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Satisfaction of Travelers about BOT Projects: A Case Study of Pimpalgaon-Nasik-Gonde (PNG) Project

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Abstract:

Infrastructure development is a precondition for economic growth. Due to Paucity of funds it is not possible for the Government to provide road connectivity to the increasing population. Thus emerged an idea of PPP to provide finance for infrastructure development under which the government seeks the participation of private sector for development of roads. BOT is a popular model for the road development in which the sharing is between public and private sector. Maharashtra state has taken proactive measures towards the PPP/BOT approach for the development of roads. The focus of this research study is on evaluation of the performance of the project and the factors affecting the satisfaction of road users through the case study of Pimpalgaon-Nasik-Gonde project and to identify the problems faced by the Users. The questionnaire was developed and a Pearson Chi-Square Test is conducted to show the results. The study shows the various risks and factors affecting road user's satisfaction such as delay in implementation, cost overrun, opposition to pay toll charges, environmental clearances, and proper maintenance of roads. There is a need to adopt a standard strategy to overcome these issues and proper coordination between Govt. authorities and private sector.

Keywords: PPP, BOT, Infrastructure, PNG, Pearson Chi-Square Test

1. Introduction

Inadequate transport infrastructure has been recognized as an impediment to the industrial and economic progress of any country. Governments worldwide invariably face the fiscal challenges to cope with the widening gap between needed investments and available budgetary resources for preserving and expanding highway infrastructure funding. This prompted the Government to involve the private sector in the financing, design, construction, and operation of major infrastructure projects, with a view to exploit the private initiatives to implement public projects in the form of Public-Private Partnerships (PPPs). The common element of a PPP is that the public sponsor of infrastructure projects engages the private sector to a greater degree in the performance of certain functions previously handled by the public sector. In this context, the Build Operate transfer (BOT) concept is becoming a popular mode of privatization of transport infrastructure development under PPP arrangement. Under BOT private entities receive the incentives to design, Build, finance, and operate the project for a fixed period and after the fixed period is over the ownership is transferred to government.

In Maharashtra state has taken pro-active measures towards the PPP/BOT approach for the development of roads. PPPs present an opportunity to meet the State's investments needs to make the development of roads. MSRDC has propelled private sector participation in road projects. The Pimpalgaon Nashik Gonde section forms a part of the AgraMumbai National Highway (NH3). The Project road commences at Km 380 outside Pimpalgaon and passes through Nashik from City to end at Km 440 near village Gonde. The existing highway passes through Pimpalgaon, Ozhar, HAL TownShip & Nashik city apart from various small towns and villages.

2. Literature Review

Zhang (2004a) stated that a key function in structuring SPV for PPP arrangement is obtaining private financing for ongoing operations. Under PPP arrangement, a SPV should have the capabilities to add value to the delivery of public services. Hence, PPP should only be applied to projects where the private sector has the competencies to meet the service standards required by the public sector. Yu Lin Huang (2005) stated that for the successful implementation of PPP projects, the identification of success factors is very important. For this the competence of the Govt. & the selection of appropriate concessionaire & proper risk allocation between the

public and private sectors, a sound financial package are the factors which are important for its successful implementation. The critical role of govt. is stated as - to create favorable investment environment, to establish adequate legal framework, to establish a co-coordinating & supportive authority, to select a suitable concessionaire & to be actively involved in project life cycle phases. Young Hoon et al (2009) explained that the issues that governments need to deal with for the BOT scheme to work smoothly are to establish adequate legal & regulatory framework, provide stable political environment, develop domestic capital market, ensure fair & competitive bidding, provide adequate govt. assistance and guarantees, conduct project feasibility studies, continuous assessment of project progress & performance. Hiren Maniar (2010) India identified the critical risks as delay in approval, change in law, cost overrun, dispatch constraint, land acquisition and compensation, enforceability of contracts, construction schedule, financial closing and environmental risk and the measures for mitigating these risks have been evaluated and the risk management framework is suggested. Satyanarayana N. Kalindini (2006) have discussed the contractual & risk allocation framework. They have observed that private sector organizations are reluctant to assume the traffic revenue risk & their reluctance is greatly influenced by inaccurate traffic data furnished the relevant public entities & users unwillingness to pay toll. These risks include price & quantify variations in financing rates, long term inflation, construction delays & non availability of lane to events beyond its control.

