

Sustainable Remedies for Infrastructure Project Delays

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Abstract - Nowadays, Delay is one of the biggest problems often experienced on infrastructure project sites. In India most of the projects are not completed within time. Completion time is very essential in project because "TIME IS MONEY" Any construction project success can be realized by achieving its objective within the planned time, budget and level of quality. The aim of this project is to investigate the causes and effect of delay on infrastructure project and suggest some remedial measures.

The top five causes of construction delays are land acquisition, environmental impact of project, financial problem, change order by client, poor site management, supervision by contractor. Large infrastructure project are inherently risky due to long planning

Technology is often not Standard. Highway construction suffers from delay and cost over runs due to the following causes which are - traffic problems, changes in design, poor planning, cost overruns, poor safety, and time delays. Our project work is based on Relative Importance Index (RII).

Key Words: Sustainability, Time delay, Cost overrun, Decision making, Uncertainty analysis, Time management, Delay management, etc.

1. INTRODUCTION

Time is money - and that is particularly true on a construction project. When construction projects don't run on time the contractor suffers because his overhead and expenses increase (eating into profits), and the owner suffers because he cannot open his new business on time, which causes lost profits that he could have been gaining. So, keeping projects on their critical path schedules very important. Construction projects tend to be one-offs. A project team comes together to create a unique development on a particular site under circumstances that will never be repeated. They are very complex, requiring the co-ordination of permissions, people, goods, plant and materials and construction can begin despite many unknown matters such as incomplete design information, uncertain site conditions, suppliers and so on. India is one of the leading outsourcing hubs in the world. However the

world judges us not just by the talent we love to offer but also on the basis of our road infrastructure capabilities. Given this factor road infrastructure development has been a key focus area in every Indian state more so in the recent past. At the center as well big budgets have been allocated for road infrastructure developments in every five year plan.

However the country has consistently fallen short of meeting as such targets over the last few years. This road projects have been invariably riddled with issue of time and cost overrun. With the objectives of finding out the reasons of such schedule and cost overrun, Ministry Of Statistics and Programme Implementations (MOSPI) recommended PMI to conduct a study in consultation with KPMG to highlight the major reasons for the time and cost overruns across major sectors in infrastructure projects. The project surveyed in this report are from nine sectors in the infrastructure space viz Power, Petroleum, Coal, Steel, Railways, Roads and Highways, Civil Aviation, Ports & Shipping. It is known fact that a large no of road infrastructure projects in India have been delayed due to regulatory clearances, environmental issues and problems related to land acquisition. Almost 79% of our respondents felt that the road infrastructure sectors faces an acute shortage of skilled project managers. In the twelfth five year plan, the government has planned to focus on improving the project management skills across country to get better from public investment in road infrastructure and also in the social sectors. Delays are an integral part of any construction project. India being rapidly developing country needs an equally rapidly developing infrastructure also, Delay can lead to many Negative effect such as lawsuits between owners and contractors, increased cost, loss of productivity and contract termination etc. Construction delay can be defined as extension of time to complete the project. It is a situation when the actual progress of the project is slower than the actual schedule. Hence it is more necessary to study causes and effects of delay in the infrastructure projects and also suggest some remedial measure for that. Since the delay in infrastructure project affects the economy of any country is important for the projects to be completed within the budgeted cost and time.

The focus of our project is to study the root causes of delay in road construction projects and also give some remedial measures to avoid the delay. It is needed to conduct detailed investigation and identification of delay factors and then selecting the right actions to counter these delay factors within cost and maintaining quality. The faults and errors due to the contractor cause delays and waste of capital and time. Our study focuses on various factors causing the delays.

1. To identify various causes of the delays
2. How unpredicted delays can cause delays resulting in delays of the total project.
3. The effects of the delays on the project.
4. Study the causes and effects of the delays at various projects and to find out the most important causes.

2. OBJECTIVES

Infrastructure projects are in some ways unique and different from real estate Projects. Hence this study would state the causes of delays faced in Infrastructure Projects, and analyze them in detail.

The main objectives of this project basically are:

1. To determine the common time and cost overruns in transportation infrastructure projects in Pune City.
2. To determine the different stages in the project life cycle and the salient causes of delays in each of the different stages.

There are 5 phases in project life cycle. They are as follows.

- Initiation of the Project.
 - Planning The Project Project Execution
 - IV Project control
 - Project Closure
3. To find out the main causes of delays prevalent in transportation infrastructure projects and to validate the causes through a case study

3. LITERATURE REVIEW

In analyzing time and cost over of construction projects in India

Ms. Yogita Honrad, Prof D.B Desai (June 2015) came out with the objective that some parties involved in the construction industries identified a total of 53 cases and 11 effects which are mainly affecting the delay in highway construction project. The research paper concluded that a listing of root causes & issues that are directly responsible for most infrastructure construction project delays. Additionally it is found that fundamental principles must be adopted before significant improvement can be made¹.

