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The Design of Trans Jateng Bus Stop for Susuwono Region to Establish Clean Transportation

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Abstract

This study aimed to analyze the suitability of the planned Trans Jateng bus stop points with user service distances. Quantitative descriptive research method was employed in this study. The population in this study were the corridors of the Trans Jateng bus plan, land use, the national urban system, and the surrounding community. The independent variable in this study was the distribution of planned Trans Jateng bus stop points in the Susuwono area, whereas the dependent variable was the appropriateness of the planned Trans Jateng bus stop points with user service distances and surrounding land use. Spatial analysis, environmental analysis, suitability analysis of bus stop locations, and buffering were utilized as data research methods. The results of the study showed that 1) the buffering of the planned bus stop points in the Surakarta area was categorized as maximal, 2) the service distance of the Trans Jateng bus plans in the Sukoharjo District area was categorized as moderately optimal to less than optimal, 3) the service coverage of the Trans Jateng bus stop points was categorized as moderately maximal up to less than optimal based on the buffer map of the planned Trans Jateng bus corridor in the Wonogiri District area. This study concluded that the Trans Jateng bus stop plan is dominated by moderately maximum service coverage.

Keywords

Bus Rapid Transit, Bus Stop, Trans Jateng, Susuwono

1. Introduction

People need an affordable and comfortable mode of mass transportation. The Department of Transportation of Central Java Province provides public transport,

such as the Trans Jateng bus. The government expects that this trans bus can reduce the use of private vehicles (Irfana et al., 2019). Global temperatures as the presence of carbon dioxide in the atmosphere continuously increasing (Setyowati et al., 2020). Reducing the number of motorized vehicles on the highway can reduce air pollution due to increased carbon dioxide, methane, and other gases (Mehlig et al., 2023). In 2021, private vehicle ownership, both cars and motorbikes, reached 19,628,772 vehicles, with a population in Central Java of 36,742,501 people (BPS, 2022). This data means that more than half of the population owns private vehicles. The Trans Jateng bus is a Bus Rapid Transit (BRT) type that allows users to no longer wait for long for the bus due to limited passengers.

Bus Rapid Transit is an efficient and cost-effective urban mobility transportation system that offers residents safe and high-quality transportation services (Nadeem et al., 2021). According to Ma'ruf (2021), Bus Rapid Transit provides faster and more efficient services than other modes of transportation at a low cost for all groups. Bus Rapid Transit lines can reduce commuter travel time to reach work compared to using traditional transportation in cities (Oviedo et al., 2019). Trans Jateng can contribute significantly to national development because land transportation is considered more efficient than other types of transportation in Central Java Province. If examined, developing modes of transportation means improving and refining the transportation system and transporting people and goods using specific means of transportation (Wardana, 2012). Trans Jateng is a concrete form of developing mass transportation modes in Central Java.

Trans Jateng buses will operate in all areas of Central Java Province starting from the scope of the main development division area of Central Java Province. There are eight divisions of development areas, with the main regional groups including Bergasmalang, Petanglong, Kedungsepur, Wanarakuti, Banglor, Subosukawonosraten, Purwomanggung, and Barlingmascakeb. This regional grouping aims to seek equitable development by maintaining the existing diversity. Currently, there are 6 Trans Jateng bus corridors operating in Central Java Province, including corridor 1 Bawen Terminal (Semarang Regency)-Tawang Station (Semarang City); corridor 2 Bulupitu Terminal (Purbalingga)-Bukateja Terminal (Purwokerto); corridor 3: Bahurekso Terminal (Kendal Regency)-Mangkang Terminal (Semarang); corridor 4 Terminal Sumberlawang (Sragen)-Terminal Tirtonadi (Solo); corridor 5 Terminal Borobudur (Magelang)-Kutoarjo Station (Purworejo); and corridor 6 Penggaron Terminal (Semarang)-Godong Terminal (Grobogan). A road is classified as a corridor if it can connect one place to another and combine parts of that place (Darmawan et al., 2005).

The level of population density causes the potential for a high demand for public transport due to urbanization flows in urban areas such as the city of Surabaya (Hayati et al., 2017). The increase in urban population generates higher activity and the number of trips for both people and goods (Dwiryanti & Ratnasari, 2013).

The increase in population in one of the leading development areas in Central Java Province, Subosukawonosraten, is directly proportional to the increase in the number of vehicles, the mobility level, and the demand for public transport. This rise was unequal to the efforts to widen the road resulting in congestion. Congestion induces several adverse effects, such as disrupted flow of goods, the inefficiency of workers' time, increased accidents, wastage of fuel, and air pollution (Putra & Kurnia, 2014). This problem has made the Subosukawonosraten area the next target in developing the Trans Jateng bus by the Department of Transportation of Central Java Province. Based on the government's data, Subosukawonosraten has one corridor built to overcome congestion as a means and infrastructure for mass transportation (Saputra et al., 2017). However, this corridor has only passed through Sragen to Surakarta. Therefore, the Department of Transportation Central Java Province has begun to develop Trans Jateng buses in other areas in Subosukawonosraten and develop plans for Trans Jateng bus stop points in several areas, such as Surakarta City, Sukoharjo District, and Wonogiri/Susuwono District.

