

Analysis on the Effectiveness of the Wira-Wiri Suroboyo Feeder in Increasing Urban Mobility Using Participant Observation Method

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ABSTRACT

The Feeder Wira-Wiri Suroboyo is a transportation service specifically designed to enhance connectivity and efficiency within Surabaya's public transportation network, particularly by serving areas that are not accessible by regular buses. Despite being a well-managed public transportation service overseen by the city government, this form of transportation has not successfully encouraged widespread participation from the Surabaya community in its utilization. The purpose of this study was to identify operational problems in the Feeder Wira-Wiri Suroboyo using the participant observation method. Observations were conducted on different days and times to evaluate performance and identify strengths and weaknesses in feeder operations. The participant observation method involved researchers who actively used the service to gain direct experience and accurate data. The findings showed that although the feeder operated effectively, especially during peak hours, and provided adequate basic facilities, there were several areas that needed improvement. The primary problems identified include extended waiting times, the absence of an audio information system or notification system, and inaccuracies in application-based tracking. In order to improve operational effectiveness, recommended improvements are in waiting times, development of an audio notification system, and accuracy of application tracking. This study provides a reference for the Surabaya City Government to further improve the Feeder Wira-Wiri Suroboyo service so that it can be an alternative means of transportation to reduce congestion in the city of Surabaya.

Keywords: *Participant Observation; Wira Wiri Feeder; Public Transportation;*

INTRODUCTION

Surabaya is one of the largest metropolises in Indonesia and plays an essential role as an economic and business center. Surabaya's metropolitan characteristics are characterized by its role as an economic and business center, advanced infrastructure, significant population density, and a well-developed healthcare system (Hayati et al., 2023). In order to establish an efficient, sustainable, and comfortable city to live in, the local government needs to provide public transportation facilities to support community mobility in the metropolitan city, as outlined in the 2020-2024 National Medium-Term Development Strategy (RPJMN) (dephub.go.id, 2021).

The Surabaya City Government within its capacity as regulatory authority is responsible for coordinating and overseeing various sectors, including the Surabaya City Transportation Department. The Surabaya City Transportation Department plays a role in regulating and managing various aspects of the transportation sector, including the development of transportation infrastructure, traffic regulations, public transportation services, and various programs to improve transportation efficiency and safety for the public use.

Since 2018, the Department of Transportation of Surabaya City has implemented various activities and policies. One of the government's programs include the operating of the Suroboyo Bus as a public bus service that connects various areas in Surabaya, including the city center, suburban areas, and hubs of economic activity. In addition, in 2022, the Trans Semanggi Electric Bus was also launched. However, the existence of the Suroboyo Bus and Trans Semanggi cannot yet reach all areas in Surabaya (Nurdiana & Wahyudi, 2023). This prompted

the Surabaya City Government to create a new innovation in the form of the Wira-Wiri Suroboyo Feeder transportation, which facilitates travel for public transportation users in Surabaya for areas difficult to access for big public buses such as Surabaya Bus and Trans Semanggi.

Wira-Wiri Suroboyo is a feeder transportation system that operates six strategic routes, created to connect routes where its service is beyond reach by Suroboyo Bus or Trans Semanggi Bus. Feeders have an important role in providing transportation access to areas not provided by main services so that they cater to support overall community mobility in the city of Surabaya. The Wira-Wiri Suroboyo Feeder began their service operation on March 3, 2023 and was approved by Eri Cahyadi, Mayor of Surabaya (Surabaya City Government, 2023). Currently, the Wira-Wiri Suroboyo Feeder fleet consists of 38 GranMax units, each with a passenger capacity of ten and 14 Hiace units, each capable of accommodating 14 passengers. The following are the routes of the Wira-Wiri Suroboyo Feeder:

