CHAPTER 1
INTRODUCTION

1.1 PROJECT INTRODUCTION

A bus comprising: a chassis supported on front and rear wheels and including a box frame for supporting construction of a body; and a body constructed from a plurality of standardized body modules on the box frame, the standardized body modules being selected from a plurality of types of standardized body modules; the types of standardized body modules including an overwheel module type with the body including a first overwheel module positioned longitudinally along the chassis over the rear wheels, and, in a non-conventional bus, including a second overwheel module positioned longitudinally along the chassis over the front wheels; and the types of standardized body module types further including multipositional standardized body module types each of which are positionable at more than one longitudinal location along the chassis, excluding over wheel locations, in one or more iterations, the types of multipositional standardized body modules including, first and second seating bay module types with the first seating bay module type having half again the longitudinal length of the second seating bay module type, an auxiliary door module type, and a side well door module type; the body including one or more modules selected from the multipositional standardized body types; and a selected one from a set of standard front end closures including a first for conventionally configured busses, a second for rear engine busses and a third for front engine busses positioned to enclose the body at its front end.
Also, bus structures are very important especially to increase the safety of the bus. For that, bus body panel joints need to be sufficiently strong to prevent them from separating during a crash and becoming cutting edges that could cause serious injuries or allow passenger ejection through openings. It is important that each large bus body panel joint be capable of holding the body panel to the member to which it is joined, when subjected to a force of 60 percent of the tensile strength of the weakest joined body panel component. These requirements apply to most joints located in the "bus body" which is the portion of the bus that encloses the occupant space, starting at the most forward point of the windshield. Excluded from these requirements are doors, windows, body panels designed for ventilation or other functional purposes, and maintenance access panels.

1.2 PROBLEM STATEMENT

This project are basically about to improved the bus safety condition at Malaysia. As we all know, there a little amount of literature was found related to the safety rule for the bus in Malaysia and according to ‘BERNAMA’ it just being used to Malaysia from 2004 and were followed by primary bus company. The R66 ECE are just being introduced to other bus company in 21 August 2007 after an express bus accident in Bukit Gantang on 13 August 2007 which killed 23 people (Utusan Malaysia, 2008). The problem now are related to the small company that do not understand the important of this rule and were try to refuse it. Also, with the correct design of bus roof structures, deaths and injuries due to the crushing of the roof into the occupant compartment in rollover crashes can be reduce.
1.3 PROJECT OBJECTIVE AND SCOPE OF STUDY

The main objective in this project is to investigate the bus structure used in Malaysia related to bus design and safety aspect that can be considered and apply. Secondly, in this project its objective also to analyze and the bus structure on a portion of the bus roof top using finite element analysis software that is Algor. For that this project consist the study of the structure suitability, redesign it and confirm the design with CAE. Then, it will be to relate that portion studies with all other portion of bus structure.

In this project, firstly the research objectives are evaluated to identify the important part that needs to be study for this project. After that, all the research study source about bus safety precaution and analysis from recent and current test were collected from journal that were get from library and internet. Then, all the suitable data and information that were collected from the journal and previous research were stated in literature review as for this project references. The methods that need to be used in this project were also developed as the guide for the workflow of this project. The focus of this work is on occupant protection in several types of buses and coaches in both the scheduled and nonscheduled transportation. For this purpose the connection between the occurrences at the real world accident scenes and the theory are compared. The simple reason for that approach was the important feedback and usable knowledge of the accident incidents and their influence to improve current test procedures. Therefore an investigation was conducted on a number of topics including statistical collision data analysis, development of a bus accident database, reconstruction of real world accidents by means of an accident reconstruction software, component testing, full scale bay section testing, development of numerical simulation models for vehicle structure and occupant behavior, parameter studies on occupant size influence, detection of injury mechanisms, cost benefit analyses for different test methods and finally the suggestion for improvements of current testing practices. Other than that, the other important part that were study in this project are about the bus roof top design analysis and how that component were combined and built to the bus body. This will be included in as one of the outcome for this project.