The Trans Jateng bus development plan is in collaboration with the German government through the Green Infrastructure Initiative project with the concept of sustainable development. The bus stop point in the Susuwono area is still a program that requires spatial analysis. As a consideration, Trans Jateng bus users must get on and off at specific stops. Accordingly, the designed stop point is very influential on the comfort of reach of users. Furthermore, the spatial analysis in this study helps consider the suitability of the service range of bus stops with users and considers bus stop points to be integrated with other modes of transportation. One of the essential keys to successfully implementing this bus-based mass public transport policy is that BRT routes must be integrated with other modes of transportation (Mahardhini & Rahdriawan, 2012).

The Trans Jateng bus can be an option for the community to mobilize to reduce congestion and dependency on private vehicles, especially for commuters. The high number of motorized vehicles results in higher fuel consumption, with high carbon dioxide emissions (Abdul et al., 2018). Trans Jateng bus will reduce air pollution from motorized vehicle carbon emissions. The study aims to 1) analyze the Trans Jateng bus corridor plan in Susuwono regarding public transport demand potential and 2) analyze the appropriateness of the designed Trans Jateng bus stop points with user service distances.

2. Literature Review

2.1. Bus Rapid Transit (BRT)

Good transportation facilitates access and participation in meaningful life activities (Lucas, 2012). The government is responsible for providing safe, secure, comfortable, and affordable public transportation. Through the Bus Rapid Transit (BRT), the government seeks a sound transportation system to serve the community. Bus Rapid Transit is a way to increase mobility at a relatively low cost through

additional investment and a combination of operational and technological movement infrastructure (Purwantoro, 2020). The bus rapid transit system is a modern solution to mass transportation systems (Gunawan et al., 2014). The centralization of employment opportunities, services, and recreation will force the population of suburban areas to travel long distances. At the same time, modes of transportation still need to be expanded and more affordable. Mass transportation systems such as BRT are essential in cities to connect suburban areas with other areas.

BRT operation requires supporting facilities such as bus stops (Wibowo et al., 2018). Bus stops are places for public transport passengers to carry out their activities of getting on and off transportation, built into the transportation service network section (Arnaya & Ramadhan, 2020). The accessibility of BRT bus stops is vital because it is one of the aspects people consider when choosing a mode of transportation (Nusantara & Setyono, 2019). It is crucial to pay attention to the environment around the community in building shelters, for example, schools, shopping centers, housing, offices, hospitals, and other public areas easily accessible to the community (Agita et al., 2021). Some of the main principles of providing a bus stop design, according to Hayati et al. (2017), namely:

a) Bus stops allow buses to stop parallel and as close to the sidewalk as possible for effective use of the bus facility.

b) The ideal bus stop location should be safe and convenient.

c) Some signals, especially public facilities, should be clearly visible and accessible to users.

d) Bus stops should allow passengers to take shelter.

e) The location of the bus stop allows passengers to freely see the position of the approaching bus and the information board.

The optimization of BRT networks involves careful planning and the incorporation of advanced technologies. According to Cervero and Kang (2011), planning for BRT systems must focus on reducing travel time, ensuring frequent and reliable services, and minimizing the impact of congestion. Moreover, BRT networks should be integrated with other public transport modes to create a seamless multimodal system (Vuchic, 2007). Furthermore, the design of the BRT infrastructure, such as dedicated lanes and efficient scheduling, plays a pivotal role in improving system efficiency.

BRT systems are also influenced by accessibility, which involves ensuring that stations and bus stops are well-integrated into the urban fabric. Accessibility to BRT stations has a significant impact on user satisfaction and ridership (Nusantara & Setyono, 2019). The design of bus stops should prioritize passenger convenience and safety, as outlined by Hayati et al. (2017), and also consider accessibility for people with disabilities (Lucas, 2012). Furthermore, research by Jaber et al. (2024) emphasizes the importance of optimizing station locations and ensuring that they are within walking distance from residential areas, shopping centers, and other key destinations.