Table 1. Wira Wiri Feeder Surabaya Routes

1	FD01	Terminal Benowo – Tunjungan
2	FD02	Mayjend Sungkono – Balai Kota
3	FD03	Terminal Intermoda Joyoboyo (TIJ) – Kedung Asem
4	FD04	Puspa Raya – HR Muhammad
5	FD05	Terminal Intermoda Joyoboyo (TIJ) – Lakarsantri
6	FD06	Terminal Bratang – Pasar Turi

Source: Wira Wiri Feeder Instagram

Wira Wiri Suroboyo transportation service is managed by the Regional Technical Implementation Unit (UPTD) for Public Transportation Management (PTU), which is under the auspices of the Surabaya City Transportation Agency. Coordination and supervision of this service are carried out by the Surabaya City Government. The feeder transportation system has been operating well since its implementation. This feeder transportation system provides very sufficient facilities to ensure the comfort and safety of passengers.

For approximately one year of service, Wira-Wiri Suroboyo has certainly undergone an in-depth review for the sustainability of public transportation in Surabaya. The evaluation included the addition of routes, route changes, and overall system improvements. The objective of this evaluation is to improve the accessibility and quality of feeder transportation services in the hope of providing convenience for the public in utilizing them. Improvements to the GOBIS Suroboyo application as an application integrated with existing public transportation services in Surabaya, including the Wira Wiri Suroboyo feeder are continuously being revised. However the GOBIS Suroboyo application is currently only accessible on the Android system and is not yet available for iOS system users, so not all people can access Wira Wiri Suroboyo through the GOBIS Suroboyo application. In addition, the addition of a payment feature via the application is expected to make it easier for people to transact when using public transportation services in Surabaya. This enhancement subsequently improves the overall quality of the Wira-Wiri Suroboyo program by elevating user comfort and convenience for both application and public transportation users. The evaluation results inform succeeding adjustments to the Wira-Wiri Suroboyo route, aligning it with passenger needs and potential to effectively reach target segments and maximize positive societal impact.

The objective of this study is to identify the operational existence of the Wira-Wiri Suroboyo Feeder in improving urban mobility in Surabaya using participant observation methods, in order to provide evaluation materials for the management system. Utilizing a participant observation methodology, this research presents a new paradigm for evaluating public transport service

efficiency. Through a detailed examination of the Wira-Wiri Suroboyo Feeder's operational performance, it provides critical insights into its contribution to urban mobility while uncovering latent systemic issues that traditional evaluation methods often overlook.

A. Literature Review

In Surabaya, Indonesia public transportation such as Wira Wiri Feeder service embodies an essential role, since it connects users to places, which could not be reached by the big Semanggi bus service. The aim of serving a good quality public transportation service holds a core role, since it was designed to provide last-mile connectivity and enhance the overall area of the city's public transit. However, the feeder services are reliant on their ability to meet passenger expectations and needs of service quality. When talking about the effectiveness of public transportation, the focus of the issue surrounds the quality of the service, for example for the accessibility of the information or the punctuality of the public transportation. The effectiveness of public transport such as Wira Wiri Feeder must include the user experience, whether the service is useful, usable or desirable from the perspective of the customer. Through user experience the quality of the public transportation service could be analyzed by observing the entire experience and understanding behavior in the real-world context where it happens Courage, C., & Baxter, K. (2015). In this study SERVQUAL theory was used to help with the categories of the analysis, while UX provides the depth of the service through user's experience through participatory observation. This study drew on SERVQUAL theory pioneered by Parasuraman, Zeithaml, and Berry (1998) to break down the service of Wira Wiri Feeder Surabaya. This model consists of the dimensions of Tangibles (Physical Evidence), Reliability, Assurance and Empathy. To evaluate the service of Wira Wiri Feeder through the perspective of the users this framework could help focus on the caring and individualized attention provided to the customers, to understand the user's need for convenience, comfort and hassle-free travelling. With the combination of Baxter's theory on user experience, we can capture authentic reactions and social interaction that users have during their use of Wira Wiri Feeder as a public transport. The SERVQUAL dimensions help to categorize the perception of the users during their whole experience. With the help of the SEVQUAL theory, it could ease the analysis on the public transportation service. In the tangibles (physical evidence) we analyze how the users interact with physical vehicles, whether the information of the public transport (route, map) is clear and usable. In relation to reliability, we analyze how the passengers react to the service performance such as punctuality and how it unpredictably affects their entire schedule. In the empathy dimension we focus on the individualized attention provided to the customers, for example observation on the condition of the public transport and customer's attraction to utilize public transportation and its functions. There is also the assurance dimension that refers to the knowledge and courtesy the public transportation service brought to customers trust and confidence, ultimately identifying the key determinants of passenger satisfaction critical to its improvement and integration into a seamless urban mobility ecosystem.

