



Review On Management And Analysis Of Various Risks During Construction Of PPP Highway Projects

¹Swikar Patil, ²Mustaqeem Sathe, ³Yash Patel

¹PG Student, ² PG Student, ³ PG Student
MITCOM MIT, ADT UNIVERSITY,
Pune, India.

ABSTRACT : This article presents research findings on the use of risk analysis techniques and tools to determine its impact on highway project construction cost and schedule performance values. Analyzes included project information and characteristics and cost and schedule impact assessments of project risks. Analyzes of responses from both public and private sector Highway construction professionals. The review response provided both quantitative and qualitative information on several previously completed road construction projects. Statistical dependency correlation analyzes showed that the use of risk analysis in project improved project and construction management practices.

Keywords- Risk drivers, risk assessment, risk management, highway construction

CHAPTER 1 INTRODUCTION

The construction process involves many uncertainties and risks, which increase with the scale and complexity of the project. Risk is defined in different ways. The Project Management Institute (PMI) defines project risk as an uncertain event or condition, the occurrence of which has a positive or negative impact on one or more project objectives, such as: B. Time, Cost, Scope or Quality (PMI 2004). Project risk has one or more causes and consequences, and project risk management can be a formal or informal process.

According to PMI (2004), "Project risk management includes processes related to executing project risk management plans, identification, analysis, response, monitoring and control. will be updated accordingly." (2006) emphasized the importance of risk assessment, risk allocation, and risk management for effective management of highway construction projects. Risk management should be proactive and identify potential problems

CHAPTER 2 OBJECTIVE & SCOPE

The purpose of this study was to understand and assess the understanding of transportation professionals regarding construction risk management and significant risk factors in the context of highway construction.

The purpose of this work was to analysis and understand the effect of using risk analysis on the performance of highway construction projects. The analysis looked at project-specific information and characteristics and their correlations with estimates of the effect of significant risk factors observed on the total cost and time of the project.

CHAPTER 3 LITERATURE REVIEW

Molenaar (2005) emphasized the importance and effectiveness of using risk management and other cost management processes in reducing the expected costs of projects. Akintoye and MacLeod (1997) investigated perceived risk and found that UK contractors and project managers use perceived risk as the likelihood that unforeseen factors will occur that could negatively affect the successful completion of a project in terms of cost, time and quality. and realized that risk analysis and management are key to improving performance.

Design-Build (DB) is an alternative to the Project-Bid-Build (DBB) project delivery method in many countries around the world, including the United States. In the DB project delivery method, the design and construction phases of the project are combined into one contract. In a study and construction efficiency study (SAIC et al. 2006) sponsored by the Federal Highway Administration (FHWA), data analysis showed the following.

- For both construction and road projects, project durations were found to be 4-60 percent shorter in projects using the DB project delivery method compared to projects using the DBB project delivery method;
- For both construction and highway projects, the DB method typically resulted in lower project costs compared to the DBB method. However, costs are reduced by 18 percent to 23 percent when the DB method is used instead of the DBB method; and
- The increased use of the DB method in the public sector and the need to improve the efficiency and quality of public road projects require knowledge of all the performance and risk metrics of this method.

Literature reviews and interaction with construction industry professionals enabled the correct identification of programmatic and project-specific construction risk factors in highway projects. A qualitative risk assessment was performed in previous studies and was used in this study to identify important risk factors and develop a risk factor assessment for the presented projects. However, previous studies did not relate project characteristics to various construction risk factors of road projects in quantitative evaluations, which highlighted the need for further research and motivated the research for this study (Diab, 2011). To address this need, this article analyses and presents correlations of dependence between the use of risk analysis, some characteristics of the reported projects, and cost and schedule impact estimates of the observed risk factors.

CHAPTER 4 METHODOLOGY

This study's goal is to examine the full risk management process for the road construction project. This procedure includes identifying the list of hazards associated with road construction projects and defining the most important risks through the review process.

Mainly the research is based on three phases

Phase I: Identifying the risk

Phase II: Evaluating the risk

Phase III: Analyzing through SPSS Software.

We can discover 44 dangers in the identification of the risks and list them all. The discovered risks should be divided into categories such as technical risk, financial risk, Site risk, Commercial risk, Political risk, Socioeconomical risk, and Environmental risk.

On various categories of risk, a pilot survey is conducted. To learn more about the dangers and their effects, a questionnaire survey is carried out. SPSS (Statistical Package for the Social Sciences) software is used to analyze the questionnaire survey in order to obtain more precise results.

Based on the SPSS software's findings, we may assess the factor that is most likely to have an impact and the risk that is most likely to occur, and then take steps to reduce those risks.

CHAPTER 5 STEPS IN RISK MANAGEMENT

i. Identifying the risk

Risk identification in risk management requires a number of processes or techniques, including questionnaires, organizational records, flowcharts, professional expertise, and on-site investigations.

ii. Analyzing the risk

Firstly, we can identify the possible threats and then estimate the likelihood of their occurrence. Steps to analyzing the risk include:

Step 1: Select an area of operation for analyzing the risks.

Step 2: Describe the risk exposure.

Step 3: Detail the facts from the records of the previous losses.

Step 4: Probability of risk should be assessed.

Step 5: Indicate the risk controls which already exists.

Step 6: Maximum financial consequences of the risk should be estimated.

Step 7: Assess and calculate the total financial impact of the risk exposure.

Step 8: Risk management response should be determined.