2.2. Trans Central Java (Trans Jateng)

The Trans Jateng bus is public transportation with a Rapid Transit system that functions as urban agglomeration transportation in Central Java (Purnomo & Herijanto, 2021). This public transportation has services according to the applicable Minimum Service Standards (SPM) and Standard Operating Procedures (SOP) (Amelia et al., 2020). This statement is evident in research on the Trans Jateng Purwokerto-Purbalingga Corridor, which generally has met the SPM. However, one aspect still needs to be fulfilled regarding the distance between bus stops, which is still too far (Sari & Afriandini, 2020). In addition, other studies showed that users of the Trans Jateng Purwokerto-Purbalingga Corridor service were quite satisfied (Sangadah et al., 2021). One aspect that must be important for Trans Jateng is the location of the bus stop, which is still relatively far. Nonetheless, the number of passengers continues to increase every year. **Table 1** shows the increase in the number of passengers on the Trans Jateng Corridor 1 Semarang (Tawang)-Bawen from 2017 to 2019.

To improve the Trans Jateng system, the distance between bus stops should be re-evaluated, as long distances between stops can lead to inefficiencies and reduced ridership. Research by Li et al. (2024) suggests that the optimization of bus stop locations can significantly enhance service accessibility and reduce travel time for passengers. Additionally, integrating Trans Jateng with other public transportation systems and improving the intermodal connectivity of the routes will enhance overall network efficiency. By improving both infrastructure and service planning, Trans Jateng can continue to grow and meet the transportation needs of the region.

Table 1. Number of Trans Jateng Passengers Corridor 1 Semarang (Tawang)-Bawen.

Month	Year		
	2017	2018	2019
January	-	136.444	178.628
February	-	127.775	166.882
March	-	141.309	188.728
April	-	138.558	176.426
May	-	156.321	172.712
June	-	136.031	160.227
July	74.790	165.165	181.907
August	117.16	169.779	177.772
September	121.77	169.779	177.772
October	137.55	175.500	181.059
November	133.05	178.228	177.621
December	139.98	178.774	180.709
Total	724.32	1.869.48	2.117.39

3. Research Methodology

This study employed a quantitative descriptive research method. The research locations were Surakarta City, Sukoharjo District, and Wonogiri District (Figure 1). The population of this study includes the corridors of the Trans Jateng bus plan, land use, and residents around the planned bus stops. The determination of the planned stop point at Susuwono on the corridor of the Trans Jateng Bus plan conforms to the data from the Department of Transportation of Central Java Province. It was determined using a total sampling technique (saturated sample). Samples of land use are places of recreation or tourism, transportation (roads, railroads, airports, and the Trans Jateng bus plan corridor in Susuwono), public buildings (government, educational, and religious buildings), and industrial and commercial (industry, commerce, and services) affected by a buffering area of 500 meters. Meanwhile, the sampling of land use areas in Susuwono uses the area sampling technique. Important information from Central Java Transportation Service staff at the Department of Transportation of Central Java Province and the Infrastructure and Transportation Division at BAPPEDA Central Java Province was selected using a purposive sampling technique. Using incidental sampling techniques, the research population was also obtained from residents around the planned bus stops.

The variables used in this study included the distribution of planned Trans Jateng bus stop points in the Susuwono area and the suitability of the designed Trans Jateng bus stop points with user service distances and surrounding land use (Table 2).

Table 2. Variables, sub variables, and research indicators.

Variable	Sub Variable	Research Indicators
Distribution of the Designed Trans Jateng Bus Stop Points in the Susuwono Area	Planned stop point	a) Bus stop name b) Coordinate point
	Service distance	a) Congested (300 - 500 m) b) Less congested (500 - 1000 m)
	Land Use	

The data collection techniques in this study were divided into primary and secondary data collection. Primary data collection was conducted through several main steps. First, the interpretation of land use maps, national urban systems, service distances, and population maps was carried out to obtain an initial understanding of the geospatial conditions of the research area. This step helped identify physical and social characteristics relevant to the development of the Bus Rapid Transit (BRT) system.

Next, field observations were conducted directly at the research locations to validate the data obtained from map interpretation. These observations included examining actual land use and measuring service distances directly in the field.

