Cost of Urban Bus Transit Operations and Geography of Service Territory

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Abstract

Bus transit cost studies have been limited in their spatial scope. Service territory variables characterizing differences among the physical settings where busses are operating have been largely neglected. The purpose of this paper is to expand empirical research on bus transit operation costs and test the hypothesis that physical and geographical characteristics are plausible explanatory cost factors. A translog cost function has been estimated, using a panel dataset of 1,061 observations over 1996-2002 for a cross-section of 264 transit agencies operating only diesel-powered busses in the U.S., combined with geographical and physical data processed with GIS technology. The results show that the total cost decreases with the population density, the average street segment length, and the percentage of flat land in the service territory. The elasticity of cost with respect to output, $\varepsilon_Q$, varies between 0.459 and 1.205, with a mean of 0.806. $\varepsilon_Q$ is <1 for 928 observations, indicating that economies of scale are experienced in 87.5% of the observations.