# FACTORS INFLUENCING THE DURATION OF ROAD CONSTRUCTION PROJECTS IN SRI LANKA

BY

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Supervised by

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This dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirement for the Degree of Master of Science in Construction Project Management.

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# Abstract

One of the most important problems in the construction industry is delays. Delays occur in every construction project and the magnitude of these delays varies considerably from project to project. Hence, the duration of construction projects right from inception to completion is assumed great importance in the construction industry. Further, in many instances it is most cost-effective to complete a project within the shortest possible time.

Most of Road Construction Projects in Sri Lanka are experienced larger delays, and hence it's badly affected to the economy in many ways. Further, this has been identified as a socio-economic problem, and therefore an urgent rectification is required.

This study attempted to reveal the Factors Influencing the Duration of Road Construction Projects in Sri Lanka, and to identify how delays can be mitigated. The emphasis here was limited to study the Contractor's point of view. The main concern of the study was to Predict the nature of the Population using Statistical Inference - Identify the Confidence Interval for Population Mean of Percentage Delay via sample analysis. The other focusing areas were, Main Causes of Delay & Delay Diversification - Identify the Probable Reasons, which affect the Duration of Road Construction Projects, and Highlight the key / dominant factors of delay and identify how they are distributed, and Delay Mitigation - Identify how the effects of delays can be minimised.

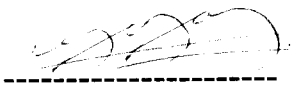
The preliminary data for this research have been collected through a literature review and the use of a questionnaire survey targeted at local contractors of Road Construction. The data acquired were yielded a high reliability coefficient (90%).

This study defines the Percentage Delay parameter, and the Relative Significance Index (RSI) model, which are the new concepts introduced by the author this study.

This study found that the local road construction projects are experienced 56 % - 88 % of average time overrun compared to the original (planned) project duration. The findings further revealed that the financial problems of the Owner as well as of the Contractor, is the most influencing factor in causing delay in road construction projects in Sri Lanka. Poor site management by the Contractor, followed by poor weather conditions that is an External Factor, contract modifications by the Owner, incomplete documents, delayed and slow supervision in making decisions and giving instructions by both the Consultant and the Owner are appeared to be the next critical factors in causing delays in local road constructions. Further, the responsibilities of the Contractor such as, shortage of site labour and materials, lack of subcontractor's skills, construction mistakes and defective work, poor skills and experience of labour, and finally delay in delivery of materials to site were revealed as the factors with significant probability of causing delays.

## DECLARATION

I hereby certify that this dissertation does not incorporate any material without acknowledgement, and material previously submitted for a degree or diploma in any university to the best of my knowledge, and further I believe it does not contain any material previously published, written or orally communicated by another person except where due reference is made in the text.



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25/01/2010
Date



This is to certify that this thesis submitted by Yasas L. Pathiranage is a record of the candidate's own work carried out by him under my supervision. The matter embodied in this thesis is original and has not been submitted for the award of any other degree.

***UOM Verified Signature***

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# TABLE OF CONTENTS

## LIST OF FIGURES

## LIST OF TABLES

## LIST OF SYMBOLS

| | |
|---|---|
| $d_i$ | - Percentage Delay |
| $t_{ActuallyElapsed}$ | - Actual Time Elapsed for the Completion |
| $t_{Planned}$ | - Planned Project Duration |
| $n$ | - Sample Size |
| $\bar{x}$ | - Sample Mean |
| $s^2$ | - Sample Variance |
| $\mu$ | - Population Mean |
| $\sigma^2$ | - Population Variance |
| $\alpha$ | - Significance Level |
| $\mu_{d_i}$ | - Population Mean of Percentage Delay |
| W | - Weighting given to each Delay Factor |
| A | - Highest Weight |
| N | - Total number of respondents |

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| GR | - Group Rank |
| GW | - Group Weightage |
| OR | - Overall Rank |
| OW | - Overall Weightage |
| RII | - Relative Importance Index |
| RSI | - Relative Significance Index |