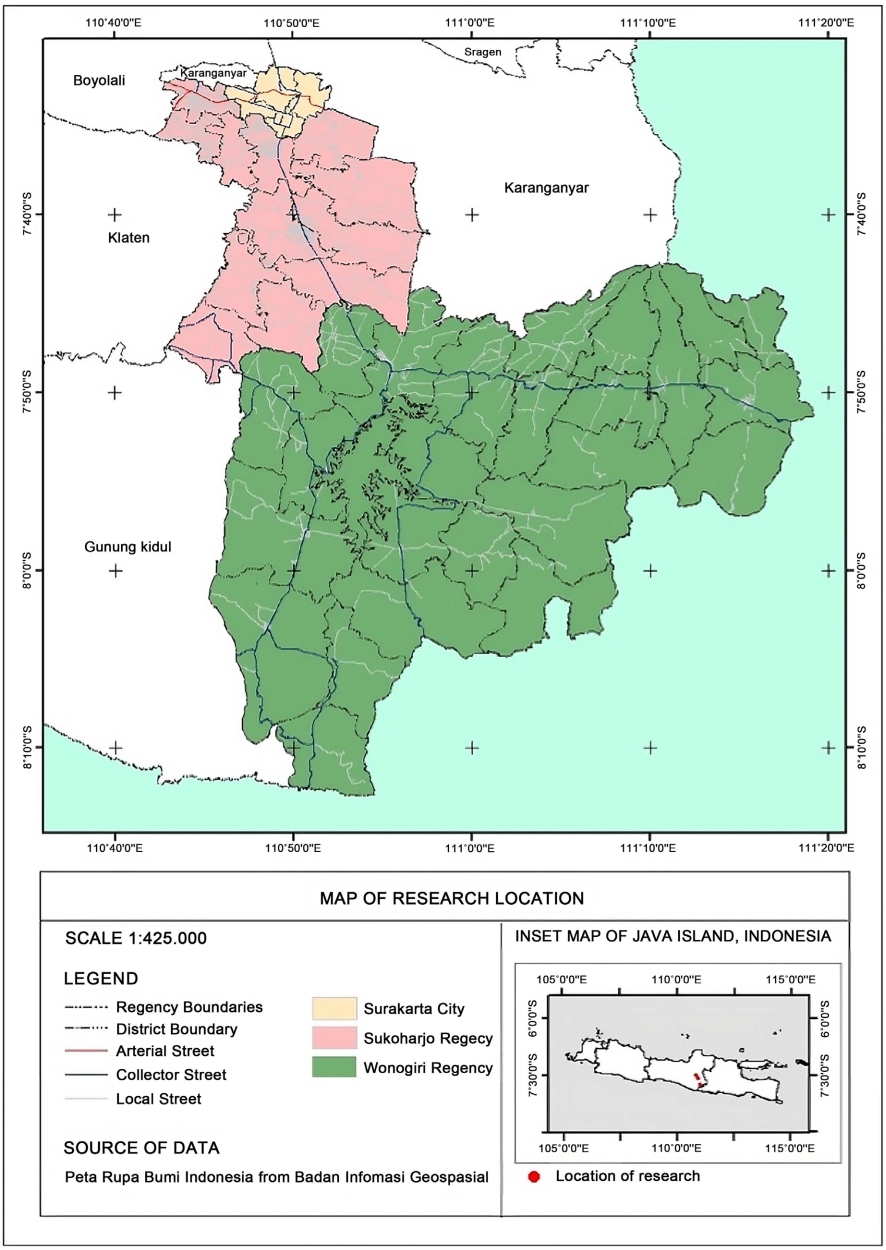

Figure 1. Map of research area.

Observations were also used to record elements that might not be visible in the map data, such as the physical condition of the environment around the bus stop locations.

The final step in primary data collection was unstructured interviews with staff from the Central Java Department of Transportation and the Central Java Provincial BAPPEDA. These interviews aimed to gather qualitative information about policies, challenges, and strategies in BRT system planning. The information obtained from these interviews provided important additional context for understanding transportation policies and local community needs. However, one of the weaknesses of this study was the lack of integration of interview findings into the

results and discussion sections, which potentially reduced the credibility and depth of the study's analysis.

Secondary data collection in this study involved data from valid sources, such as Google Earth satellite imagery for Surakarta City, Sukoharjo District, and Wonogiri District. Additionally, documents related to the planning of BRT Trans Jateng bus stop locations from the Central Java Department of Transportation were utilized. Supplementary data, such as population documents from the Central Java Statistics Agency (BPS), served as key references for analysis.

This study had several limitations that should be noted. Its focus on the Susuwono area restricted the generalizability of its findings to other areas with different geospatial and socio-economic characteristics. Furthermore, the study did not consider other important factors that could influence the effectiveness of the BRT system, such as fare pricing, service frequency, and vehicle capacity. This omission rendered the analysis of service effectiveness less comprehensive.

The analysis methods employed relied heavily on descriptive statistics and buffering analysis, without incorporating statistical significance testing or more advanced statistical methods. This limitation hindered the study's ability to draw robust conclusions about the relationship between service distances and user satisfaction. Addressing these weaknesses, such as by applying advanced statistical methods and integrating qualitative findings into the study results, could enhance the validity and depth of the analysis, thereby providing more profound insights into the effectiveness of the BRT system. As shown in Table 3, secondary Data to strengthen research data in the field regarding the BRT system.

Table 3. Secondary data.

