SALIENT FEATURES OF EDETUSS AND APPLICATIONS
CHAPTER 6

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6.0 GENERAL

Chapters 4 and 5 have described the estimation of spatial and temporal travel demands through link volume philosophy. A computer package called EDETUSS has been drawn up specially for incorporation of urban structure specification and supply accessibility of the transportation system. The objective of this chapter is to further explore the possible uses of this package to real life problems.

6.1 SALIENT FEATURES OF EDETUSS

There are two distinct series of EDETUSS which have been developed. In EDETUSS 1, the emphasis is on the development of travel demand taking into account the distribution of various activities in the study area and their ability to generate trip attractions. These trip attraction virtues of the various zones are supplied as input in the form of travel time factor functions. This distribution, along with other specifications, like total trips attracted, operational ranges of the different activity systems, classification of zones into activity and non-activity etc. are the ones which specify the urban structure.
The EDETUSS 3 series, on the other hand, over and above the urban structure description, takes into account the accessibility provided by the transportation system also. The accessibility has been defined as a function directly proportional to the frequency of buses and the number of stops in a zone and inversely proportional to the area of the zone. Once accessibilities are calibrated, it is possible to estimate the travel demand that are generated (perhaps conditioned) by the transportation system.

The output of EDETUSS family of models is the spatial travel demand with and without the effect of the present day transportation system supply. The objective further is to demonstrate how these packages can be used for managerial decision making.

6.2 PROPOSED APPLICATIONS

By the nature of EDETUSS, it appears that the package can be made use of for certain managerial decision making. Even though some of these suggestions are still in their formative stages, a broad vision of the possible applications has been presented for posterity. A few of these applications are in

i) Scheduling

ii) route rationalization

iii) planning of comprehensive transportation system

iv) siting of new terminii etc.
6.2.1 Scheduling

Scheduling can be done only based on a heuristic basis. A knowledgeable depot manager can decide on a bus despatch policy based on his experience. Using the no. of buses as the starting point, EDETUSS 3 can be operated to obtain the spatial travel demand. With these travel demands, and the concept of marginal ridership as proposed by Hsu and Surti (1975), a set of frequency schedules can be worked out. A flowchart for the determination of marginal ridership and frequency schedule for a specified number of fleet is shown in Fig. 6.1.

Using these fleet schedules, on various routes, EDETUSS 3 is operated successively to obtain the travel demand. This demand is once again made use of for re-estimating the fleet allotment. This process can be operated recursively so that the differences between successive iterations are marginal. However, the ultimate convergence has to be tested in real life situations.

6.2.2 Route rationalization

It is the common experience in route operation and management in many cities around the world, that the depot managers seldom experiment with alterations to the existing route system for the fear of losing the patronage; even when the changes in the city structure really warrant those adjustments. It is in this scenario that the EDETUSS has a good potential for the management concerns to experiment with alterations to the route structure. Since the travel
Fig. 6.1 FLOWCHART OF SUBROUTINE RIDER
demand in EDETUSS is sensitive to supply accessibility, alternative route patterns can be generated and frequency schedules adjusted so that travel demands between successive adjustments do not alter much. However, the sensitiveness of the EDETUSS for such kind of experimentation has to be once again established in real life.

6.2.3 Planning for comprehensive transportation system

In spite of the route rationalization, alterations to the frequency, schedule etc., it may not be possible in many of the cities of the developing nations to fully satisfy the total travel demand generated by the public transportation system alone. The spill-over in the demand will have to be taken care of by paratransit systems such as autorikshaws, cycle rikshaws, tempos, jeeps etc. The demand for such kind of vehicle can be established by the use of EDETUSS through deduction logic. EDETUSS can estimate the satisfied travel demands for a set of route structure specifications. If this route structure cannot be altered due to various considerations, then the unsatisfied demand can be worked out, if the ultimate travel demand can be obtained. Once again the EDETUSS will be useful for the determination of the ideal or ultimate demand. Assuming most comfortable frequency schedules (say, not more than 15 minutes waiting time at any bus stop), the generated demand can be obtained. Thus, EDETUSS will have double role to play.
6.2.4 Siting of new terminus

EDETUSS provides total trip productions and attractions in various zones of the study area. Zones with very high production and high attractions qualify for the choice of new bus terminii, though there may be many other considerations for this problem.

6.3 CONCLUSIONS

EDETUSS is a simple package calling for data mostly available through secondary sources. Management concerns can make use of their heuristic knowledge for arriving at frequency schedules, rationalization of routes and siting of new terminii. The city can establish the unsatisfied demand in public transport operation and possibly assess the demand for alternate forms of transportation system.