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TOPIC: ASSIGNMENT

QUESTION: when a transportation engineer is considering traffic flows, there are considerations such as principles of demand modeling, land use models, trip generations, modal split and traffic assignment. Discuss these considerations and their effect when forecasting future traffic flows.

ANSWER:

Traffic flow forecasting can be determined of forecast based on some parameters. Generally these parameters are categorized according to the steps involved in the traditional four-stage transport planning process. These parameters include: (a) trip generation, (b) trip distribution, (c) modal split (or mode choice), and (d) traffic assignment.

(a)TRIP GENERATION

Trip generation from and attraction to specific origin-destination (or production- attraction) traffic zones in which the study area is partitioned are based on the socio- economic, demographic and land use characteristics of each zone. Most of the trip generation studies employ econometric and, at a lesser extent, time series analysis techniques. The econometric models use linear or log-linear regression analysis to estimate the relationship between transport demand and its determinants.

(b) TRIP DISTRIBUTION

Trip distribution refers to the allocation of the trip demand among traffic origin- destination pairs, according to the distance or some other trip cost (impedance) function designating the (time, monetary or generalized) cost between zone pairs. The result of this step is the construction of a complete origin-destination table.

(c) MODE CHOICE

Mode choice implies the modal split of the trip demand for the available means of transport along the origin-destination pairs. This step typically considers the distinction between private and public transport (both vehicular and railroad) traffic.

(d) TRAFFIC ASSIGNMENT

The traffic assignment process maps the predicted trip demand per mode into the transport network paths and constituent links, based on the prevailing supply conditions. The solution of the capacity-restrained traffic assignment problem is equivalent with that of Nash equilibrium in game theory. Specifically, according to the first principle of Wardrop (1952), an equilibrium state is reached in the transport network when all users choose paths so that experience the least travel cost and no bilateral change of route can be further made to reduce path travel cost.

 The forecasting of traffic flow depends on having accurate data from the above parameters of the traffic. It is also important that an accurate estimate of the traffic generating characteristics of a new development is known so that its impact can be gauged and the development properly assessed. In general, planning is based on the traffic expected in 20 years from the opening of the facility but it might be necessary to obtain predictions for a series of years to determine the potential for staging of the required works. Heavy-duty pavements are often designed using a design life of 40 years meaning an estimate of the traffic use over that period is required.

The accurate forecasting of a traffic volume in 20 years, or other specified times in the future, might require specialist skills and special studies to be undertaken.

Traffic generated by specific developments can be estimated from industry norms determined from experience