

# **Examining Transit Services in the Detroit Area: A Spatial Perspective**

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## **Abstract**

Like many other major metropolitan areas nation-wide, Detroit has experienced significant suburbanization. Facing a sprawling environment, two major local public transit providers, Detroit Department of Transportation (DDOT) and Suburban Mobility Authority for Regional Transportation (SMART), reviewed and modified their operations in order to cut back unnecessary expenditures while maintaining desired levels of service. For instance, both transit agencies started operating small shuttle buses with more flexible routes and schedules, or providing demand-respond paratransit services.

Geographic Information Systems (GIS) technologies, in conjunction with a transit on-board survey conducted in October 1995, are used to examine transit service performance from a spatial perspective. The fixed-route public transit services within the tri-county metropolitan area evaluated based on several accessibility measurements, such as population, employment, no vehicle household, etc. The 1990 Census Transportation Planning Package (CTPP) data is used to illustrate the spatial distribution of potential transit demand. Several applications were developed to aid transit agencies to evaluate different components of their operations. Such applications include buffering and integration of highway and transit data.

The DDOT 1995 on-board survey data is geocoded by Traffic Analysis Zone (TAZ) and analyzed spatially. For example, the highest ridership origin-destination pairs are identified and displayed using GIS so that transit providers can adjust their services, if necessary. Finally, GIS is used to further explore the spatial characteristics of the on-board survey data by developing several ridership forecast models. The legitimacy of using some traditional indicators, like population and employment, for predicting potential transit demand is discussed. It is hoped that the study results can be a valuable reference for transit providers to better predict transit demand by using existing information, such as CTPP.