
CONTENTS

APPROVAL	ii
SELF DECLARATION AGAINST PLAGIARISM	iii
ABSTRACT	iv
ABSTRAK	v
DEDICATION	vi
ACKNOWLEDGMENTS	vii
PREFACE	viii
CONTENTS	ix
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF TERMS	xiv
LIST OF NOTATIONS	xv
1 Introduction	1
1.1 Rationale	1
1.2 Theoretical Framework	2
1.2.1 Transportation Planning Theory	2
1.2.2 Forecasting Theory	2
1.3 Conceptual Framework/Paradigm	3
1.3.1 Forecasting Paradigm	3
1.3.2 Recommendation Paradigm	3
1.4 Statement of the Problem	3
1.5 Research Questions	4
1.6 Objectives and Hypotheses	5
1.6.1 Objectives	5
1.6.2 Hypotheses	5
1.7 Assumption	5
1.8 Scope and Delimitation	6
1.9 Significance of the Study	6

2	Review of Literature and Studies	8
2.1	Theoretical Foundations	8
2.1.1	Time Series Forecasting	8
2.1.2	Model Benchmarking and Comparison	8
2.1.3	Transportation Demand Modeling	9
2.2	Related Literatures	9
2.2.1	Public Transportation Challenges	9
2.2.2	Time Series Forecasting in Transportation	10
2.2.3	Optimization in Public Transportation	10
2.2.4	Transportation Optimization	10
2.2.5	Literature on Jakarta's Public Transportation	10
2.3	Related Studies	11
2.3.1	Studies on Predictive Modeling for Public Transportation	11
2.3.2	Studies on Real-Time Data Utilization	11
2.3.3	Studies on Transportation Optimization	12
2.3.4	Optimization Studies in Public Transportation	12
2.4	Policy Recommendations Based on Predictive Accuracy	12
2.4.1	Implications	12
3	Research Methodology	13
3.1	Research Design	13
3.1.1	Passenger Load Calculation	14
3.1.2	ARIMA Models	15
3.1.3	Automatic ARIMA Model	16
3.1.4	Performance Evaluation	18
3.2	Population/Sampling	19
3.2.1	Dataset	19
3.2.2	Data Preprocessing	19
3.3	Instrumentation and Data Collection	23
3.3.1	Data Collection Tools	23
3.3.2	Data Collection Process	24
3.3.3	Data Cleaning Process	24
4	PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA	25
4.1	Presentation of Data	25
4.1.1	Analysis of Passenger Traffic Data	25
4.1.2	Daily Passenger Load Prediction	26
4.1.3	Daily KRL Load Prediction	28
4.2	Analysis of Data	29
4.2.1	Time Series Forecasting	29

4.2.2	Daily Passenger Load Prediction	29
4.2.3	Daily KRL Load Prediction	30
4.2.4	Train Trips Needs Calculation	30
4.2.5	Passenger Load Calculation	30
4.3	Interpretation of Data	31
4.3.1	Implications for Scheduling	31
4.3.2	Implications for Infrastructure Development	31
4.3.3	Implications for Policy Making	31
4.4	Summary of Findings	32
5	CONCLUSION AND RECOMMENDATIONS	33
5.1	Conclusions	33
5.1.1	Summary of key Findings	34
5.1.2	Validity Period of ARIMA Forecasts	35
5.1.3	General Conclusions	36
5.2	Recommendations	36
5.2.1	Recommendations for Transportation Management	37
5.2.2	Recommendation for Policy Makers	37
5.2.3	Suggestions for Further Studies	37
	BIBLIOGRAPHY	38