No	Data Types	Data source
1	Google Earth satellite image of Surakarta City, Sukoharjo District, and Wonogiri District	Google Earth
2	Study Document of Trans Jateng Bus Stop Point Plan in Susuwono	Department of Transportation of Central Java Province
3	Resident documents for Surakarta City, Sukoharjo District and Wonogiri District	BPS Central Java

The analysis techniques in this study included spatial analysis, environmental analysis, and analysis of the suitability of bus stop locations, described as follows.

a) Spatial analysis was employed to assess the distribution of space used in the development plan for the Trans Jateng Bus Corridor in the Susuwono area. Therefore, supporting data is needed, such as coordinates, land use, and urban systems around bus stops, as well as the service distance, to assess the situation on the field.

b) The environmental analysis was utilized to analyze space by linking the location of the bus stops and the surrounding community as potential users of the Trans Jateng bus in Susuwono.

c) Analysis of the suitability of the location of the bus stops.

$$SHL = PLPP + E$$

Source: Modification by researchers from Wardana, 2012.

Explanation:

SHL (*Suitability Halte Location*) = Suitability of bus stops with service distance, national urban system, and surrounding land use.

PLPP = Land use and national urban systems as trip generators.

E (*Effectivity*) = Level of effectiveness in terms of built land use.

After the calculation process, there was a scoring process based on each category's minimum trend or average value, followed by an accumulation process. The next stage was executed using the deductive logic analysis method, drawing specific conclusions from interpretation results and general data.

d) Buffering analysis—conducted on land use maps and national urban systems where there are planned Trans Jateng bus stop points to obtain information on the service distance of one bus stop point to users. After that, the results were compared with the surrounding national land use and urban systems. The buffering technique determines the optimal operational coverage area for the Trans Jateng bus stop with a buffering area of 500 meters.

4. Results and Discussion

4.1. Suitability of the Planned Trans Jateng Bus Stop Point with User Service Distance

The service coverage of the Trans Jateng bus stops is designed to align the bus services with the surrounding land use, ensuring efficient access for residents and users. The service distance for each bus stop is categorized into three levels: maximum (300 - 500 meters), moderately maximum (500 - 1000 meters), and less than maximum (>1000 meters). This classification helps assess the accessibility of each bus stop and its proximity to key locations. The majority of the planned bus stops for the Trans Jateng system fall into the moderately maximum category, indicating that the service coverage is within the range of 500 to 1000 meters. While this coverage provides a decent level of access for many users, there are areas where the bus stops may not meet the optimal service distance, particularly in more sparsely populated regions or areas with land uses that do not support frequent stops. This distribution of service coverage suggests the need for strategic planning to ensure that all areas, especially those further from the stops, are adequately served to enhance the overall effectiveness and accessibility of the system.

1) Surakarta City Service Distance

Based on the buffering results for the planned bus stops in the Surakarta area, as depicted in **Figure 2**, the buffer map for the Trans Jateng bus corridor plan reveals that the service coverage falls within the maximum category. This means that a significant portion of the area surrounding the planned bus stop locations is well-served by the Trans Jateng system, with service distances within the optimal range for users. The maximum service category typically covers distances

between 300 and 500 meters from the bus stop points, ensuring that most residents and activity centers in Surakarta are within a reasonable walking distance of the bus stops. This extensive coverage indicates that the planned route for the Trans Jateng bus system is strategically located to maximize accessibility for commuters, providing a vital transportation link for both residential areas and key commercial or educational hubs. Furthermore, the close proximity of the bus stops to these locations will likely encourage greater public transportation use, as it reduces the barriers to accessing the service, such as long walking distances. Therefore, the buffering analysis demonstrates that the Surakarta area is well-positioned to benefit from the proposed Trans Jateng bus system, with its service coverage meeting the needs of the local population effectively.

