Our Heritage

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Evaluating Socio-Economic Feasibility of an Infrastructure: Case Study of Vadodara City

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Abstract

One of the basic components adding to the economic development of region is the formation of a transport infrastructure network. This network will in general be significant expense ventures and are essential to a nation's monetary improvement and flourishing. The socio-economic evaluation is one of the most essential and substantial commitments to the planning and decision making process inside the transport division when an initiative's demerits and merits are to be assessed. Socio-economic analysis gives an establishment to an efficient assessment of which undertaking types or activities that are socio-economically generally appropriate for handling an infrastructure network issue. Aim of this study is to select best possible alternative to evaluate socio-economic feasibility of an infrastructure facility and to improve mobility and accessibility in an efficient way to enhance living standards of habitants and residents. This paper focus on cost benefits analysis to determine socio economic feasibility of flyover. we are evaluating Socio economic feasibility of a flyover at Vadodara city, selected flyover is located at Manish cross road to Genda Circle (Vadodara) which is 3.5 km long and longest flyover of Gujrat state.

Introduction

What is Purpose of socio economic Feasibility study?

The primary purpose behind project socio-economic assessment is to help plan and choose projects that contribute to the welfare of a nation. It is most helpful when applied in early face of the project cycle and of restricted use when utilized once the project is submitted. the challenge to transport infrastructure network extension is to mobilize and allocate limited resources for potential projects that can maximize socio-economic benefits and minimize project risk[1]. The reason behind undertaking the feasibility study is to realize the various

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factors associated with the project. In a project lifecycle, the undertaking feasibility study is the second archive that is made after the analysis of cost and benefit.
By gathering thisdata, the higher authority would then be able to settle on an educated choice on which way ought to be sought after so as to make the most gainful beneficial stream for the organization. The project feasibility study will investigate the various markets where an intended interest group may be found.

How socio-economic Feasibility comes into the picture?

The analysis gives data about how the general public's assets from an economic perspective are utilized in the most ideal manner, and how costs and benefits are circulated between e.g. the state, the users and the environment.

It is a quality of socio-economic analysis that there need not be (actually, only rarely is) agreement between the cost and benefit elements applicable to a privately owned business and those relevant to the society as a whole. it is crucial in a socio-economic analysis to combine in addition costs and benefits to different bit of society so outside impacts (or externalities). This is, however, not the same as saying that the project that brings the best overall benefit to society has to be implemented. The decisions made from stakeholders and decision makers in general are often subjected to political agendas and investors' preferences. Hereby it is necessary to stress that a CBA is only functioning as a decision support tool in the overall decision process.

Society as whole doesn't have endless resources; consequently a getting sorted out is required between project alternatives. Pioneers need to pick sometimes between a couple of projects before another road is built or some new Infrastructure can be made. In this strategy the Cost Benefit Analysis (CBA) picks which project elective that benefits the overall population the most. This is, regardless, not equivalent to communicating that the project that passes on the best generally speaking benefit to society must be executed. The choices conveyed using assistants and supervisor when all is said in done are reliably exhibited to political plans and money related experts' inclinations. Thusly stretch that a CBA is essentially working as a choice assistance contraption in the general choice system.

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Cost benefit analysis (CBA)

CBA was first referenced in the report of Albert Gallatinin 1808 in the United States and he proposed connection to the extent cost and benefits in water infra structure projects. With the objective that it was the essential wide spread usage of CBA which was set up by the 'Federal Navigation Act - 1936'[9]. A cost-benefit analysis (CBA) is the framework used to check the benefits of a choice or making a move short the costs related with making that move. Understanding Cost-Benefit Analysis Before building new plant or taking on new project, sensible chiefs lead a cost-benefit analysis to evaluate all the potential costs and wages that an association may create from the project. The consequence of the analysis will choose if the project is financially attainable or if the association should look for after another project.

Cost-benefit analysis (CBA) is one of the ‘common’ methods used for project proposal evaluation and it has been applied in range of fields to provide comparisons. Many scholars haveproposed methods, tools, techniques and procedures in CBA, but the current challenge to evaluators is to determine feasible methods for assessments. In addition, the socio-economic factors associated with transport infrastructure projects are varied and may have great impacts on project success. Thus, the need to develop CBA methodology that is able to capture key socio-economic factors and enable practitioners to select methods for project evaluation is crucial[1].

What is an Infrastructure?

It is very hard to find a generally agreed definition of infrastructure even though economists in their early works already stressed that transport infrastructure is crucial for economic development. Infrastructure is usually understood as basic public infrastructure, which forms the foundation for society and economics. As it is mentioned in World Bank report (2004): infrastructure is an umbrella term for many activities, it plays a very important role for industrial and overall economy[3].

