International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169
Volume: 4 Issue: 4 182 - 185

Economic and Financial Analysis for Feasibility Study of Public Private Partnership Road Project

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Abstract: Investment in infrastructure projects plays a key role in the efficient development of the country. Infrastructure project investment depends on the parameter like feasibility of the project which helps in the decision making process considering various aspects such as financing, designing, construction, operation and maintenance of the project. Public Private Partnership (PPP) gives valuable opportunity to Private Sector to contribute in the modern era in the development of Infrastructure projects. Private Sector's willingness to participate with Public Sector in the PPP depends on the economic and financial analysis of the project, which draws the viability in terms of benefits in near future as well as throughout the project life cycle. This study involves Economic and financial Analysis of existing 14.2 Km Thane-Ghodbunder PPP road project by improving existing four lane to six lane. Economic analysis results very large amount of savings in Vehicle Operating Cost due to improvement of Thane-Ghodbunder road and financial analysis results in the interest of benefits from the projects to either of the participant. Therefore, Thane-Ghodbunder road project which operates on Built, Operate and Transfer (BOT) basis can be beneficial for Private Partner.

Keywords: *Feasibility study; Public PrivatePartnership; Financial Analysis; Economic Analysis*

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I. INTRODUCTION

India is one of the quick creating nations on the planet. The future advancement of our nation is relying upon the improvement of its base and proficient conveyance of its administrations. Yet, the real issue confronted by numerous creating nations in finishing substantial base venture is, that of Financing. There is dependably a deficiency of assets with the Government, so a number of the undertakings get postponed or these activities must be scratched off. India must put expansive measure of cash in Infrastructure and its Maintenance. As there is expansive measure of Infrastructure to be assembled and it require substantial whole of cash a backing from Private segment is fundamental. This cooperation of Private Sector is vital both as far as Financing and as far as Implementation of the Infrastructure Project. Public Private Partnership (PPP) is along these lines considered as Inevitable, so as to succeed Indian Infrastructure. Interest in base ventures assumes a key part being developed of the nation. So as to figure out if the said venture ought to be attempted or not, its possibility should be considered in basic leadership as per the few distinct viewpoints. PPP gives most significant chance to Private Sector to take an interest in Public Sector projects or ventures, for example, financing, planning, development, operation and upkeep. Hence, the goal of the exploration is to investigate the idea of achievability study for Public Private Partnership extends and to do the monetary and budgetary examination of existing 14.2 km Thane-Ghodbunder street venture by enhancing existing four paths to six paths.

II. DATA COLLECTION AND METHOD

The ebb and flow research goes for completing the monetary and money related investigation of Thane-Ghodbunder Road Project which is on Public Private Partnership premise. Movement Data is gathered from Maharashtra State Road Development Corporation. Thane-Ghodbunder Road is state Highway No.42 beginning at chainage 497/00 km of NH-8 and completion at NH-3 close Kapurbawadi. It is one of the significant connections associating Eastern Express Highway (NH-3) to Mumbai-Ahmadabad Highway (NH-8). It is likewise an essential Road interfacing urban communities like Thane – Borivali/Dahisar, and so forth. The development of Thane and Mumbai City because of the fast industrialization has brought about extraordinary expanded in street activity on this connection. The exploration means to lessen this crevice by enhancing the current four paths to six paths.

2.1 Method used for economic and financial analysis

Out of the various methods of capital budgeting, the Internal Rate of Return Method (IRR) is the one used in the study. Internal rate of return is that discount rate, for which the NPV value is zero. This can be obtained by setting the value of NPV in Equation of Net present value method as zero, and solving (by trial and error) for the value of discount rate. If the rate of return thus calculated is more than the market interest, then the project is viable for execution.

2.2 Comparison of IRR to other standard methods

2.2.1 Cost Benefit Ratio Method

The cost-benefit model is simple to use, but sometimes when the cost-benefit ratio of two models are close to each other, it becomes difficult to interpret, and choose the best option. Some components whether will be treated as benefit or cost (i.e. whether it will go to the numerator or denominator), sometimes appear confusing. This is because savings in cost is benefit in other words.

2.2.2 Net Present Value Method

Similar to the cost-benefit ratio method, in the NPV method also some discount rate is assumed, and variousalternative projects are compared. If different discount rate is assumed instead, the order of choice among the alternatives may change. Hence, it becomes difficult to interpret the actual result.

2.2.3 Internal Rate of Return Method

IRR method itself finds out the discount rate, and therefore inaccuracy in analysis in assuming some arbitrary discount rate (as is done in cost-benefit ratio or in NPV method) is taken care.

Thus, IRR method seems to be the most preferred method for Economic and Financial analysis.

3.1 Economic Analysis

The purpose of the economic analysis is to select the most economic optimum solution among various alternatives investigated for the road project. The economic analysis balances the costs of various options against the benefits constituted by savings in road user costs. The selection of alternatives is based on the Net Present Value (NPV) and Internal Rate of Return (IRR). It compares the total NPV of all costs and benefits of an alternative with the NPV of all costs and benefits for the 'without project' alternative where the existing four-lane road is maintained. The Cost Benefit Data is tabulated as shown. (Table 1)

The Economic Internal Rate of Return for 15 years (EIRR) and Net Present Value (NPV) for the Thane Ghodbunder Project Road for Flexible Pavement option are as shown. (Table 2)

The results of the Economic analysis of Thane-Ghodbunder Road shows that the widening and strengthening of existing road is economically viable with an EIRR of 29 % for the total road project.