B. Public Transport

Transportation plays an essential role in moving individuals and goods from one location to another, facilitating access to various locations, and supporting the distribution of goods from source to destination. Public transportation, which involves the use of vehicles on a rented or paid basis, include city buses, minibuses, trains, water transportation, and air transportation (Haryanda et al., 2023). Effective public transportation plays a crucial role in sustainable urban development by providing necessary accessibility and connectivity, reducing air pollution, traffic congestion and dependence on private vehicles, thereby reducing the need for parking.

In addition, an effective and comfortable public transportation system can enhance social and economic mobility by improving access to employment centers, educational institutions, and other public amenities. As a result, it facilitates the creation of urban environments that are both more sustainable and aesthetically considerate. Moreover, public transportation is instrumental in regulating urban mobility regulation systems, reducing congestion, and increasing sustainability in metropolitan cities. The seamless integration of a high-quality, efficient public transportation network with key public amenities like healthcare facilities, educational institutions, and commercial centers improves overall accessibility and stimulates economic productivity. This study provides a systematic review of Transit-Oriented Development (TOD) and its role in enhancing sustainable urban mobility. (Yahia et al., 2025)

C. Wira-Wiri Feeder

The Wira-Wiri Suroboyo is a feeder transportation initiative intended to augment the existing Suroboyo Bus and Trans Semanggi Bus services. This program aims to establish a more comprehensive and interconnected public transportation network within the city of Surabaya. This program is designed to extend public transportation coverage to residential areas and narrow thoroughfares, thereby integrating these locations into the existing transportation network. Wira-Wiri Suroboyo implements location, schedule, and ticket integration with Surabaya Bus, although integration with Trans Semanggi Bus is still in the application stage (Hamida Annurya & Kurniawan Badrudin, 2023). The amenities provided include segregated seating arrangements for male, female, and disabled passengers, an air-conditioning system to ensure passenger comfort, closed-circuit television (CCTV) for security surveillance, and an automated door system designed to mitigate the risk of accidents. These vehicles are also equipped with identification stickers that restrict outward visibility, increasing passenger safety. The following are the Wira-Wiri Suroboyo Feeder fares:

Table 2. Wira Wiri Feeder Tariff

NO.	Type of ticket	Unit	Harga
1	General Passenger	Per person	Rp 5.000
2	Student	Per person	Rp 2.000
3	Veterans/elderly/children under 5 years old	Per person	Free

Source: Surabaya City Transportation Department, 2023

D. Public Transportation Performance

The Directorate General of Land Transportation (2002) evaluated the performance of public transportation systems across five key metrics: safety, comfort, speed, fares, and reliability. Based on Minister of Transportation Regulation Number 10 of 2012, safety is defined by specific aspects, including secure baggage storage, regulations for boarding and alighting at designated stops or terminals, and the presence of vehicle and security officer identification. Comfort is assessed by several factors, including the availability of seating, protection from adverse weather, adequate air circulation, proper lighting, and the cleanliness of hygiene facilities and floor space at both transit modes and stops. The ideal speed is designated as 10–12 km/h for high-density vehicles and 25 km/h for low-density vehicles. Fares are based on operational costs and the appropriateness of fares to the community's economic conditions. Reliability includes waiting time, service time, and the regularity of schedules and service information, with the ideal waiting time standard being 5-10 minutes, with a maximum of 20 minutes (Nugroho et al., 2018).