S.M. Vidalis & F.T. Najafi (June 2002)- came out with the main objective that is to determine the types of delay that have caused cost and time overruns. Hence this research paper concluded that factors causing cost and time overruns are plans modifications change conditions, lack of project coordination, and design related problems. The study results indicated that to carefully examine each construction contract to minimize delay².

Dr. Ralph D. Ellis & Dr. H. Randolph Thomas (July 2002)- the root causes of highway construction delay were identified by the researchers. Their objective was the fundamental principles necessary for improving the time performance on highway construction are presented, And analysis of project records was performed to identify the reasons for adding time to construction projects. Therefore they concluded that the first step in reducing delay in highway construction is to understand the root cause of delay. The results provide a listing of issues that are directly responsible for most highway construction delay³.

S.K. Patil, A.K. Gupta, D. B. Desai, and A.S. Sajane (Nov 2013)- the main objectives of this study include the following to identify the causes of delays in construction industry in India. To test the importance of the causes of delay between parties involved in project. To way the differences in perception of the three major parties in any construction namely, owners, contractors and contractor. This study aims to investigate the important causes of delay in transportation infrastructure projects. The results revealed that the problem of construction delays in transportation infrastructure projects is frequent and notable⁴.

Abdalla M. Odeb & Hussein T. Battaineh (June 2002)- the object of this research is to identify the major causes of delay in road construction industry & tone the relative importance of this causes for the traditional type of contract from the view pes construction contractors & consultants. They concluded according to contractoni, labour productivity was the most important delay fatut. Inadequate contractor experience. however was the most important delay factor to contents. Moreover delays used by sub contractors, slow decision making by owners, improper planning & labour productivity were among the top 10 most important factors for delay⁵.

Ibrahim Mahamid(2013) -this study aims at identifying the common raks affecting time overnin in road construction projects in the Wet Bank in Palestine from contractors vie point 45 factors that might cause delays of road construction projects were defined through a detailed literature review. A questionnaire survey was performed to rank the considered factors in terms of severity and frequency. The analysis of the survey indicated that the top risks affecting time overrun in road construction projects in Palestine are: financial status of contractors, payment delays by the owner, the political situation and segmentation of the West Bank, poor communication between construction parties, lack of equipment efficiency and high competition in bids⁶.

Ashish Ram, Dr. Pratheeba Paul(Mar-Apr. 2015) - this paper articulates to study about the delay causes and factors that contribute to the construction sequence delay for the road infrastructure projects and how one can predict the fature copletion date for the delayed project using kernel value me From the intricate atalysis of the questionnaire survey it has been found that delay in land acquisition is the major cause for delay in road infrastructure projects. By booking at the root cause for delay in the road construction the contractor can claim for extension of time EoT) if the delay is creusable. In case of any delays the EVM is found to be helpful in finding out the probable completion time for the projects⁷.

Remon F Aziz, Asman A. Abdel-Hakam(March 2016)- this paper studied a list of construction delay causes gathered from literature wine different types of construction different countries, different periods and different number of delay causes and delay groups. A case study is analyzed and compared to the most important delay causes in the paper. According to the analysis of the case study the most contributing cases and groups to delays were discussed and some future

recommendations were proposed in order to minimize and control delays in road construction project. These findings can be helpful for project managers to mitigate the road construction delays in Egypt. Also this paper in useful for both researchers and road construction parties and allows detailed analysis of the progress of road construction project in order to facilitate and achieve a competitive level of time, cost and quality for effective road construction projects⁸.

Prof :Siddesh K Pai, Mr. J. Raj Bharat(March 2013)- this paper deals with the causes which critically effect in delay of infrastructure projects indi. The delays and cost overrun i have become a hallmark of infrastructure projects in india A survey with different construction companies in india have been done to find out the critical reasons which are mainly affecting the delay of construction projects in india Hence this concluded that the first step in reducing the delays in infrastructure construction industry is to understand the root cause of the delay. The results provide a listing of root causes and issues that are directly responsible for most infrastructure construction project delay⁹.

Ashwini Arun Salunkhe, Rahul S Patil (March 2013)- the objective of this research is that to improve the performance of the project it is important to study the delay factors which affect the success of the project. The purpose of this study is to logically explore the delays factors of projects and how these can be avoided and controlled. With the help of detailed literature review and interviews the construction delay factors were grouped into 7 categories, which will give parameters that could have direct effect on the success of the project. Hence it is important to study and analyze the causes of construction delays, as the services provided by them serve input for other sectors and cost overrun m these projects lead to an increase in capital output nitio for the entire economy¹⁰.

