8. CONCLUSION

This thesis analysed an existing data set to determine the street characteristics for sustainable layout and combined the result into multi-objective optimization model for road layout. Fuzzy logic model to estimate traveller’s perception of sustainable layout where developed in the pursuit of complete road layout tool.

The fuzzy logic model developed for the transport management, safety management, energy management, environmental management showed that the number of through lanes, the posted speed limit and the width of the sidewalk and bike lane respectively. These characteristic are among the most highly correlated street characteristic for sustainable road layout.

When compared to the existing regression analysis model, the fuzzy logic modelling techniques was determined to be more powerful and accessible model to determine the sustainable road layout design. This techniques provides partitions with the distribution of sustainable rating and there model require fewer number of variables that are easily accessible.

The various indicators of sustainable road layout where incorporated into the proposed fuzzy logic multi-object optimization model. The objective function of the model was to balance the probabilities of sustainable ratings, constrained by a series of factors, and to prevent them from falling below the minimum probability calculated. The objective function was subjected to decision variables and constants selected from the data used and from the standards. The constraint that brought the street
characteristics for the three modes together was the ROW width. This constant compared a given ROW width value with an equation for ROW width containing the values the street characterstics. The scenarios showed that fuzzy logic model provides information about sustainable design satisfaction with different street design.

The fuzzy logic multi-objective optimization model surpassed the previously created model by including four travel modes simultaniouedy into one optimization model.

It has been designed using readily available software (math lab) thus creating a scholastic interface that allows easy manipulation of the components. However, the model can be further designed into a user-friendly interface that, when given to a designer, would allow to simple operation of inserting the given ROW width in a cell and a function button would be clicked for the model to start the iteration process. The final results would be the values for the street charatersists included in the design for street segment. The complete street design will accommodated LMV, HMV, pedestrian, bicycle, two wheelers with the same ROW while achieving an sustainable layout level determine by the designer.

The objectives this thesis was to design fuzzy logic model for sustainable road layout design which has been accomplished and demonstrated in this document.