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Literature review

The EU transport infrastructure strategy, as defined in the TEN-T75 Guidelines, focuses on improving transport infrastructure quality through new investment and the efficient use of pre-existing infrastructure in order to improve accessibility, mobility and safety, as well as to match transport demand[4].Transportation research projects are a vital element for transportation agencies to accumulate new technology and knowledge to improve the efficiency and safety of transportation infrastructure. With transportation agencies experiencing tightening budget constraints it is necessary to select transportation research projects that provide the most benefits at lower costs. Author developed tools that utilize the BCA for defining the economic viability of a research project. The tools provide a process for estimating the benefits of increasing the Level of Service of a roadway, decreasing the travel time, reducing vehicle operating costs, and reducing the number of crashes. The BCA tools are only a guide for conducting a BCA, naturally there are other benefits that can be quantified from the research being implemented. These benefits can include improvements in transportation user's satisfaction, employment generation, industry related benefits, improvements to the surrounding wild- life/environment, and so forth.[5].CBA is useful and enlightening for evaluating a single investment, CBA really comes into its own when the relative merits of many alternative investments are compared against each other. CBA would be used as a prioritization instrument made planners 'trim' proposed investments by trying to reduce investment costs without significantly reducing benefits[6].. A cost benefit analysis is a method by which organizations can analyse decisions, systems or projects, or determine a value for intangibles.CBA results seem to play a particularly important role as a screening tool, helping planners to avoid investments with negative net benefits[1].

CBA analysis is a methodology that a tiny bit at a time responds to the basic request: what does the usage of an infrastructure brings to whom and what does it make from? These markers show whether a project is beneficial for organization and society. Furthermore, on account of a few projects, these pointers might be utilized for positioning the project as indicated by their advantage to the organization[4]

Cost-benefit analyses are comprised of two basic parts, namely:

- **Financial analysis**
- **Economic analysis.**

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Financial analysis

Financial analysis works with financial costs and revenues[7]. Financial analysis can be further divided in Three parts:1) Investment costs2) Operation and Maintenance (O&M) costs and 3) Revenue projections.

1) Investment costs:

Investment costs disaggregation is projectspecific, although the transport sub-sectors are usually characterised by common cost categories for both initial investment and renewals.
As general comments for any transport investment, the following can be highlighted:

- Estimates must be based on appropriate benchmarks with projects of practically identical qualities, in view of best accessible technologies, and so forth.;
- It is suggested to present total cost and unit value (Such as Cost per Km, cost per unit of fluctuating stocks and so forth);
- it is important to guarantee that the project will incorporate all the works required for its operating (for example, connections to the link networks, technological plants, urban renewal works adjacent to public transport investments, and so on.);

2) Operation and Maintenance (O&M) costs

In the transportation department O&M costs can be generally grouped into the following categories:

- infrastructure operations, e.g. repairs, current maintenance, materials, energy, Traffic Management System;
- services operations, e.g. staff cost, traffic management expenses, energy consumption, materials, consumables, rolling stocks maintenance, insurance, etc.;
- services management, e.g. services management itself, fare/tolls collection, company overheads, buildings, administration, etc.

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3) Revenue projections

Financial inflows will be spoken to by the returns from the charges applied to users for the entrance to the infrastructure or the sale of transport services, of land or structures. The gauge for the returns must be reliable with the interest versatility and patterns of logical factors and, in an increasingly broad sense, with traffic demonstrating output.

The estimation of income should be based on the following elements:

- traffic volume forecast (changes of passenger and heavy traffic);
- projection of changes in charge system and pricing policy;
- traffic forecast for each projection of charge system;
- subsidy/compensation projection.

Economic analysis

In transport projects the main direct benefits are measured by the change of the following measurable. The consumer surplus, defined as the excess of users' willingness-to-pay over the prevailing generalised cost of transport for a specific trip.

The main items for the estimation of the consumer surplus are:

- Tax paid by users;
- travel time;
- road users Vehicle Operating Costs.

The producer surplus, defined as the revenues accrued by the producer (example: owner and operators together) minus the costs borne. The change in the producer surplus is calculated as the difference between the change in the producer revenue less the change in the producer costs. This might be particularly relevant for public transport projects or toll road projects, especially if the project is expected to feature significant traffic (generated or induced) or a substantial change in fares.

