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**FACTORS AFFECTING WILLINGNESS TO USE
TRANSFER BASED PUBLIC TRANSPORT NETWORK**

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Degree of Master of Science

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DECLARATION

I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

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The above candidate has carried out research for the PhD/MPhil/Masters thesis/dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Prof. J.M.S.J. Bandara

Signature of the Supervisor:

Date: 25.08.2025

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Pakkiyarajah Saranjan

ABSTRACT

This study examines the primary factors influencing passengers' willingness to use transfer-based urban public transport systems, emphasizing the interplay between service attributes and user demographics. In contrast to direct bus routes, transfer-based networks offer improved coverage and operational efficiency but face barriers such as increased waiting times, inconvenience, and perceived complexity. A multi-stage methodology was employed, combining Multi-Criteria Decision Analysis (MCDA) and a Stated Preference (SP) survey to evaluate passenger priorities and simulate decision-making behavior. The MCDA identified critical service factors as key drivers of user satisfaction. The SP survey further quantified passenger preferences under varying travel characteristics. By utilizing the Mixed Logit Model, the study revealed that reduced waiting times, fewer transfers, accessible information, and competitive fares significantly increase the likelihood of choosing transfer-based options. These preferences were found to be moderated by sociodemographic parameters like age, gender, and frequency of travel, underscoring the necessity for inclusive and user-specific planning techniques. The results underscore how crucial it is to take passenger behavior and preferences into account when designing sustainable and effective transportation systems. The study offers practical insights for policymakers and transit agencies to enhance the attractiveness and functionality of transfer-based networks in rapidly urbanizing environments.

Keywords: Transfers, Human Factors Public Transport, MCDA, Machine Learning, and Numerical Modelling

TABLE OF CONTENTS

Declaration	i
Acknowledgement.....	ii
Abstract	iii
Table of Contents	iv
List of Figures	vi
List of Tables.....	vii
List of Abbreviations.....	viii
LIST OF APPENDICES	ix
Chapter 1	1
1. Introduction	1
Chapter 2	4
2 Literature Review.....	4
2.1 Background	4
2.2 Challenges in Direct bus network	4
2.3 Significance of transfer-based networks	5
2.4 Factors affecting willingness to Choose Transfer based Public Transport Network.....	6
2.5 Multi-Criteria Analysis.....	6
2.6 Adoption on Machine Learning for Numerical Modelling	7
Chapter 3	9
3 Methodology	9
3.1 Introduction	9
3.2 Identified Factors for the Multi Criteria Analysis	10
3.2.1 Factors Influencing user willingness to use Both Direct and Transfer-Based Networks	12
3.2.2 Factors Influencing user willingness to use (Only) Transfer-Based Networks	12
3.3 Data Collection.....	13
3.3.1 Questionnaire Data Collection	13
3.3.2 Factor Importance and Weighting.....	14

3.4	Multi Criteria analysis	15
3.5	Stated Preference Survey.....	16
3.5.1	Factor Selection for SP Survey	16
3.6	Stated Preference Survey Questionnaire	19
3.6.1	Data Preparation.....	22
3.7	Mixed Logit Model (MLM)	23
3.7.1	Machine Learning Algorithm Used	23
Chapter 4	25
4	Results.....	25
4.1	Multi Criteria Analysis Results	25
4.1.1	Factors Affecting Both Direct and Transfer-Based Networks	25
4.1.2	Factors Specific to Transfer-Based Networks	26
4.2	Mixed Logit Model	27
Chapter 5	30
5	Components	30
5.1	Insights from Preliminary Data Collection.....	30
5.2	Insights from Multi Criteria Analysis	32
5.3	Insights from Stated Preference Survey	33
5.4	Insights from Numerical Modelling.....	33
Chapter 6	37
6	Conclusion	37
6.1	Key Findings Overview.....	37
6.2	Practical Implications for Transport Planning.....	38
6.3	Limitations and Recommendations	38
6.4	Implementation Feasibility and Institutional Considerations.....	38
6.5	Final Remarks.....	39
7	References	40
Appendix – Preliminary Survey Questionnaire Samples	43
Appendix – Stated Preference Survey Samples	46	

LIST OF FIGURES

Figure 3.1: Main stages of the methodology.....	9
Figure 3.2: Screenshots of Online Questionnaire Form.....	14
Figure 3.3: Likert Scale used for getting the preferences of the Users for Each Factors Under Two Categorization.....	15
Figure 3.4: Questions for General Information in SP Survey Questionnaire	21
Figure 3.5: Scenarios for Stated Preference Survey.....	22
Figure 5.1: Pie Chart of Age wise Respondents in Preliminary Data Collection	30
Figure 5.2: Pie Chart of Gender wise Respondents in Preliminary Data Collection .	31
Figure 5.3: Pie Chart of Respondents Satisfaction of Direct busses.....	31
Figure 5.4: Pie Chart of Access to the Nearest Public Transport Route of Respondents	31
Figure 5.5: Pie Chart of Preference in Direct vs Transfers of Respondents	32
Figure 5.6: Clustered Bar Chart of Coefficients	34

LIST OF TABLES

Table 3.1: Identified Factors and Relevant Studies	11
Table 3.2: Factors Affecting Both Direct and Transfer-Based Networks.....	12
Table 3.3: Factors Affecting only Transfer related Factors	13
Table 3.4: Normalized Weightages of Factors Affecting Both Direct and Transfer-Based Networks	17
Table 3.5: Normalized Weightages of Factors Affecting only Transfer-Based Networks	17
Table 3.6: Initial selected factors for SP survey	18
Table 3.7: Factors and their levels for the options	21
Table 4.1: Analysis of Factors Affecting Both Direct and Transfer	25
Table 4.2: Analysis of Factors Affecting only Transfer Related	26
Table 4.3: Estimated coefficients (β_n) for the numerical model.....	27

LIST OF ABBREVIATIONS

Abbreviation	Description
AHP	Analytic Hierarchy Process
CBA	Cost-Benefit Analysis
CL	Conditional Logit
LL	Log-Likelihood
MCA	Multi-Criteria Analysis
MCDA	Multi Criteria Decision Analysis
MLM	Mixed Logit Model
MNL	Multinomial Logit
NL	Nested Logit
PT	Public Transport
SMLE	Simulated Maximum Likelihood Estimation
SP	Stated Preference

LIST OF APPENDICES

Appendix	Description	Page
Appendix - I	Preliminary Survey Questionnaire Samples	43
Appendix - II	Stated Preference Survey Samples	46