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Estimating the Catchment Area of a Supermarket in Sri Lanka

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Unplanned developments are a serious issue contributing to traffic congestion in most countries. Therefore, a "Traffic Impact Assessment (TIA)" for with a proposed development should be undertaken before granting approval to proceed. Locally, the Urban Development Authority (UDA) in Sri Lanka considers a 500m radius from the site boundaries as the traffic impact study area in which TIAs are conducted. Many scholars argue that the geographical extent of a traffic impact area is not fixed: it may differ and should therefore be flexible. The vehicles attracted by new retail developments negatively impact on transport, contributing to traffic congestion relative to other developments. Retail stores along the road network generate additional traffic and change the spatial travel pattern of the street network. Therefore, it is better to understand spatial configurations and classify the retail spatial patterns of retail stores. This paper derives the spatial patterns of retail activity in Colombo, Sri Lanka by calculating the level of street integration and street connectivity using the space syntax technique in depth map software. This paper categorizes spatial patterns of retail activity to delineate the true catchment area of a supermarket through the GIS overlay tool and Network-Based Kernel Density Estimation (NKDE). The findings of this research illustrate that the true catchment area is not fixed and will differ based on the diverse operational requirements of each new retail development. This helps to create a better understanding of spatial patterns of the urban retail stores in Colombo area. It supports strategies for sustainable planning and development.

Keywords: *Catchment Area, Delineate, Retail Agglomerations, Supermarket, Traffic Impact Area*