

TABLE OF CONTENTS

APPROVAL PAGE	1
SELF DECLARATION AGAINST PLAGIARISM	2
ABSTRACT.....	3
PREFACE.....	4
ACKNOWLEDGMENTS	5
TABLE OF CONTENTS	6
LIST OF FIGURES	10
LIST OF TABLES	11
LIST OF ABBREVIATION.....	13
CHAPTER 1 INTRODUCTION	14
1.1 Background	14
1.2 Problem Identification.....	16
1.3 Objective	16
1.4 Assumption and Problem Limitation.....	17
1.5 Research Methodology	17
1.6 Hypotheses	18
CHAPTER 2 STUDY OF LITERATURE.....	19
2.1 Evolution of Mobile Communication Standard.....	19
2.2 Long Term Evolution (LTE)	21
2.3 Licensed Assisted Access (LAA)	22
2.3.1 Features	22
2.3.2 Architecture.....	23
2.3.3 Technical Parameters	23
2.4 Existing LAA Implementation	24
2.4.1 Overseas	24
2.4.2 Indonesia	25
2.5 Existing LAA regulation	25
2.5.1 Indonesia LAA Existing Regulation	25

2.5.2	LAA Frequency Regulation Benchmark.....	27
2.6	Network Planning.....	29
2.6.1	Capacity Planning.....	29
2.6.2	Coverage Planning.....	32
2.6.2.1	Link Budget.....	33
2.6.2.2	Propagation Model.....	34
2.7	Cost-Benefit Analysis.....	34
CHAPTER 3 METHODOLOGY AND SCENARIO		38
3.1	Framework Research.....	38
3.2	Input Information Processing.....	38
3.2.1	Network Technology.....	38
3.2.2	Market Information.....	39
3.2.3	Related Regulation.....	40
3.3	Technical Analysis.....	40
3.3.1	Capacity Analysis.....	40
3.3.2	Coverage Analysis.....	41
3.4	Cost-Revenue Structure.....	42
3.5	Economic Analysis.....	44
3.6	Regulation Analysis.....	44
3.7	Final Result.....	44
CHAPTER 4 TECHNO-ECONOMIC ANALYSIS OF LICENSED ASSISTED ACCESS TECHNOLOGY.....		45
4.1	Technical Analysis.....	45
4.1.1	Capacity Analysis.....	45
4.1.1.1	Total Network Throughput.....	45
4.1.1.2	Single Site Capacity Dimensioning.....	49
4.1.1.3	The capacity of Existing LTE.....	49
4.1.1.4	Analysis Result.....	50
4.1.2	Coverage Analysis.....	52
4.1.2.1	Maximum Allowable Path Loss (MAPL) Calculation.....	53
4.1.2.2	Cell radius and Cell area Calculation.....	54
4.1.2.3	Hotspot Determination.....	56

4.1.2.4	Analysis Result	56
4.1.2.5	Coverage Prediction.....	57
4.2	Economic Analysis.....	59
4.2.1	Business Canvas Model	59
4.2.2	Cost-Revenue Structure	60
4.2.2.1	Cost	60
4.2.2.2	Revenue.....	61
4.2.3	Feasibility Analysis.....	62
4.2.3.1	Business Feasibility Assumption	62
4.2.3.2	Net Present Value.....	62
4.2.3.3	Internal Rate of Return.....	64
4.2.3.4	Payback Period.....	64
4.2.3.5	Profitability Index	66
4.2.4	Sensitivity Analysis.....	66
4.2.4.1	Sensitivity Parameter and Its Assumption	66
4.2.4.2	Sensitivity Scenario and Impact to Business Feasibility.....	67
4.2.4.3	Sensitivity Result #1: Ratio of LAA-enable Device Penetration	68
4.2.4.4	Sensitivity Result #2: Growth of LAA Device	70
4.2.4.5	Sensitivity Result #3: ARPU.....	71
4.2.4.6	Sensitivity Result #4 : Equipment (LAA site) Cost	71
4.2.4.7	Sensitivity Result #5: O&M Cost	71
4.2.4.8	Sensitivity Result #6: Marketing Cost	72
4.2.4.9	Sensitivity Result #7: Interest Rate.....	72
4.3	Regulatory Analysis	72
4.3.1	Spectrum Management Regulation Analysis	73
4.3.2	Standardization Regulation Analysis	74
4.3.3	Telecommunication Operating License Regulation Analysis	75
CHAPTER 5 CONCLUSION AND RECOMMENDATION.....		76
5.1	Conclusion.....	76
5.2	Recommendation.....	78
5.3	Future Work	78
BIBLIOGRAPHY		79

APPENDIX A..... 82
APPENDIX B..... 85