

MATHEMATICAL MODELLING OF TRANSPORTATION PROBLEMS: MANAGERIAL PERSPECTIVES WITH SPECIAL REFERENCE TO DELHI

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Transportation is the need of the day, both in the rural as well as in the urban part of any country. The existing land use pattern as accepted by the transport management gives rise to the traffic congestion problem of any large city. Delhi, therefore, is no exception to this problem. The city of Delhi, like other cities of developing countries is currently facing an acute transport management problem. This primary transport management problem leads to many more secondary problems such as traffic congestion, air pollution, high-energy consumption, and loss of productivity, increase in accidental death rates and above all the vehicular parking problem.

The problem of Transportation and problems due to Transportation are an issue of great concern not only for the authorities but also for the citizens. In order to improve the situation, it is necessary that the existing system is continuously upgraded and stringent laws are implemented to reduce vehicular congestion and pollution in the city. This is the basic objective of this thesis.

In order to meet the objectives, primary and secondary data based on structured questionnaires has been collected. Interviews were held with respondents to get a feedback from the general public in improving the transport system of the city. This data has been then mathematically and statistically analyzed for drawing conclusions.

The mathematical and statistical techniques provide a numerical recipe for the investigation procedure. But, the most important task is to draw conclusions based on the results obtained from mathematical computations. The viewpoints of the respondents as expressed by them in the questionnaires and the conclusions of the results have been projected at the end of each chapter of the thesis. On the basis of the analysis made, the remedial measures have been evolved in the context of the Transportation and its related problems. Since each chapter of the thesis deals with a different problem related to transportation, the remedial measures for each problem have been discussed at the end of each chapter. Though the work done is complete and

exhaustive in its own perspective, still future prospects of the study cannot be ruled out. At the end of each chapter, future prospects related to the study made in the chapter have been discussed. The conclusions or the remedial measures proposed are not very difficult to achieve. It is only a matter of policy decision and policy implementation that has to be taken up seriously by the concerned authorities. Delhi is a proud capital of a democratic republic and every citizen of the city has a right to breathe fresh clean air, to live in a pollution free environment and to commute on decongested roads. It is not a dream that cannot be made true. We, as enlightened citizens of the city have to work united in this direction. With this vision and mission, the recommendations of the study have been projected in the thesis.

The thesis has been divided into five chapters.

In Chapter 1 entitled, "*Introduction*", a brief introduction to the Transport system including a history of the studies made in this system have been discussed. The various mathematical and statistical techniques that have been used in the thesis are also discussed.

Chapter 2 is entitled, "*Car Parking: Managerial Perspectives*". This chapter has been designed with the aim of highlighting the significance and need of parking facilities in residential colonies of metropolitan cities.

In Chapter 3 entitled, "*Residents Welfare Associations: A Futuristic Approach to Reduce Vehicular Density*", the need for a policy approach of the Government sector working hand in hand with the citizens has been projected.

Chapter 4 is entitled, "*School Transport System: An Environment and Energy Efficient Approach*". The study in this chapter highlights the need for a policy approach of the Government sector to provide a uniform framework of the facilities in the education system to every child. The study lays an emphasis on the fact that such a framework would lead to a reduction in the vehicular density on the roads and a fall in the pollution level.

In Chapter 5 entitled, "*Data Envelopment Analysis: An Application in the Transport Sector*" the application of a technique developed by Charnes, Cooper and Rhodes called as Data Envelopment Analysis has been used to evaluate the efficiencies of State Transport Undertakings with special reference to Delhi Transport Corporation.