CHAPTER 7
Conclusion and Scope for Future Research

7.0 Summary of the work

Traffic Management system (TMS) comprises four major sub systems: The Network Database Management system for information to the passengers, Transit Facility Management System for service, planning, and scheduling vehicle and crews, Congestion Management System for traffic forecasting and planning, Safety Management System concerned with safety aspects of passengers and Environment.

The Network Database Management system provides the bases of the network models that will be used in the urban motorway control centres and in the travel and traffic information systems. It will also provide a basis for storing and analysing the strategic information related to traffic. It provides wide spectrum of data which can be used by various government agencies.

The Transit Facility management describes the philosophy underlying the design of the system and the broad outlines of the intelligent interactive scheduling methods for administrative purpose. The best results are obtained with the power of mathematical techniques and computer technology, which permits a kind of higher level interaction between man and machine as an intelligent - interactive system.

The Congestion Management System deals with traffic flow. Statistical count distributions are used to estimate flow condition. Artificial neural network methods were established to create intelligent support systems for traffic monitoring and pattern recognition. Queuing analysis and centrally co-ordinated signal control system models have been discussed to estimate the severity of the congestion.
The Safety Management system highlights the importance safety of the passengers. Mathematical models for pollution control and forecast accident fatality rate have been developed.

This work has opened a rather wide frame work of model structures for application on traffic. The facets of these theories are so wide that it seems impossible to present all necessary models in this work. However it could be deduced from the study that the best Traffic Management System is that which

- is realistic in all aspects
- is easy to understand
- is easy to apply

As it is practically difficult to device an ideal fool-proof model, the attempt here has been to make some progress in that direction.

7.1 Future Development

Further developments in hardware will yield no fundamental alternation in the not-too-distance future, while the cost to performance ratio will become ever more profitable. Out of this an increasing use of computers will result. Most emphasis will be on user friendly interfaces, data management systems and computer networks. Certainly, conceptual improvements will be established in the software field. One main factor will be the complete inclusion of relational database systems. Not only does this consideration relate to the application and further development of isolated program systems, but the database system will acquire great importance as a connecting link between different packages for computer aided planning. However the data model may produce structures which will cause performance problems in certain planning phases.

Another essential aspect will be the further development of operational research and management science algorithms. This will be true for discrete as well as for probabilistic solution procedures.
Artificial intelligence, although not highly developed at present will be used in practice for different applications in the near future. Nevertheless the exceptions from the techniques should not be set too highly, certainly artificial intelligence systems will remain only as helpful devices used by the planning staff. Probably artificial intelligence procedures will be used mainly in two fields.

Computer-aided analysis and decision support systems.

Modelling processes

However, these techniques will not be able to replace the advantages of optimisation techniques.

7.2 Conclusion

Looking at the present situation further developments in computer-aided systems need no longer be the subject of financial restrictions in procuring hardware. In many cases lack of information among potential users prevents computer-aided systems from being applied. At the same time there are tendencies to reject such systems for ideological reasons.

Therefore practical applications have to be prepared very carefully. This involves training of the planning staff as well as the acquisition of information and further education of different management levels. Furthermore there are financial burdens which result from parallel working during the transition from manual working to Traffic Management System.

In spite of additional expenditure, which will be limited to a specific time period, no mass transit company will be able to reject Traffic Management System in the medium or long term.