4. METHODOLOGY

1. Identification of research area

- Discussion with the guide
- Expert views
- Books
- Internet

2. Initial study

- Aim & Objectives of project

- Ideal study for delay in road construction
 - Identification of Topic
3. Nature of Project
- Defining scope of project
4. RII (Relative Importance Index)

2. Lack of experience to consultant
3. Conflict between consultants
4. Insufficient data collection and survey before design
5. Financial independence
6. Inadequate contractor experience
7. Incompetent project team
8. Inappropriate construction methods
9. Poor site management and supervision
10. Intermittent stoppage of work due to cash flow constrains
11. Changes in material types and specifications during construction
12. Design change by owner or his agents during construction
13. Poor communication and coordination with other parties
14. Delay in providing services from utilities (such as water, electricity)
15. Loss of time by traffic control and restriction at project site.
16. Delays resulting from neutral causes
17. Delays that are the fault of the client
18. Delays that are the fault of the contractor.
19. Concurrent delays
20. Is there trust, understanding & owner decision making authority among & between the owner & lead
21. Slowness in approving drawing & material samples by the consultant.
22. All design changes being identified & discussed with vendors & contractors
23. Frequently unexpected modifications in specification of material during construction
24. Traffic control at site

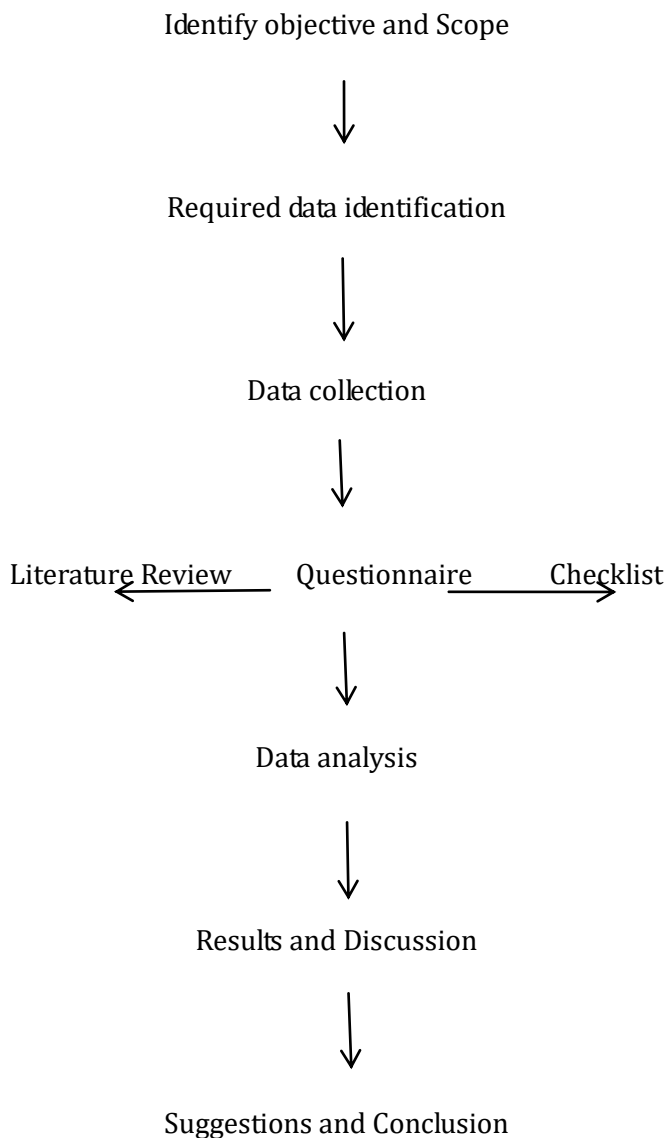


Fig. 1 Research Methodology Flow Chart

4.1 Review causes of delay

From literature review there are 25 causes of delay in highway as well as bridge construction that are quite found in many researches summarized the basic items are:

1. Delay in assessing/evaluating major change in scope of work

25. Changes in site conditions

From these 25 major causes of delay, this research investigated the top rank reason of delay based on data collection through the case study.

5. Discussion

The research through literature reviews and discussion with some parties involved in the construction industry identified a total of 82 causes which are mainly effecting in the delay of road construction projects. A questionnaire was developed in order to evaluate the frequency of occurrence, severity and importance of the identified causes. Data were gathered through a survey taking in view owners, contractors and consultants. Agreement on the ranking of the importance of the causes of delay between each two groups of parties was also tested. Recommendations for minimizing delay in construction projects are emphasized in view of the results of the study.

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