RESEARCH METHODS

The chosen methodology for this study was participant observation, which was deemed effective for acquiring a comprehensive and in-depth understanding of the operational efficacy of the Wira-Wiri Suroboyo Feeder. Participant observation is an in-depth ethnographic method used to understand specific situations and behaviors by directly participating in the activities, contexts, cultures, or subcultures being studied (Dwitasari et al., 2020). This study utilized participant observation, a qualitative research method in which the researcher actively participates in the subjects' daily lives to gain a more profound understanding of their experiences and behaviors. In this study, the researcher was actively involved in several operational facets of the Wira-Wiri Suroboyo Feeder. This included observing interactions between drivers and passengers, vehicle maintenance procedures, route management, and the collection of primary data on punctuality, comfort, and safety. The research was executed in a staged manner, employing participant observation as the primary methodology, which was structured into three distinct phases. The routes chosen for the participatory observation were the routes located at the intersections between other public transportation such as Suroboyo Bus, Trans Semanggi. The bus stops of FD07 and FD01 are located at intersections where the majority of passengers transit to the Wira Wiri Feeder to get to location that could only be accessed through the Wira Wiri Feeder service, thus in this participatory observations these bus stops were the main subjects to conduct the participatory observation. The following is the participant observation protocol implemented in this study:

Table 3. Observation Protocol Items

Observation Protocol	Information
Research Focus	Observations were made directly on the Wira-Wiri Suroboyo feeder program, which operates on several existing routes, and directly estimated waiting times, travel times, and transfers with other integrated public transportation. The research methodology applied observational techniques to evaluate the Wira-Wiri Suroboyo program. This study conducted non-participant observation of users to analyze technical implementation, aesthetic design, and layout. Concurrently, participant observation was undertaken to gain first-hand experience of the service. Furthermore, brief qualitative interviews were conducted to gather user feedback and to ascertain their motivations and objectives for using the feeder bus as a mode of daily transportation.
Observasi Time stamp	First Observation: Wednesday, October 4, 2023, 10:00 AM - 1:00 PM Second Observation: Saturday, November 4, 2023, 12:30 PM - 2:00 PM Third Observation: Tuesday, November 7, 2023, 6:00 PM - 7:30 PM
Tools	Cellphone
Unit of Analysis	- The overall condition of the feeder vehicle, including facilities (interior and exterior), environment, safety, and comfort. - Promotional strategies implemented by the feeder. - Feeder users' interest in using public transportation. - Estimated travel time and reasons for using the feeder. - Passenger conditions inside the feeder.

Source: Observation Ifanny 2024

In order to systemically categorize the units of analysis in this research, an analytical framework was framed through a joint theoretical domains such as the SERVQUAL model and user experience (UX) principles. The dimensions of SERVQUAL provide a validated, structured lens to classify various features of service quality. However, to dive into the depth and context of the passenger's experience, this framework was enhanced with a UX perspective, which prioritizes the user's journey, emotional responses and interpersonal dynamics with the Wira

Wiri Feeder service. Therefore, the units of analysis were defined not solely as service attributes but also as experiential touchpoints for passengers, allowing for a throughout analysis that bridges measurable service performance of the Wira Wiri Feeder service as public transportation.