3.2 Financial Analysis on BOT Basis

The main objective of undertaking the current study is to assess whether the project is financially viable or not under Build Operate and Transfer (BOT) system. The basic methodology followed for estimating the financial viability of the project is to calculate the FIRR (Financial Internal Rate of Return) on the investment for the project.

III. DATA ANALYSIS AND RESULTS

By considering the total construction cost of the project, maintenance cost, toll revenue, benefits and other expenses; the financial internal rate of return is calculated as shown. (Table 3)

Table 1. Calculation of EIRR (Economical Internal Rate of Return)

		Case 1		Case 2				
Year	No. of Years	Maintenance Cost	Total VOC (Vehicle Operating Cost)	Construction & Maintenance Cost	Total VOC (Vehicle Operating Cost)	Cost Streams	Benefit Streams	Net Benefit
2004	0	3000000	515014785.71	230500000	488821951.76	230500000	26192833.95	-204307166.05
2005	1	3000000	536715843.54	37200000	509235928.77	37200000	27479914.78	-9720085.22
2006	2	3000000	529150501.16	4500000	502279219.69	4500000	26871281.47	22371281.47
2007	3	3000000	551585087.64	4500000	523448074.99	4500000	28137012.65	23637012.65
2008	4	3000000	576459688.69	4500000	545301391.93	4500000	31158296.76	26658296.76
2009	5	3000000	598866910.41	4500000	565309230.22	4500000	33557680.20	29057680.20
2010	6	3000000	622267550.96	4500000	587724335.40	4500000	34543215.56	30043215.56
2011	7	3000000	667677861.64	37200000	610996233.69	37200000	56681627.95	19481627.95
2012	8	3000000	775681223.90	4500000	635802809.94	4500000	139878413.95	135378413.95
2013	9	3000000	945942188.45	4500000	662392852.70	4500000	283549335.76	279049335.76
2014	10	3000000	994108735.90	4500000	684472860.22	4500000	309635875.69	305135875.69
2015	11	3000000	1046052176.13	4500000	707454871.27	4500000	338597304.86	334097304.86
2016	12	3000000	1102037498.11	4500000	731346277.81	4500000	370691220.29	366191220.29
2017	13	3000000	1156344748.83	37200000	756026670.63	37200000	400318078.20	363118078.20
2018	14	3000000	1211818664.66	4500000	781828998.37	4500000	429989666.29	425489666.29
2019	15	3000000	1272317576.40	4500000	808609809.88	4500000	463707766.52	459207766.52
2020	16	3000000	1339092282.52	4500000	836490652.08	4500000	502601630.44	498101630.44
2021	17	3000000	1413261579.82	4500000	864106458.67	4500000	549155121.15	544655121.15
2022	18	3000000	1496596601.84	4500000	898298503.60	4500000	598298098.25	593798098.25

Table 2. Economic Analysis Results in EIRR %

Thane-Ghodbunder Road	Economic Net Present Value of Net Benefits at 12 % Discount Rate (Rs in Lakhs)VOC only as Project Benefit	Economic Internal Rate of Return in %(EIRR)All Savings only as Project Benefit
Length 14.9km	5937.98	29%

Based on the project structure traffic study and toll rate analysis, financial analysis has been carried out and the results are as shown. (Table 4) The objective of the financial analysis is to make sure of the existence of project returns. These returns should successfully meet the expectations of private operator and its financial investors.

IV. CONCLUSION

The current research aims at carrying out the Economic Analysis of Thane-Ghodbunder Road project from both Economic appraisal of a project and Financial Analysis of private sector party's point of view, for their future benefits. In this project Economic appraisal of the project is calculated in terms of Vehicle Operating cost, means how much vehicle operating cost can be saved by implementing widening and strengthening of existing 4 lanes road to six lanes. This Economic analysis gives us an idea about whether this project is beneficial for road user in terms of saving in operating cost or not, and the analysis carried out states that it can be beneficial and viable.

Financial analysis is done to know whether private party's investment in the project and whether the desired benefits are achievable or not in the given concession period which is 15 years for this project. Also, the payback period is found to be 6.22 years which means that the allocated capital can be redeemed within this span. The results on financial analysis conclude that Private Partner can achieve his benefits. Therefore, the study concludes that the Thane-Ghodbunder Road Project which operates on Built, Operate and Transfer (BOT) basis can be beneficial for Private Partner. Improvement of Thane-Ghodbunder Road is also adding many Social Benefits to the Society.

Table 3. Calculation of FIRR

Year	Total Annual Toll Revenue
Construction Cost	-2442160000
Maintenance Cost	-160500000
2008	253306350
2009	286243950
2010	377948375
2011	427075550
2012	482617600
2013	645290800
2014	729151375
2015	823949175
2016	1319274250
2017	1490773150
2018	1684542525
2019	1903526100
2020	2598885775
2021	2936430475
2022	3024523389

Table 4. Financial Analysis Results in FIRR%

Thane Ghodbunder Road	Financial Internal Rate of Return in %(FIRR)
Length 14.9 km	21%

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