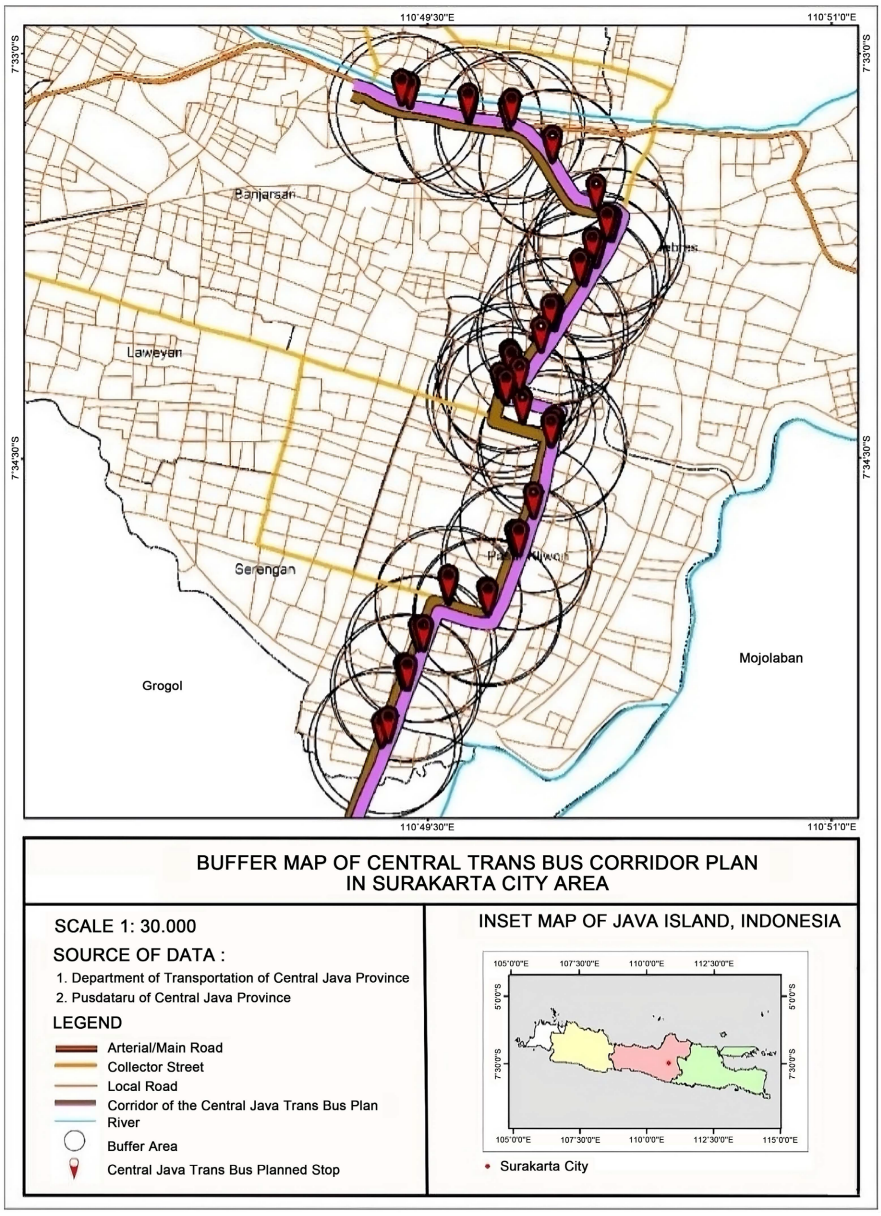

Figure 2. Buffer map of the trans Jateng bus corridor plan in Surakarta.

2) Sukoharjo District Service Distance

The planned service distance for the Trans Jateng bus in Sukoharjo District falls within the moderate to maximal category. As shown in Figure 3, the buffer map reveals that certain bus stop points are located at relatively greater distances from one another, which results in varying levels of service coverage across the district. While some areas are within the ideal service range of 300 - 500 meters, other areas are further away, with distances approaching 1000 meters or more. This indicates that parts of the district may not receive optimal service coverage, which could present challenges for residents who rely on public transportation. The gaps between bus stops in these areas may lead to longer walking distances, potentially reducing the attractiveness of the Trans Jateng bus system for local commuters. To address this, further adjustments to the bus stop locations or the addition of more stops could be considered to ensure more even service coverage and reduce the distance users must travel to access the system. Expanding the network of bus stops in these less-served areas could help improve overall accessibility and increase the effectiveness of the Trans Jateng bus service in Sukoharjo.

