Pengukuran Dampak Optimasi Rute Dan Layanan Terhadap Ridership Mikrotrans = Measurement of the Impact of Route and Service Optimization on Ridership of Mikrotrans

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Abstrak

Penyediaan jasa angkutan pengumpan di first mile merupakan faktor utama keberhasilan sistem angkutan umum, khususnya di kota metropolitan. Pelaku perjalanan di Jakarta cenderung menggunakan sepeda motor pribadi atau ojek online untuk mengakses transportasi massal seperti Mass Rapid Transit, KCI Commuter Line, dan Bus Rapid Transit. Studi ini mengasumsikan bahwa harga dan aksesibilitas adalah masalah kritis yang mempengaruhi popularitas mikrotrans sebagai layanan first mile. Penelitian menggunakan pendekatan dischrete choice model dengan survei stated preference dalam menangkap preferensi msyarakat terhadap mikrotrans Jaklingko setelah dilakukan optimasi layanan dan rute. Riset ini juga mengembangkan algoritma optimasi rute angkutan umum yang bisa diterapkan pada berbagai angkutan sejenis di wilayah lain. Studi ini menghitung nilai aksesibilitas di wilayah studi berdasarkan metode berbasis infrastruktur dan graviti. Hasil penelitian menunjukkan bahwa optimasi rute angkutan umum bisa dilakukan secara iteratif dengan menggunakan geoprocessing tools pada aplikasi Quantum Geographic Information System (QGIS). Proses optimasi menggunakan dua objective function yaitu memaksimalkan luas Pedestrian Catchment Area yang kurang atau sama dengan 500 m (PCA500m) serta memaksimalkan jumlah fasilitas umum yang dilayani. Optimasi rute mikrotrans mengakibatkan preferensi masyarakat meningkat yang dibuktikan dengan kenaikan nilai WTP dan potensi peralihan moda dari kendaraan pribadi ke mikrotrans sebesar 11.5% dan 10.6% berturut-turut. Pengukuran nilai aksesibilitas dengan model data raster memberikan hasil yang lebih detail dan akurat.

.....The provision of feeder transport services on the first mile is a major factor in the success of the public transport system, especially in metropolitan cities. Travelers in Jakarta tend to use private motorcycles or online motorcycle taxis to access mass transportation such as Mass Rapid Transit, KCI Commuter Line, and Bus Rapid Transit. This study assumes that price and accessibility are the critical issues affecting the popularity of microtrans as a first mile service. The study uses a discrete choice model approach with stated preference surveys in capturing people's preferences for Jaklingko microtrans after service and route optimization have been carried out. This research also develops an optimization algorithm for public transport routes that can be applied to various types of transportation in other areas. This study calculates the value of accessibility in the study area based on the infrastructure and gravity based methods. The results show that the optimization of public transport routes can be done iteratively using geoprocessing tools in the Quantum Geographic Information System (QGIS) application. The optimization process uses two objective functions, maximizing the Pedestrian Catchment Area with less than or equal to 500 m walking distance (PCA500m) and maximizing the number of public facilities served. Optimization of the microtrans route results in public preferences improvement as evidenced by the increase of WTP value and potential shifting from private vehicles to microtrans by 11.5% and 10.6%, respectively. Measurement of accessibility values with raster data models provides more detailed and accurate results.