ACKNOWLEDGMENT

First and foremost I offer my sincerest gratitude to my supervisor, Dr K.M.Lakshaman rao, Head and professor Dept of transportation engineering JNTUH Hyderabad under whose supervision I chose this topic and began the research work. They supported me throughout my research with their patience and knowledge whilst allowing me to work in my own way. I attribute the level of my PhD degree to their encouragement and effort and without whom this thesis, too, would not have been completed or written.

I express my sincere thanks to Dr Arti Khaparde, Dean and Prof in ECE Dept, Tirumala Engineering College for helping me and for extending her valuable support and encouragement during the course of the thesis.

I wish to place on record my gratitude to Dr.C.Dayanad Principal, Tirumala engineering college for extending his valuable support and encouragement during the course of the thesis.

I would like owe my debt to Director Tirumala engineering college Dr K Subbatathnamaiah, who always extended help and wishes, so that my goal can be achieved.

I wish to place on record my gratitude to A.Sreelatha, Research associate JNTUH for helping me during the course of the thesis.

I am thankful to my Father Late Sathaiah and Mother Radhamma who instilled their passion for knowledge and values along with their motivation to see me excel in every aspect of life.
Feeling gratitude and not expressing it is like wrapping a present and not giving it. Hence I cannot end without thanking my spouse Mrs Sreelatha and daughters Shivani and Deekshitha, on whose constant encouragement, love, keen interest and moral support, their creativity, assistance and patience truly helped me to complete this thesis in all aspects and Finally, I would like to thank all who’s direct and indirect support helped me to complete my thesis.

A.MAHESH BABU