

Use of Electricity Consumption as an input for Cost Effective Traffic Forecasting

Tissa U. Liyanage and Amal S. Kumarage

Abstract: Numerous research studies have been done on urban travel demand during the last three decades but not much attention has been shown on the cost effectiveness of such methods given the high costs of collecting input travel data in urban areas. National level surveys are not adequately sensitive to small and medium urban centres as they do not represent local travel behaviour very well. This research examines the hypothesis that household travel demand in an urban centre is correlated to the electricity consumption of that household. This is considered a cost effective approach to ascertaining travel demand, given that electricity consumption can be more easily measured either on the disaggregate household level or aggregated area level.

This research based on analysis of empirical data collected in a suburban area in Colombo, has shown a very good relationship between the electricity consumption of households and its trip generation rates. This fit has been established through mathematical regression and is based on a hybrid process of category analysis. The analysis shows that household electricity consumption is positively correlated to trip generation rates. Moreover it shows that travel choice behaviour can also be modelled on electricity consumption. Hence this method of using electricity consumption data can be used as a cost effective and alternative approach to urban traffic forecasting.

Keywords: Travel Demand, Electricity Consumption Units, Suburban Area, Cost Effectiveness