RESEARCH RESULTS AND DISCUSSION

First Observation (Wednesday, October 4, 2023)

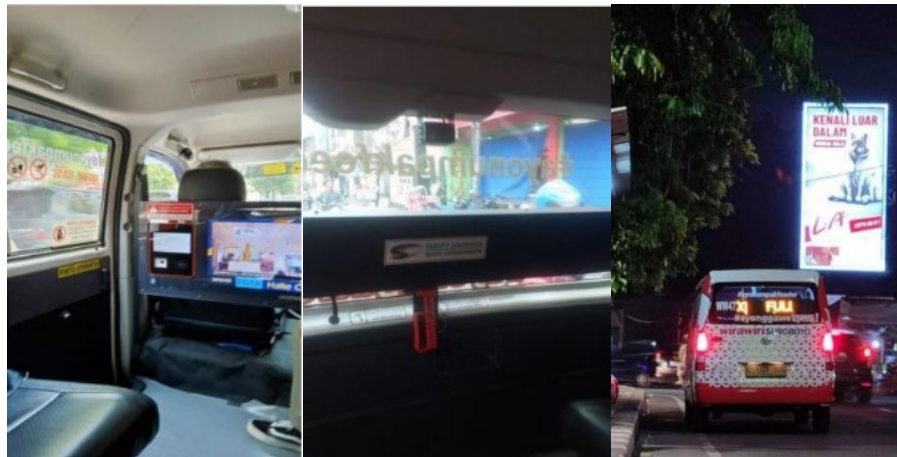
The first participant observation was conducted on Wednesday, October 4, 2023, from 10:00 AM to 1:00 PM. The routes of Wira Wiri Feeder observed for the first observation was the Wira Wiri Feeder Route FD07, which consists of the lanes through Bratang Terminal, Pemuda Bus stop, Pasar Turi Station and Surabaya City Hall. The observation period was 3 hours long which included 20 minutes of waiting time for the Wira Wiri Feeder and 20 minutes of driving hours from one stop to another for each stop and waiting time.

Table 4. First Participant Observation

Route FD07: Bratang Terminal → Pemuda Bus stop → Pasar turi Station → City Hall		
Waiting Time	20 minutes	waiting at the Pemuda Bus stop to transfer for the Wira Wiri Feeder to come from getting off Trans Semanggi Bus
Traveling Time	20 minutes	journey from Bratang Bus Stop to City Hall
Number of passengers	3 passengers (2 subscribed users and 1 new user)	on the way from Pemuda Bus Stop to Pasar Turi Station. There were no passengers on the return trip from Pasar Turi Station.
Delay Factor	The 30-minute integration between the Feeder and Trans Semanggi makes travel inefficient. As a result, people prefer to use private vehicles to maximize their travel efficiency. During the 30-minute wait for Trans Semanggi, the Feeder passes every 5 minutes and often stops at bus stops for approximately 2 minutes to ask prospective passengers where they want to go and offer the Feeder if the destination aligns with the Feeder's route.	
Facilities		
Comfort	The car is equipped with air conditioning and different colored seats for male, female and disabled passengers.	
Safety	There is CCTV inside the vehicle, but there is no audio system for bus stop notifications.	
others	The crew was very informative and helped passengers with payments and recommended stops; facilities were adequate, according to the information on the Instagram platform.	

Source: First Observation Ifanny 2024

Based on the experiences of the passengers, the Wira Wiri Feeder is less efficient for passengers who are in a rush; the facilities are adequate but without audio announcements for upcoming stops, the majority of passengers are elderly who receive free fares. The conclusion from the first participant observation is that the Feeder is already running quite well in terms of routes, travel time, facilities provided, and fairly informative drivers and crew. However, passenger travel is ineffective, especially in terms of time because the integration of time between the Feeder and other public transportation is not yet optimal and in sync with each schedule.



Picture 1. Documentation of Participant Observation of Wira-Wiri Feeder
Source : Dokumentation Baiti (2024)

Second Observation (Saturday, November 4, 2023)

The second participant observation was conducted on Saturday, November 4, 2023, from 12:30 to 2:00 PM.

