Transit route catchment area analysis using GIS

Abstract: Spatial layout of routes is one of the main sources of complexity that preclude finding an optimal solution for the transit network design. Finding acceptable and good spatial layout of routes should satisfy important criteria such as route coverage, route application, route length and directness of route. All these factors contribute to the difficulty of solving the transit network design problem. It is of the common knowledge that part of route location analysis problem requires accurate estimation of population who would be using this system. Using GIS tools, various approaches are applied on some of the fixed routes in Adelaide, Australia for population estimation within the service/catchment area of a transit route and the results are discussed in this paper. The outcome of the research shows that when the route lengths are small, the population estimation in the service areas do not differ significantly which ever the method we use. However as the route length increases the area ratio method overestimates the population while the network ratio method underestimates the population. In the case of suburban routes land use ratio method produced better estimates when compared to area ratio method. Similarly this research showed that route buffers tend to overestimate the population compared to the bus stop buffers for routes of longer lengths.

Key Words: Transit service planning, GIS, Population coverage