

# TABLE OF CONTENTS

<b>APPROVAL PAGE .....</b>	<b>i</b>
<b>ABSTRACT .....</b>	<b>ii</b>
<b>DEDICATION .....</b>	<b>iii</b>
<b>SELF DECLARATION AGAINST PLAGIARISM .....</b>	<b>iv</b>
<b>PREFACE.....</b>	<b>v</b>
<b>TABLE OF CONTENTS.....</b>	<b>vi</b>
<b>LIST OF TABLES.....</b>	<b>viii</b>
<b>LIST OF FIGURES.....</b>	<b>ix</b>
<b>CHAPTER 1 .....</b>	<b>1</b>
<b>INTRODUCTION .....</b>	<b>1</b>
<b>1.1. Background.....</b>	<b>1</b>
<b>1.2. Gap of The Real Condition and The Future .....</b>	<b>4</b>
<b>1.3. Problem Defenition.....</b>	<b>5</b>
<b>1.4. Problem Limitations.....</b>	<b>7</b>
<b>1.5. Research Objectives .....</b>	<b>7</b>
<b>1.6. Hypotheses .....</b>	<b>8</b>
<b>1.7. Scope of Work.....</b>	<b>9</b>
<b>1.8. Writing Organization.....</b>	<b>9</b>
<b>CHAPTER 2 .....</b>	<b>10</b>
<b>VEHICULAR AD-HOC NETWORKS, LONG TERM EVOLUTION, MOBILITY</b>	
<b>MODELS AND RELATED WORKS.....</b>	<b>10</b>
<b>2.1. Vehicular Ad Hoc Networks (VANET) .....</b>	<b>10</b>
<b>2.2. VANET Applications and Requirements .....</b>	<b>11</b>
<b>2.3. Long Term Evolution (LTE) .....</b>	<b>12</b>
<b>2.4. Mobility Models.....</b>	<b>15</b>
<b>2.2.1. Random Waypoint Mobility Model .....</b>	<b>16</b>
<b>2.2.2. Gauss-Markov Mobility Model .....</b>	<b>17</b>
<b>2.5. Correlation Coefficient .....</b>	<b>20</b>
<b>2.6. AODV Routing Protocol.....</b>	<b>21</b>
<b>2.5.1. Route/Path Discovery .....</b>	<b>22</b>
<b>2.5.2. Route Table Management .....</b>	<b>22</b>
<b>2.5.3. Route Maintenance .....</b>	<b>23</b>
<b>2.7. Related Works .....</b>	<b>23</b>
<b>CHAPTER 3 .....</b>	<b>28</b>
<b>GAUSS-MARKOV MOBILITY MODEL SIMULATION ON PURE VANET AND HYBRID</b>	
<b>LTE-VEHICULAR AD-HOC NETWORK.....</b>	<b>28</b>
<b>3.1. General Subscription .....</b>	<b>28</b>

3.2.	Simulation Procedure.....	28
3.3.	Scenarios .....	29
3.3.1.	Pure VANET Topology .....	29
3.3.2.	LTE-VANET Topology .....	30
3.3.3.	Correlation Coefficient.....	31
3.4.	Flow Chart .....	32
<b>CHAPTER 4 .....</b>		<b>34</b>
<b>SIMULATION PROCESS AND OUTCOME ANALYSIS.....</b>		<b>34</b>
4.1.	Simulation .....	34
4.1.1.	Research Scenario.....	34
4.1.2.	Network Model .....	36
4.1.3.	MNs movement on Random Waypoint and Gauss-Markov Mobility Model... 37	
4.1.4.	Variables.....	38
4.2.	Data Analysis .....	39
4.2.1.	Simulation Result for the pure VANET Simulation Scenario.....	39
4.2.1.1.	Simulation Result for Packet Delivery Ratio .....	39
4.2.1.2.	Simulation Result for Throughput .....	41
4.2.1.3.	Simulation Result for Delay.....	43
4.2.1.4.	Correlation Coefficient Analysis.....	44
4.2.2.	Simulation Result for the LTE-VANET Simulation Scenario .....	47
4.2.3.	Result Comparison between pure VANET and LTE-VANET Simulation Scenario .....	54
4.2.4.	Discussion .....	55
<b>CHAPTER 5 .....</b>		<b>57</b>
<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>		<b>57</b>
5.1.	Conclusions .....	57
5.2.	Recommendations .....	58
<b>REFERENCES .....</b>		<b>59</b>