3. Objectives, Data & Methodology

3.1. Objectives of Study

1. To study the nature of project completed under PPP BOT model.
2. To review the literature related with BOT projects from the point of Value for money and feasibility of the project.
3. To analyze the satisfaction of travelers about the PNG project and study the long term impact of the project.

3.2. Statement of the Problem

“The Govt. adopted BOT model for infrastructure development in road sector.”

“The problems are increased in implementation of BOT projects and there is dissatisfaction of travelers”.

3.3. Data Sources and Methodology

Firstly literature related with the BOT road projects was reviewed through the journals, articles, and other research works at international level. The information was also collected through the interviews with the people involved in the project implementation which include the Project Director, NHAI, Nasik division and the company. A questionnaire randomly distributed to road users and data was collected from the travelers using BOT road at Pimpalgaon toll naka. This all information was documented personally and analyzed. The questionnaire aimed to achieve the several key features of BOT road projects including the satisfaction of travelers about the project, the social and economic impact of the projects. The data was analyzed to evaluate the findings from the analysis using Statistical Package for the Social Sciences (SPSS). The questions and responses were coded and entered in the computer using Microsoft Excel software. A Pearson Chi-Square Test & one way ANOVA was conducted to compare the overall satisfaction of travelers about the BOT project as Pimpalgaon Nashik Gonde Tollroad.

4. Project Background

Pimpalgaon Nashik Gonde Tollways Limited (PNGTL) – an SPV with 48 % shareholding of L&T IDPL and 26% shareholding of L&T, has executed the six lanes, 60 km stretch connecting Pimpalgaon–Nashik–Gonde section of NH-3, in Maharashtra on BOT basis. The project falls on the road that connects the financial capital of India - Mumbai to states like UP, MP, West Bengal and Orissa among others.

The scope of this project includes a 6.1 km long Elevated Corridor by-passing the thickly populated Nasik town. The SPV has designed, engineered, funded, and constructed the Project highway and is responsible for Toll Collection, operations and maintenance of the stretch for the period of concession. The concession period of this INR 16.91 billion project is 20 years, inclusive of the construction period of 30 months.

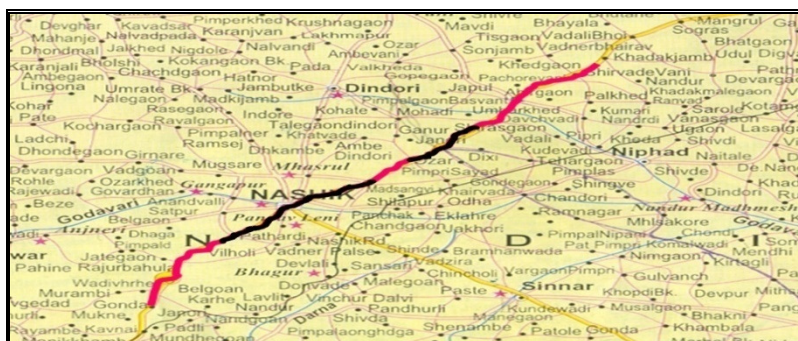


Figure 1: Project Map

Source: NHAI

Sr. No.	Particulars	Information
1	Length	60.00 Kms.of 6 lanes (NH. -3)
2	Name of the Contractor [Concessionaire in case of BOT / Annuity]	M/s PNG Tollways Ltd. Chennai, (Consortium of L&T – Ashoka Buildcon Ltd.)
3	Name of the Supervision Consultant [IE in case of BOT / Annuity]	M/s Sheladia Associates Inc. with Theme Engineering Service Pvt. Ltd.
4	Project Cost (Rs. In crores)	Rs.940 Crores
5	Grant / Premium	Premium in the form of Toll Revenue sharing
6	Toll Plaza	@ Pimpalgaon
7	Construction period	30 months
8	Date of Issue of LOA	15.01.2009
9	Date of Commencement	04.01.2010
10	Scheduled Date of Completion	01.07.2012
11	Toll collection started	02.10.2012
12	Scheduled End of Concession	03.01.2030

Table 1: Project Details: (BOT)
Source: concession Agreement and details by NHAI

5. Analysis of Survey Results

5.1. Opinion of the Respondents about the Overall Satisfaction about the BOT project PNG

To find out the level of user satisfaction, interviews were conducted with 150 users of BOT toll roads. The responses observed for each statement in the schedule have been scored to secure the total opinion for the respondents. 3 points are given for Satisfied, 2 points are given for Not satisfied, and 1 for neutral for positive statements and vice-versa for negative statements. The total opinion score of the respondent is obtained by adding up scores of all 20 statements. For testing the overall satisfaction of the travelers, Chi-Square Test has been employed. If the value is > 0.05 it is considered as significant opinion and if it is < 0.05 it is considered as not significant. Higher score indicate benefit / satisfaction of BOT and lower score indicate drawback or dissatisfaction from BOT. For negative statements higher scores shows dissatisfaction. The data was collected from 150 travelers at the toll naka which include the users of car, truck, van, bus.