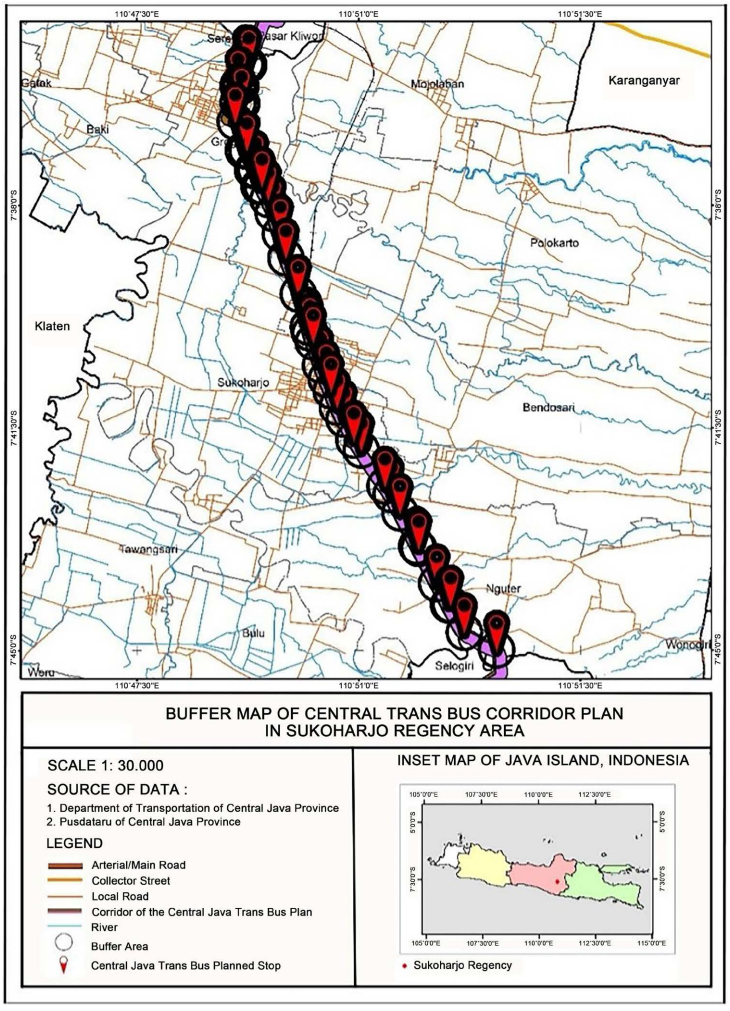

Figure 3. Buffer map of the trans Jateng bus corridor plan in Sukoharjo district.

3) Wonogiri DIstrict Service Distance

Figure 4 illustrated that the service coverage of the Trans Jateng bus stop points in Wonogiri District was similar to that in Sukoharjo District, falling within the range of moderately maximal to less than maximal. This service coverage pattern is primarily due to the land use characteristics in the area. In the region between Sukoharjo and Wonogiri, the surrounding land is predominantly composed of rice fields and industrial zones, which naturally results in greater distances between bus stops. The agricultural and industrial nature of the area leads to less frequent population centers, which in turn increases the spacing between bus stops. As a result, the coverage falls short of the ideal service range, requiring longer distances between bus stops in certain parts of Wonogiri. The vast expanses of rice fields and industrial land, coupled with fewer densely populated areas, make it challenging to provide service within the optimal distance of 500 meters for every user. To improve service in such areas, it may be necessary to consider alternative solutions, such as adding more bus stops or adjusting routes to ensure better connectivity and reduce travel time for passengers.

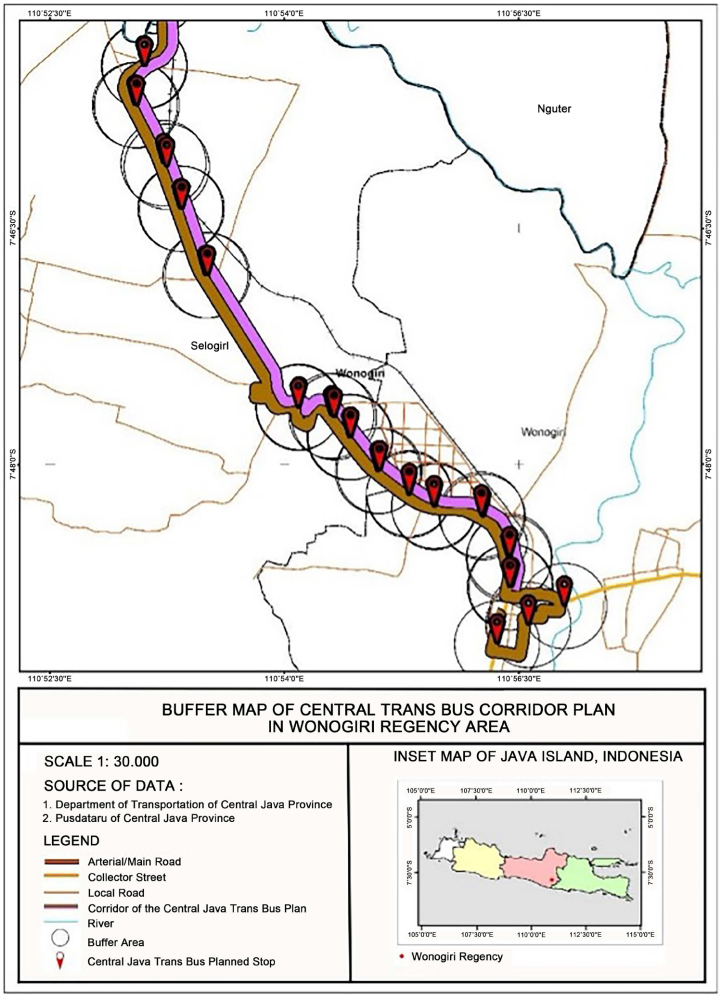

Figure 4. Buffer map of the trans Jateng bus corridor plan in Wonogiri district.