Step 9: A questionnaire should be developed to gain deeper understanding of the associated risks. Which will help in coming future.

iii. Evaluating and ranking the risk

The amount and impact of the risk parameter on the project are determined before the risk is evaluated. Relative Risk Ranking, Risk Indexing, Risk Matrix, and Risk Filtering are other names for risk ranking. Its goal is to bring a system's essential hazards into closer focus, usually from a vast and complicated set of risk scenarios.

iv. Monitoring and reviewing the risk

The ultimate goal is to eliminate or lessen the dangers associated with various risks, which can be achieved by routine monitoring, which includes:

- Impact identification.
Identifying which is more harmful and how.
- Making a decision based upon hazards of risk to eliminating.
- Apply suitable solutions for the findings.

Apply mitigation measures after the incident.

CHAPTER 6 DATA ANALYSIS

Investigating and analyzing the frequency table and chi-square dependence data yielded some interesting insights. Regarding the use of risk assessment in both public and private sector projects, approximately 51% of respondents use risk assessment in some projects and 36% of respondents use risk assessment in all projects. I understand that you are. In addition, 70% of respondents said he has more than 10 years of experience, which is encouraging and lends credibility to the data collected from survey responses on highway construction project risks. A majority of respondents believe that risk management plays a key role in the cost and time performance of highway construction projects. In fact, about 80% of respondents believe risk management is important. This is very important, or very important to the good performance of highway construction projects, and certainly a key recognition that risk management can lead to the success of the project.

CHAPTER 7 CONCLUSION

The majority of respondents (80%) said that risk assessment was crucial for projects involving the construction of highways. Organizations in the commercial sector used risk assessments more frequently than those in the public sector. Compared to design bid build highway projects, it has been employed more frequently in design build projects. This may be because formal risk assessment is now increasingly necessary and is thought to be a crucial component of the planning phase. The rationale for this, from the perspective of construction management, is that the use of risk assessment has the potential to have a substantially greater negative influence on cost and time performance for design build

The entire risk is considerably increased by elements including poor planning, unexpected soil conditions, resources, force majeure, and political concerns. Political risk, the threat of war, and owner changes have very little to no effect on risk, according to the report, which rates their influence as "very low" to "moderate." It can be determined that site circumstances, climatic conditions, criminal activity, bribery, and existing traffic have no bearing on project risk. It is known which elements are affecting the project and what is believed to be their influence via risk analysis using SPSS.

By properly and frequently revising plans, risk connected with planning and its adjustments can be avoided. An adequate traffic detour must be offered to reduce traffic risk. Utilizing prefabricated building can help mitigate some of the risk associated with site and climate conditions. By properly allocating funding and closely observing project activity, political and governmental risks can be mitigated. Site study should be done prior to project execution to reduce risk related to soil conditions and other factors. With the aid of organized government bodies, criminal and political threats can be decreased.

CHAPTER 8 REFERENCES

1. AASHTO. (2008) AASHTO Guide for Design-Build Procurement. Washington, DC, 27-33.
2. Akintoye, A. and MacLeod, M. (1997) "Risk analysis and management in construction." International Journal of Project Management, 15 (1), 31-38.
3. Ashley, D., Diekmann, J., and Molenaar, K. (2006). "Guide to risk assessment and allocation for highway construction management." FHA, International Technology Scanning Program. Office of international program, FHA, Washington, DC, 4-17.
4. Diab, M. (2011) Analyses of highway project construction risks, performance, and contingency, ProQuest, Ann Arbor, MI, 56-102.
5. Flyvbjerg, B., Holm, M., and Buhl, S. (2002). "Underestimating Costs in Public Works Projects-Error or Lie? ". APA Journal, 68 (3), 279-295.
6. Lam, P. (1999). "A Sectoral review of risks associated with major infrastructure projects". International Journal of Project Management 17, (2), 77-87.
7. [Molenaar, K. (2005). "Programmatic cost risk analysis for highway megaprojects". Journal of Construction Engineering and Management 131(3), 343-353.

8. Nassar, K., Nassar, W., and Hegab, M. (2005) "Evaluating Cost Overruns of Asphalt Paving Project Using Statistical Process Control Methods". *Journal of Construction Engineering and Management* 131(11), 1173-1178.
9. PMI. (2004). "A Guide to the project management body of knowledge." Project Management Institute, Newtown Square, PA, 237-268.Hosseini, Kuan Yew Wong, Amir Zavichi -2018.
10. STRATEGIC APPLICATION OF LEAN THINKING- Naomi Garnett¹, Daniel T. Jones², and Simon Murray³- Construction Management Research, Reading, U.K.-2003
- a. Sotoodeh Gohar, M. Khanzadi, Maryam Farmani. (2012) Identifying and Evaluating Risks of construction Projects in Fuzzy Environment: A Case Study in Iranian Construction Industry. *Indian Journal of Science and technology*. November; 5 (11)
11. Mohamed Sayed Bassiony Ahmed Abd El-Karim Omar Aly Mosa El Nawawy Ahmed Mohamed Abdel-Alim,(2015), Identification and assessment of risk factors affecting construction projects, Elsevier.
12. Yanjun Zhao, Xiaojun Liu, Yan Zhao, (2011), Forecast for construction engineering risk based on fuzzy sets and systems theory, Elsevier, 16-161.
13. W. Dhawale¹ , S. C. Tandale,(2014) Analysis of Critical Factors Affecting The Construction Projects In Pune Region, India, *International Journal of Civil Engineering and Technology* 5(3), pp. 209216.
14. Saleh Alawi Ahmad, Usama H. Issa, Moataz Awad Farag, Laila M. Abdelhafez (2013). Evaluation of Risk Factors Affecting Time and Cost of Construction Projects in Yemen. *International Journal of Management*, 4(5), pp. 168-198.
15. Aitwar Vishambar, Sontakke Kaustubh, Patel Kartik, Ashwini Salunkhe. (2016) Risk Planning in Construction of Highway Project: Case Study, *International Journal of Latest Research in Engineering and Technology*, March; 2 (3) pp. 57-63

