

Abstract

Transit-Oriented Development (TOD) is an urban planning approach that integrates the transportation hubs and large-scale mixed land use development. Research has shown that TOD is an effective strategy in order to reduce the automobile dependency and it provides a more sustainable financing approach to costly infrastructure projects. Data have shown a modal shift from private to public transportation in in TOD regions.

This thesis aimed to assess the TOD efficiency based on the ridership model. The ridership of each station is considered as an output characteristic of TOD efficiency and 10 explanatory variables are selected as independent variables in three categories: demographics, land use, and transit accessibility. The Washington Metro Area is presented as a case study in this thesis. Stations along the Orange Metro line are selected for data collection and statistical analysis. Comparison is set between TOD and non-TOD stations. Comparing the average value of the indicator value to the average value of the non-TOD station, the results suggest that TOD station catchment areas generate more weekday ridership and exhibit land use characteristics following the design principles. However, the result obtained from the statistic regression models suggest that there is no strong relationship between the selected descriptors of TOD planning and programs. Then, data envelopment analysis method is applied to further test on TOD efficiency with the ridership of public transportation as the direct output characteristic. There are 6 most efficient stations and only 2 of them are planned as TOD. This result shows that TOD station does not have a higher efficiency in general. The further research should explore on evaluate of the influential descriptors to TOD project that can precisely represent the TOD project's performance. One suggestion is to include economic and management of the railway system.