4.2. Discussion

BRT plays a significant role in equitable development. One of the facilities that need to be considered is the route that the BRT will pass. Rapid transit access services are the key to achieving efficient costs (Ramos-Santiago, 2022). A BRT system costs 4 - 20 times lower than Light Rail Transit (LRT) and 10 - 100 times lower than a subway system. This study discussed route plans in the Surakarta, Sukoharjo, and Wonogiri areas.

The route plan that will be passed by in Surakarta is close to residences and activity centers. This strategic location makes the scope of its services maximal. The close distance to residences and activity centers requires the availability of infrastructure facilities for bus stops. One of the supporting facilities is the sidewalk. A sidewalk to the BRT bus stop can make it easier for pedestrians to get there (Purwanto & Manullang, 2018). In an integrated transportation system, sidewalks as pedestrian feeder facilities were inseparable from BRT stops (Hu et al., 2013). According to Ramos-Santiago (2022), a transit journey can only occur with a functional, safe, and convenient link from the origin of the journey to the transit service. Therefore, maximum service coverage must be balanced with adequate facilities and infrastructure to attract people's interest in using this mass transportation mode. Another essential facility and infrastructure are the separation of special lanes for BRT. BRT services do not increase travel speed in densely populated city areas during peak hours but provide a slight advantage of lane segregation (Jain et al., 2022).

The service distance in Sukoharjo District is in the category of moderately maximal to less than maximal. Reviewing the route planning to minimize the less-than-maximal service coverage is vital. Locations with points far apart need additional bus stops to maximize service distances, especially in areas where community centers and residences are located. The purpose is to reduce the relative travel time, which can be reduced by increasing the frequency and speed (Chiu, 2022). Unlike the Wonogiri District case, land use is in the form of agricultural and industrial land. This land use causes the service distance to be relatively far, so the service coverage becomes moderately maximal to less than maximal. However, the service distance follows the Engineering Guidelines for Public Passenger Vehicle Stops (1996), which stated that the use of residential land, fields, rice fields, and rare vacant land, must have a distance between bus stops of 500 - 1000 meters.

The planning for the Trans Jateng bus route follows these technical guidelines. However, there are other options by adding bus stops and BRT units. The addition of these stops seeks to reduce walking time to BRT stops. In Barranquilla, Colombia, some people reported long walking and waiting times when accessing the BRT system, especially when using the feeder route (Santana Palacios et al., 2020). Accordingly, this problem can be anticipated by adding BRT stops and units. In addition to adding Rapid Transit bus units, the government can develop organized mass transportation to transport agricultural products. With this cooperative, society can boost the economy independently featuring the development of mass

transportation (Permana et al., 2017). Rapid developing countries like China utilize transportation for economic progress. Furthermore, this transportation trend is increasing yearly, except during a pandemic (Zhao et al., 2022).

The unstructured interviews with staff from the Transportation Department of Central Java were conducted as part of the qualitative data collection. The results of these interviews provided in-depth information regarding the transportation policies currently being implemented, challenges in the planning and implementation of the Bus Rapid Transit (BRT) system, and the government's perspective on the potential development of the transportation system in the future. Through these interviews, the staff explained the factors influencing decisions regarding bus stop locations and strategies for developing transportation infrastructure to ensure better accessibility. However, it is important to note that although these interviews provided valuable insights, the results were not directly integrated into the analysis of the results and discussion sections, which could reduce the depth and credibility of the overall findings. Integrating the interview findings into the results and discussion sections could provide a more comprehensive picture of transportation policies and the challenges faced in implementing the BRT system.

In addition to adding bus stops or changing the transportation model, one solution that can be considered is optimizing existing routes. This optimization can be achieved by conducting a thorough evaluation of user travel patterns and the most frequently used service points. One approach that can be applied is using mobility data analysis to determine more efficient routes and reduce users' travel distances. Adjusting routes to be more flexible while considering demand factors and area density can enhance accessibility and improve service coverage.

Furthermore, integrating the BRT system with other modes of transportation can also be an effective solution to improve efficiency and accessibility. The BRT system should not operate in isolation, but rather be integrated with other transportation networks, such as trains, local public transit, and even app-based transportation systems. According to research by Cervero and Kang (2011), integration between transportation modes can enhance the effectiveness of mass transit by facilitating smoother transitions between modes and expanding service reach. For example, users could access BRT stations directly connected to train stations or public transport terminals, reducing travel time and improving user convenience.

5. Conclusion

Trans Jateng is a concrete form of developing mass transportation modes in Central Java. To conclude, the plan for the Trans Central bus stop is dominated by moderately maximum coverage based on the results of the research and discussion. In order to maximize Trans Jateng bus distance services, related parties can increase the number of bus stops, primarily in areas of community activity centers and residences. Adding the number of bus stops will increase service coverage to the maximum. Another alternative is to change the transportation model for harvesting crops, specifically at bus stop locations close to agricultural land.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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