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The main items to be considered for the estimation of the producer surplus are:

- fares paid by users (and received by the producer); and
- producer operating costs.[4]

The CBA concerns the Relationship between resources invested and the benefits that can be achieved and is a tool to determine the Infrastructure project's value for money (i.e. whether it is profitable for society). Specifically, the aim of a CBA is to compute the net present value (NPV) of a Infrastructure project or various project alternatives[8]**.**

From literature review it makes it fundamental that sensitivity analysis is carried out, trying the heartiness of the CBA result to changes in a portion of the key numbers. To explicitly deal with uncertainty it is common to use multiple scenarios for future developments in society, including the economy, and it is not uncommon to include sensitivity analyses for key assumptions, such as the valuation of outcomes of interest[10].A sensitivity analysis is test of the results of both financial and economic analyses to changes in the estimation of the considered factors is highly suggested. The CBA results should be tested for changes of at least the following variables (when relevant for the project):

- investment costs (as disaggregated as possible)
- O&M costs (as disaggregated as possible)
- assumptions on GDP trend
- demographic trend
- production trend, (when relevant) [4]

Limitations of CBA

CBA is a valuable decision support method, but it has a number of limitations. Perhaps the first is that it is seen as an expert-driven process that does not allow stakeholders to interact readily with the model.[1]

CBA is a valuable technique for informing infrastructure project evaluations but one that can be hard to apply well in practice.[1]

The difficulties in estimating future costs and benefits lie not only in the uncertainties and reliability of measurement, but also on the social costs and benefits generated as side effects.[10]

There are three types of weakness that lead to low CBA usefulness:

1) Normative Fundament: The CBA is seen as unethical and narrow as a decision criterion
2) Uncertainties and measurement problems the CBA is inconsistent, incomplete and inaccurate,
3) Appraisal optimism: The CBA is positively biased [11].

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Conclusion

Cost Benefit analysis is decision making tool which help stakeholders to check socio economic feasibility of project. project manager should apply a cost related estimation to the whole of the things on the cost-benefit list, taking remarkable thought not to underestimate costs or overestimate benefits. A moderate system with a perceptive effort to avoid any subjective tendencies when calculating estimate is most fitting when apportioning a value to the two costs and benefits for a cost-benefit analysis. Finally, the results of the complete costs and benefits should be stood out quantitatively from choose whether the benefits surpass the costs. Given this is valid, by then the recognizing decision is to proceed with the project. If not, then it should overview the project to check whether it can make changes as per either increase benefits or decrease costs to make the project sensible. Something different, the association ought to more likely than not avoid the project.

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References

[i] T. Nguyen, S. Cook, and I. Gunawan, "A functional design of a cost benefit analysis methodology for transport infrastructure projects," *2018 5th Int. Conf. Ind. Eng. Appl. ICIEA 2018*, pp. 54–59, 2018.

[ii] D. W. F. Barrell and P. J. Hills, "The application of cost-benefit analysis to transport investment projects in Britain," *Transportation (Amst).*, vol. 1, no. 1, pp. 29–54, 1972.

[iii] V. Snieska and I. Simkunaite, "Socio-economic impact of infrastructure investments," *Eng. Econ.*, vol. 3, no. 63, pp. 16–25, 2009.

[iv] U. Policy, *Guide to Cost-Benefit Analysis of Investment Projects*, no. December 2014. 2020.

[v] Nikolai Greer1 and Khaled Ksaibati1, "Development of Benefit Cost Analysis Tools for Evaluating Transportation Research Projects." .

[vi] "JONAS ELIASSON AND MATTIAS LUNDBERGDo Cost– Benefit Analyses Influence Transport Investment Decisions? Experiences from the Swedish Transport Investment Plan 2010 – 21,2012," .

[vii] S. E. E. Profile, and S. E. E. Profile, "ASSESSMENT OF THE FINANCIAL RISKS OF THE SMALL AND MEDIUM-SIZED ENTERPRISES IN SLOVAKIA," no. 1, pp. 1–2, 2018.

[viii] "1 cost-benefit analysis: concepts and practice, 4," pp. 1–28.

[ix] "Bert Van Weea & Sabine Roesera Ethical Theories and the Cost–Benefit Analysis-Based Ex Ante Evaluation of Transport Policies and Plans 2015." .

[x] "Abegaonkar Amit Anantrao, A. Mani Venkat Sai Kumar and A.K. Maurya Economic Evaluation of Transportation Project: A Case Study of Ferry System for IIT Guwahati 2016"

 Copyright © 2019Authors

ISSN: 0474-9030
Vol-68-Issue-1-January-2020

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[xi] G. Atkins, N. Davies, and T. K. Bishop, "How to value infrastructure," p. 51, 2017.

[17] N. Hanley and C. L. Spash, *Cost-benefit analysis and theenvironment:* Edward Elgar Aldershot, 1993.

[18] D. W. Barrell and P. J. Hills, "The application of cost-benefit analysisto transport investment projects in Britain," *Transportation*, vol. I,pp. 29-54, 1972.

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