Table 5. Second Participant Observation

Route FD01: Benowo Terminal → Tunjungan Busstop		
Waiting Time	20 minutes	at the Pemuda Bus Stop to wait for the feeder to transfer after getting off the Trans Semanggi Bus
Traveling Time	20 minutes	journey from Pemuda Bus Stop to Pasar Turi Station
Number of passengers	5 passengers (2 regular passengers, 1 adult male passenger, 2 mothers and toddlers). 2 passengers were already there from the start of boarding, 1 passenger was added in the middle of the trip, and 2 others were added at the end of the trip.	on the way from Pemuda Bus Stop to Pasar Turi Station. There were no passengers on the return trip from Pasar Turi Station.
Delay Factor	The feeder continues to operate smoothly despite heavy traffic; the estimated feeder arrival time is every 5 minutes.	
Facilities		
Comfort	The Feeder vehicles are equipped with air conditioning and seats with different colors for male, female, and disabled passengers. The seats are colored differently for male and female passengers, and there is priority seating for disabled passengers, but there is no written information like on Trans Semanggi or Suroboyo Bus..	
Safety	There's CCTV inside the vehicle, but no audio system for bus stop notifications. The car's windows are covered, limiting outward visibility, which can be distracting for passengers.	
others	The crew was very informative and helped passengers with payments and recommended stops; facilities were adequate, according to the information on the Instagram platform.	

Source: Second Observation Baiti 2024

Passengers experienced confusion when stopping because the feeder did not stop at all the bus stops it was informed on the Wira Wiri Feeder schedule, and complained about limited visibility out the car windows. The conclusion from the second participant's observation was that the

continuity of the Feeder's operation was not disrupted, but the Feeder did not stop at every stop, thus violating the existing standard operational procedure.

Third Observation (Tuesday, November 7, 2023)

Observations were conducted on Tuesday, November 7, 2023, from 6:00 PM.

Table 6. Third Participant Observation

Route FD01: Benowo Terminal→ Tunjungan Busstop.		
Waiting Time	20 menit	at the Pemuda Bus Stop to wait for the feeder after getting off the Trans Semanggi.
Traveling Time	20 menit	journey from Pemuda Bus Stop to Pasar Turi Station
Number of passengers	7 passengers (passengers are all aged 21-30 years, majority are employees)	on the way from Pemuda Bus Stop to Pasar Turi Station. There were no passengers on the return trip from Pasar Turi Station.
Delay Factor	The feeder continues to operate smoothly despite heavy traffic; the estimated feeder arrival time is every 5 minutes.	
Facilities		
Comfort	the GranMax feeder felt very crowded with passengers; knees rubbed against each other due to the facing seats. Passengers used their seats according to the rules; despite the crowded conditions, the feeder's air conditioning was quite good and comfortable.	
Safety	the majority of passengers are regular customers who are familiar with the drivers and feeder crew; payments are handled smoothly by the feeder crew.	
others	passengers grew concerned regarding the accuracy of Feeder tracking via the app, which disrupts waiting time planning and estimated arrival times.	

Source: Third Observation Baiti 2024

The conclusion of the third participant's observation was that Wira-Wiri Feeder passengers during their commute are of productive age and regular passengers, so they are quite familiar with the Feeder drivers and crew, as they see each other every day. Unfortunately, Feeder tracking via the app is not yet accurate, making it difficult to estimate the user's journey time.

CONCLUSION

Overall, the Wira-Wiri Suroboyo Feeder demonstrates several positive operational characteristics, notably its provision of sufficient and reliable transportation during peak hours. Fundamental amenities, including air conditioning and assistance from onboard staff, have enhanced passenger comfort despite high occupancy levels. However, observations indicate several key areas that require improvement to enhance operational effectiveness. The relatively long wait time of approximately 20 minutes is one issue that needs to be addressed to improve passenger satisfaction, particularly for those with limited time. Furthermore, the lack of an audio information system that can provide bus stop notifications also reduces convenience and can be confusing for passengers, especially for new users. Finally, inconsistent app tracking accuracy impacts passengers' ability to plan their trips effectively. Improvements in these areas would significantly contribute to improving the passenger experience and operational efficiency of the Wira-Wiri Suroboyo Feeder, making it more effective in supporting urban mobility in Surabaya.

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