The problems faced by the road users are analyzed through a questionnaire. The results obtained through the analysis are shown in Table 2

Sr.No.	Statement	Calculated F-Value	df	Asymp. Sig. (2-sided)	Significance >0.05 Significant <0.05 Insignificant
A) Value for Time & Money					
1	BOT project reduce the travel time	16.909 ^a	6	.010	Significant
2	BOT project has increased the travel comfort	2.415 ^a	6	.878	Significant
3	BOT project improve value for money	7.727 ^a	6	.259	Significant
4	BOT project has brought down the vehicle maintenance cost	2.838 ^a	6	.829	Significant
5	BOT project resulted in saving vehicle fuel consumption	7.278 ^a	6	.296	Significant
B) Role of Private Sector					
6	It leads to private sector monopoly in place of public sector	5.701 ^a	6	.457	Significant
7	Private sector has skillfully completed the project	19.105 ^a	6	.004	Insignificant
8	It put heavy future burden on public ex-chequer by way of contingent liabilities	9.958 ^a	6	.126	Significant
9	Possible for Public sector to create same project by deploying state funds instead of inviting private sector	24.081 ^a	6	.001	Insignificant
10	Traveler's grievances regarding toll roads are redressed properly	8.071 ^a	6	.233	Significant
11	The services provided ensuring better and efficient management	10.287 ^a	6	.113	Significant
12	The concession period granted is proportionate to the project cost and risk involved	12.932 ^a	6	.044	Insignificant
13	The toll management company safeguarding the interest of travelers continuously	7.246 ^a	6	.299	Significant
14	The maintenance of roads done properly and regularly	9.309 ^a	6	.157	Insignificant

15	The customer's interest taken care of by restricting the user charges / tariff/ toll at affordable rates	7.499 ^a	6	.277	Significant
C) Safety & Amenities					
16	The toll charges are reasonable	10.975 ^a	6	.089	Insignificant
17	The environment protection taken care of	7.162 ^a	6	.306	Insignificant
18	Get advance notice from government officers before revision of toll charges	11.527 ^a	6	.073	Insignificant
19	The risks and responsibilities of BOT projects are allocated properly between Government and concessionaire	4.739 ^a	6	.578	Insignificant
20	The exemption in toll given to some people is justifiable	15.738 ^a	6	.015	Significant
21	Satisfied with the services provided by toll management company	3.785 ^a	6	.706	Insignificant
22	Project resulted in employment generation to the local people	8.764 ^a	6	.187	Insignificant

Table 2: computed results of Pearson Chi-squared tests

Source: computed data

In Table 2 it is observed that out of 22 statements for 12 statements the result is significant which include the opinion about the comfortable travelling saving time, fuel & vehicle maintenance cost while for other 10 the results are insignificant which shows the dissatisfaction about the toll payment, and complaints about private sector.

- Overall Opinion of Travelers
- One way ANOVA (Toll Naka PNG)

Descriptives				
	N	Mean	Std. Deviation	Std. Error
Car	76	47.16	5.643	.647
Truck	16	43.44	6.293	1.573
Van	40	45.38	8.110	1.282
Bus	18	48.67	9.368	2.208
Total	150	46.47	7.027	.574

Overall Opinion of Travelers					
	Sum of Squares	df	Mean Square	Calculated F-Value	Table F-Value @0.5 Level
Between Groups	317.916	3	105.972	2.198	.091
Within Groups	7039.418	146	48.215		
Total	7357.333	149			

Table 3: Overall Opinion of Travelers

Source: computed data

A One-Way analysis of variance (ANOVA) was conducted on traveler's ratings of overall satisfaction about BOT toll road project of PNG. According to analysis $P = 0.091$ which is > 0.05 hence there is a statistically no significant difference in the opinion of travelers since $F(3, 146) = 2.198$, $p = 0.091$ i.e. > 0.05 . The overall satisfaction is not significant and there is no difference in the opinion of the owners of various vehicles as cars, truck, vans and buses.

