs) of incoming and outgoing cash flows over a period of time is referred to as the net present value (NPV) or net present worth (NPW) in finance. Benefit and cost cash flows can be used to represent inbound and outbound cash flows, respectively.

TABLE 4 -NPV & IRR

Year	Cash Flow (Rs. In Crs)
2010	-729.94
2011	51.25
2012	97.74
2013	130.614
2014	127.439
2015	131.898
2016	165.084
2017	184.182
2018	203.282
2019	222.378
2020	241.476
2021	260.574
2022	279.672
2023	298.77
2024	317.868
2025	336.966
2026	356.064
2027	375.162
2028	394.26
2029	413.358
2030	432.456
IRR	**20%**

NPV	255.05 Crore

The figure for the year 2010 shows the total cost of the project while the figures from the year 2011 to 2030 show the respective toll revenues. The actual data of cash inflow & outflow until 2020 is collected and that basis further calculations made by simple trend analysis' The IRR for the project is 20% as per the analysis of cash inflow and outflow where the discount factor is considered as 1.0%as given in concession agreement. With a decent grant from the government for O&M expenses, the project appears to be sustainable. The concessionaire is able to recover the capital cost within a period of 10 years approx. and also can have good profitability through toll collection over the period of concession as the number of vehicles and the toll rates both are increasing every Year.
The NPV of the project is 255.05 crore which is positive.

5. RESULT AND DISCUSSION

Cost-overrun Risk: As per the financial analysis it is observed that the Project cost decided as per Concession agreement was Rs. 579 crore but the Actual cost incurred as stated in the statements was Rs. 805 crores. Due to this the cost overrun risk is observed in the project implementation. It is observed that the increase in project cost was due to the delay in the completion of the project construction as the scheduled date of completion was 3 years from the date of agreement but it was not completed within the same period.

The reasons for delay were delay in land acquisition, and other force majeure risks due to opposition from local People. Due to delay in completion the other risks involved were inflation and delay in full fledged toll collection.

NPV of the project indicates that the project is feasible from the point of view of concessionaire.

Improper traffic forecasts: The traffic projections made in DPR are far less than the actual number of vehicle and the number of vehicles is increasing over a period of time. Due to this it results in delay in travel time due to queuing of vehicles at toll plaza.

Toll Charges: The toll charges are increased every year as they are linked with WPI. The toll collection shows an increasing trend. There is strong opposition by public to pay the tolls. Maintenance of roads is not done by the concessionaire properly and regularly.

6. CONCLUSION

The project's IRR and NPV are both positive, according to the financial analysis. As a result, the project is feasible from the concessionaire's perspective. The land acquisition procedure for PPP projects is the most difficult, and the government must make every effort to supply land for the project's construction. The award of project must be done only after the process of land acquisition completed. The building and operation of infrastructure projects have often major social and environmental consequences. As a result, BOT projects must have a development framework that is environmentally and socially conscious. As there is strong opposition by the public to pay the tolls it is important to make effective communication with people to get their support. The provisions of the concession agreement should be revised considering these problems faced by the stakeholders

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