This report briefly summarizes a simplified method for relating zonal dwelling-unit (DU) and zonal parking-stall (Pk-stall) data to trip generation. This DU-Pk-stall method has been used successfully by the Kansas Department of Transportation (KDOT) in studies in El Dorado, Dodge City, and Arkansas City. The results have proved surprisingly accurate in simulating existing conditions in small cities in Kansas and have required a minimum amount of time and money for data collection and tabulation.

The information required for this method of internal trip generation is a DU survey and a Pk-stall survey. The DU information (DUs per zone) is summarized by using census information and used to determine internal trip productions. The Pk-stall survey is taken in the base year for parking lots and on- and off-street parking locations and shows the number of parking stalls per zone, the turnover, and the percentage occupancy. The location information is gathered by driving around the city and counting the number of parking stalls in each internal zone. The number of turnovers is determined by consulting the commercial parking lot owners and manufacturing personnel or by conferring with a knowledgeable local resident. This information is used to determine internal trip attractions. The three internal trip purposes used are (a) DU to DU, (b) Pk stall to Pk stall, and (c) DU to Pk stall. To determine the productions (Ps) for each internal zone, the DUs for each zone are multiplied by factors representing trips per DU. The number of trips per DU assigned for a particular zone depends on where the zone is located within the study area. In the network-calibration phase, these factors can be adjusted as necessary. The Ps per zone are summed to give the total number of Ps in the study area. This total number of internal Ps is later used as a control total in a factoring process to determine the number of attractions (A's) per zone.

The number of A's per zone is determined from the Pk-stall information. Basically, the number of Pk stalls is multiplied by their corresponding daily turnover rates to determine their daily Pk-stall A's. These Pk-stall A's are tabulated on a zonal basis to determine the number of A's per zone. The A's per zone are then summed to give the total number of A's in the study area. The total number of A's in the study area is not equal to the total number of Ps. The number of A's per zone is factored by using the ratio of total Ps to total A's so that the total number of A's equals the total number of Ps. Thus, at this point, the number of Ps and A's for each zone has been determined, and the total number of Ps equals the total number of A's.

The next step in the trip-generation process is to split the Ps and the A's by purpose. Three trip purposes are used (Du to Pk stall, DU to DU, and Pk stall to Pk stall) at a 60-20-20 split. This split has given satisfactory results in similar studies by KDOT. The end results at this point are the numbers of Ps and of A's for each zone and for each trip purpose.

This result can be verified by comparison with the results obtained by using Equation 1, which was developed during a similar study in St. Cloud, Minnesota (1).

Total internal trips = 10062 + 2.4 x population of city

The resulting zonal Ps and A's are then used in the standard trip-distribution phase of the study.

REFERENCE