Through the analysis as shown above it is proved that "The Govt. adopted BOT model for infrastructure development in road sector but the problems are increased in its implementation and there is dissatisfaction of travelers and they have many problems about the BOT road project".

6. Findings of the Study

This study investigated traveler's satisfaction about BOT Road project namely Pimpalgaon-Nasik-Gonde completed by MHAI using questionnaire survey to know their expectations. The results and findings are as follows.

6.1. Satisfaction of Travelers

As to whether the use of BOT roads shortened travel time compared with alternative roads, many of the respondents said it shortened travel time. About 80 % of respondents said BOT toll roads are far more expensive than those of alternative roads. In view of such a result, it can be said that, although BOT roads are relatively costlier in terms of user fees, people use them because of the shorter travel time and reduced fuel expenses, increase in travel comfort, improved value money & reduction in vehicle maintenance cost.

6.2. Role of Private Sector

As to whether the private sector has sufficiently demonstrated its creativity and efficiency in completing BOT project. The 65% of users are of the opinion that it leads to private sector monopoly, and they opined that even the private sector has skillfully constructed the road. 79% of travelers opined that there are various problems such as maintenance and management of the roads is not done properly and continuously, users grievances are not solved, and the concession period is not proportionate with the risks involved.

6.3. Value for Money

There is too much opposition to pay the toll by the users and they opined that the toll charges are not reasonable. The revision of toll is not informed and they are not satisfied about the exemption given to some toll users. There are many complaints about the services provided by the toll management company and the grievances of users are not solved immediately. 76% of travelers are of the opinion that the environment protection is not taken care by the private company.

7. Conclusions and Suggestions

To bridge the gap between supply of and increasing demand for roads, PPP road projects are developed through BOT under which the investment cost is recovered via payments from the end users. Although this mechanism has been seen as an efficient way for road projects to be completed on time and within budget, the problems faced by travelers and their satisfaction is very important.

The study investigated road users' satisfaction for PNG road project developed under BOT by using at least 150 samples of questionnaire in order to survey their satisfaction and to understand the problems faced by them. As per the analysis, the significant factors that most affected road users' satisfaction were higher toll charges, maintenance of roads, and increase in toll rates from time to time. The second most significant factor that affected road users' satisfaction was the role of private sector in the implementation of the project. There is positive opinion about the time saving and value for money and convenience. The other factors were amenities, environment protection, and maintenance of roads.

Based on this study, it can be suggested that the Govt. should take strict measures for maintenance of roads in order to keep the road conditions. The problems of the users should be solved and importance should be given to improve their safety and keeping the toll rates at minimum rates to cover the project cost only. The Govt. should give emphasis on satisfaction of users while developing the projects under BOT and keep control on Private concessionaire. The study could be continued further making survey with large sample and including more factors about user satisfaction.

8. References

- i. Rajan Pathan, & Dr.S.S. Pimplikar 2013", Risk Assessment of BOT projects", IOSR Journal of Mechanical & Civil Engg., ISSN 2278-1684 Vol.5,40-59.
- ii. Hiren Maniar (2010) "Risk Analysis of Infrastructure Projects- A Case Study on Build-Operate-Transfer Projects in India", The IUP Journal of Financial Risk Management Vol.II No.4 Infrastructure Development Reports.
- iii. Young Hoon Kwak , Ying Yi Chih, Willian Ibbs 2009, "Towards a Comprehensive understanding of public private partnerships for Infrastructure Development", California Mgt.Review.
- iv. Boeing Singh, Satyanarayana N. Kalidindi,2006, "Traffic revenue risk management through Annuity Model of PPP road projects in India", Science Direct Journal 605-613.
- v. Concession Agreement between NHAI and Private company, (2009)
- vi. Zhang, X (2004), " Concessionaire Selection: Methods and Criteria"J. Construction,Engg,Mgt., 10.1061/(ASCE)0733-9364(2004)130:235-244
- vii. Yu-Lin-Huang and Ahih-Pei-Chou,(2005), "Valuation of the minimum revenue guarantee and the option to abandon in BOT infrastructure projects", Journal of Const. Mgt. & Economics,24,379-389.
- viii. RBI Report on PPP in Transport sector.
- ix. World Bank, Private participation in infrastructure database: ppi.worldbank.org.
- x. www.nhai.org
- xi. www.sciencedirect.com
- xii. www.worldbank.org
- xiii. www.planningcommission.gov.in
- xiv. www.rbi.com