# ECONOMIC IMPORTANCE OF PUBLIC TRANSIT INVESTMENT IN KATHMANDU VALLEY

#### **A Thesis**

Submitted to

The Central Department of Economics

Tribhuvan University, Kirtipur, Kathmandu, Nepal
In Partial Fulfillment of the Requirements
for the Degree of
MASTER OF ARTS
IN
ECONOMICS

Submitted by:

**ALIM KUMAR SHAKYA** 

Roll No.: 41/2070 "A"

Exam Roll No.: 02094

T.U. Regd. No.: 7-2-347-68-2008

**Central Department of Economics** 

Tribhuvan University, Kirtipur, Kathmandu, Nepal

November, 2017

## LETTER OF RECOMMENDATION

This thesis entitled **Economic Importance of Public Transit Investment in Kathmandu Valley** has been prepared by Mr. ALIM KUMAR SHAKYA under my supervision. I hereby, recommend this thesis for examination by the Thesis Committee in a partial fulfillment of the requirement for the Degree of Master of Arts in Economics.

•••••

Dr. Rasmee Rajkarnikar

Thesis Supervisor

June, 2017

#### LETTER OF APPROVAL

This is to certify that the thesis entitled ECONOMIC IMPORTANCE OF PUBLIC TRANSIT INVESTMENT IN KATHMANDU VALLEY, submitted by Mr. ALIM KUMAR SHAKYA to the Central Department of Economics Faculties of Humanities and Social Sciences, Tribhuvan University, in partial fulfillment of the requirements for the degree of Master of Arts has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the degree.

Thesis Committee	
Prof. Dr. Ram Prasad Gyanwaly	
Head of the Department	
••••••	
Dr. Krishna Acharya	
External	
••••••	
Dr. Rasmee Rajkarnikar	
Thesis Supervisor	
Date: June, 2017	

#### **ACKNOWLEDGEMENT**

This thesis entitled "Economic Importance of Public Transit Investment in Kathmandu Valley" has been prepared for partial fulfilment of the requirements for the Degree of Master of Arts in Economics.

I am deeply indebted to my thesis supervisor Dr. Rasmee Rajkarnikar, Central Department of Economics (CEDECON), TU Kirtipur, for her constant encouragement, creative comments and suggestion to bring this thesis in this form. It would not have been possible for me to complete my study without her supervision, advice and direction. I would like to thank head of the department Prof. Dr. Ram Prasad Gyanwaly for his co-operation, suggestion and information.

Similarly, I express my great thanks to all my teachers from Central Department of Economics for their teachings, suggestions, guidance and care to me during my study.

Finally, I thank my friends and families for their strong help and support during my study.

ALIM KUMAR SHAKYA

## TABLE OF CONTENTS

	Page No.
LETTER OF RECOMMENDATION	i
APPROVAL LETTER	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
ACRONYMS/ABBREVIATION	viii
CHAPTER I: INTRODUCTION	1-6
1.1 General Background	1
1.2 Statement of the Problem	4
1.3 Objectives of the Study	4
1.4 Significance of the Study	5
1.5 Limitations of the Study	5
1.6 Organization of the Study	6
CHAPTER II: LITERATURE REVIEW	7-13
2.1 International Context	7
2.2 National Context	11
CHAPTER III: RESEARCH METHODOLOGY	14-17
3.1 Research Description	14
3.2 Study Area	14
3.3 Base Case	14
3.4 Population and Sample	14
3.5 Data Collection Technique	15
3.6 Primary Data Collection	15
3.6.1 Participant Observation	15
3.6.2 Questionnaire Survey	15
3.7 Secondary Data Collection	16
3.8 Data Analysis Technique	16

CHAPTER IV: ECONOMIC IMPORTANCE OF SUSTAINABLE TRANSPORTATION SERVICE IN KATHMANDU	18-37
4.1 Sustainable Investment on Public Transportation	18
4.2 Economic Importance of a Public Transit Investment	19
4.3 The Effect of Sustainable Transit Investment	20
4.4 User Benefits and Costs	21
4.5 Measuring User Costs	23
4.5.1 Transit User Cost	24
4.5.2 Private Vehicle User Cost	24
4.6 Calculating Transit's Benefits	27
4.7 Calculation of Travel Demand Response	34
4.8 Calculating Direct Costs (Capital and Operation)	35
4.9 Discounting and Annualizing Values	36
4.10 Analysis of the Results	37
CHAPTER V: SUMMARY CONCLUSION AND RECOMMENDATIONS	38-40
5.1 Summary of Findings	38
5.2 Conclusion	39
5.3 Recommendations	39
APPENDICES	41-43
REFERENCES	44-45

## LIST OF TABLES

Table No.	Title	Page No.
Table 4.1:	Average Value of Most Incurred Private Vehicles Expenses	25
Table 4.2:	Cost of Owning and Operating Selected Motor Vehicles	26
Table 4.3:	User Cost Calculations – Bus Transit	28
Table 4.4:	User Cost Calculations – Motorbike and Car Traffic	30
Table 4.5:	User Cost for All Models and Times	32
Table 4.6:	Travel Volume by Transportation Mode	33
Table 4.7:	User Benefits – All Time Period, All Modes	34
Table 4.8:	Direct Cost: Capital and Operation	36
Table 4.9:	Benefit – Cost Calculation	37
Table 4.10:	Types of Public Transportation in Kathmandu Valley Roads	43

# LIST OF FIGURES

Figure No.	Title	Page No.
Figure 1.1:	History of Public Transportation Development in Kathmandu Valley	3
Figure 4.1:	Vicious Circle of Car-Oriented Transport Development	19
Figure 4.2:	Cause and Relationship effect of Transit Investment	21
Figure 4.3:	User Benefits from Transit Improvement	22
Figure 4.4:	Outcome of the questionnaire survey	35
Figure 4.5:	Map of area under study	42

#### **ACRONYMS/ABBREVIATION**

ADB = Asian Development Bank

BRT = Bus Rapid Transit

CANN = Clean Air Network Nepal

CBS = Central Bureau of Statistics

GDP = Gross Domestic Product

GNP = Gross National Product

GoN = Government of Nepal

JICA = Japan International Cooperation Agency

KM = Kilometer

KSUTP = Kathmandu Sustainable Urban Transport Project

LRT = Light Rail Transit

MnDOT = Minnesota Department of Transportation

MTPD = Metropolitan Traffic Police Division

NPC = National Planning Commission

NPHC = National Population and Housing Census

NPV = Net Present Value

PDV = Present Discounted Value

PM = Particulate Matter

UN = United Nation

WB = World Bank