

INTISARI

Kota Surabaya mengalami pertumbuhan wilayah secara signifikan selama beberapa tahun terakhir sehingga meningkatkan kebutuhan akan layanan transportasi umum. Pemerintah Kota Surabaya telah menyediakan layanan berupa Suroboyo Bus, Trans Semanggi, dan Wirawiri, dengan 10 koridor utama dan 11 koridor pengumpan yang tersebar di seluruh Kota Surabaya. Meskipun demikian, aksesibilitas masyarakat terhadap layanan tersebut masih memiliki keterbatasan karena cakupan spasial layanan dalam radius 300 meter dari titik pemberhentian bus (TPB) belum mampu melayani seluruh kawasan. Kesenjangan spasial dari jangkauan layanan memerlukan kajian untuk mengidentifikasi area prioritas penambahan TPB baru. Penelitian diarahkan untuk melakukan penambahan TPB pada layanan Wirawiri yang mampu menjangkau kawasan permukiman padat untuk memperluas cakupan layanan dan meningkatkan aksesibilitas transportasi umum.

Penentuan lokasi TPB rekomendasi Wirawiri dilakukan melalui pendekatan analisis jaringan berbasis algoritma Dijkstra dan analisis *Multi Criteria Decision Making* (MCDM). Data TPB dan rute layanan didapatkan melalui proses digitasi dari aplikasi GOBIS Suroboyo. Proses pencarian daerah layanan dilakukan dengan *service area analysis* sejauh 100, 200, dan 300 meter. TPB rekomendasi Wirawiri diletakkan di luar area layanan eksisting sepanjang rute aktif koridor layanan. Nilai efektivitas setiap TPB rekomendasi dihitung dengan mengintegrasikan berbagai kriteria spasial melalui MCDM metode *Simple Additive Weighting* (SAW). Evaluasi efektivitas TPB didasarkan dari kriteria kepadatan penduduk, geometri jalan, jumlah fasilitas umum, dan tata guna lahan. Data kriteria tersebut diperoleh dari berbagai sumber yakni peta Rupa Bumi Indonesia (RBI), *Google Open Buildings*, Badan Pusat Statistik (BPS), dan *Open Street Maps* (OSM).

Hasil dari kegiatan aplikatif berupa peta daerah layanan dari TPB aktif beserta fasilitas umum di sekitarnya, peta lokasi rekomendasi TPB Wirawiri baru, serta peta daerah layanan Wirawiri dengan TPB rekomendasi. Berdasarkan hasil identifikasi kesenjangan di sepanjang rute aktif Wirawiri diperlukan adanya penambahan sejumlah 40 TPB rekomendasi yang tersebar ke dalam 6 koridor layanan pengumpan eksisting. TPB tersebut menunjukkan bahwa sebagian besar berada di area permukiman. Implementasi penambahan TPB Wirawiri rekomendasi menghasilkan peningkatan aksesibilitas yang ditunjukkan dengan peningkatan luas cakupan layanan sebanyak 0,70% dari luas Kota Surabaya dan kenaikan jumlah populasi terlayani sebesar 1,05% dari jumlah seluruh penduduk pada tahun 2024.

Kata Kunci : Titik Pemberhentian Bus (TPB), aksesibilitas, analisis jaringan, area layanan, MCDM

ABSTRACT

The city of Surabaya has experienced significant territorial growth over the past few years, thereby increasing the demand for public transportation services. The Surabaya City Government has provided services such as Suroboyo Bus, Trans Semanggi, and Wirawiri, with 10 main corridors and 11 feeder corridors spread throughout the city of Surabaya. However, public access to these services remains limited because the spatial coverage within a 300 meter radius of bus stops has not yet been able to serve all areas. This spatial gap in service coverage requires a study to identify priority areas for adding new bus stops. This study is aimed at incorporating TPB into the Wirawiri service, which is capable of reaching densely populated residential areas, in order to expand service coverage and improve accessibility to public transportation..

The location of the Wirawiri-recommended TPBs was determined using a network analysis approach based on Dijkstra's algorithm and Multi-Criteria Decision Making (MCDM) analysis. TPB and service route data were obtained through a digitization process using the GOBIS Suroboyo application. The service area search was conducted using service area analysis at radii of 100, 200, and 300 meters. The Wirawiri-recommended TPBs are located outside the existing service areas along the service active corridor routes. The effectiveness score for each recommended TPB was calculated by integrating various spatial criteria using the Simple Additive Weighting (SAW) method within the MCDM framework. The evaluation of TPB effectiveness was based on criteria such as population density, road geometry, the number of public facilities, and land use. Data for these criteria were obtained from various sources, including the Rupa Bumi Indonesia (RBI) map, Google Open Buildings, the Central Statistics Agency (BPS), and OpenStreetMap (OSM).

The results of the applied study include a service area map of active bus stops and surrounding public facilities, a map of recommended Wirawiri bus stop locations, and a Wirawiri service area map featuring the recommended bus stops. Based on the results of the gap analysis along the active Wirawiri route, it is recommended that 40 additional bus stops be added, distributed across the 6 existing feeder service corridors, it was found that the majority of these bus stops are located in residential areas. The implementation of the recommended Wirawiri bus stops resulted in improved accessibility, as evidenced by a 0,70% increase in service coverage area relative to the total area of Surabaya and a 1,05% increase in the served population relative to the total population in 2024.

Keywords : bus stops, accesibility, network analysis, service area, MCDM