

Urban Public Perceptions and Usage of the 'Wira-Wiri Suroboyo' Feeder: Insights from the Theory of Planned Behavior

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Abstract

Traffic congestion is a major transportation issue in Surabaya, prompting the city government to introduce solutions such as the "Wira-Wiri Suroboyo" feeder service. While the Theory of Planned Behavior (TPB) has been widely used to explain public transportation use, it has not yet been applied to this context. To fill this lacuna, this study used TPB to explore the public perceptions of the Surabaya to use or not using the "Wira-Wiri Suroboyo" feeder. A qualitative approach was used with six purposively selected participants. Data were gathered through interviews and analyzed using interactive techniques. The research findings indicate that the reasons for using or not using the "Wira-Wiri Suroboyo" feeder are significantly influenced by positive or negative evaluations of the feeder, the influence of significant others, and the perceived ease or difficulty of accessing the "Wira-Wiri Suroboyo" feeder. The participants recommended improvements, such as expanding routes, adjusting schedules, enhancing app use, and improving infrastructure and facilities. These insights can help the government improve the effectiveness of the service and contribute to easing traffic congestion.

Keywords

Congestion, public transportation, Surabaya, theory of planned behavior, urban public transportation, "Wira-Wiri Suroboyo" feeder

Rapid urban population growth in Surabaya has led to various urban challenges, particularly in the transportation sector. As of 2023, Surabaya's population reached 3,009,286 in 2023, with an annual growth rate of 0.42% (Dinas Kependudukan dan Pencatatan Sipil, 2023). Urban population growth drives higher demand for transportation services (Zhang & Xu, 2022). One major issue is the surge in private motor vehicle ownership, which has not been matched by adequate road infrastructure expansion. In 2022, INRIX, a U.S.-based company specializing in global traffic analysis, ranked Surabaya as Indonesia's second most congested city after

Jakarta. By 2023, Surabaya had the highest number of registered motorized vehicles in East Java, totaling 3,717,231 and representing 14.6% of the province's total (Korps Lalu Lintas Polri, 2024). This imbalance between vehicle growth and infrastructure capacity significantly worsens traffic congestion. Contributing factors include irregular stopping by public transportation, poor traffic light synchronization, road occupation by street vendors, and ongoing construction projects (Sitanggang & Saribanon, 2018).

Addressing these transportation issues is crucial for improving the mobility and urban livability of Surabaya. The government has implemented a progressive tax policy to mitigate traffic congestion, which imposes higher taxes based on the number or value of vehicles owned (Putri & Wibawa, 2023). However, this policy is considered ineffective because many individu-

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als register vehicles under the names of other people or companies to avoid higher tax rates (Noorca, 2023). A literature review by Soza-Parra and Cats (2024) found that the increasing ownership of motor vehicles, particularly cars, which are often associated with social status and self-esteem fulfillment, also drives congestion. Dealership incentives, such as discounts, installment plans, and bonus offers, further support rising consumer purchasing power.

To reduce traffic congestion, the Surabaya City Government launched the “Suroboyo Bus” in April 2018, operating from 05:30 AM to 09:00 PM WIB across Purabaya-Rajawali and Unesa-Oso Wilangun routes. Supporting features include the Golek Bis (GOBIS) app for real-time tracking, air conditioning, TVs, charging ports, CCTV, priority seating, and safety equipment (Haqie et al., 2020). Despite these improvements, Nurdiana and Wahyudi (2023) found that the bus service is perceived as ineffective in easing congestion, as many residents still prefer private vehicles for convenience, speed, and better accessibility. Additionally, the limited coverage and lack of dedicated lanes reduce the effectiveness of the system. A problem tree analysis by Aryanti and Aulia (2024) demonstrates that sharing lanes with other traffic may worsen congestion in buses.

The Surabaya City Government launched the “Wira-Wiri Suroboyo” feeder service in March 2023 to improve public transportation access. This service uses smaller vehicles and offers more flexible routes and easier access for residents. Several studies have examined this program. Hamida and Kurniawan (2023) analyzed its implementation through six variables, including policy objectives, resources, communication, and socio-political conditions. Nutri et al. (2024) assessed public service quality using five indicators: tangibles, empathy, assurance, responsiveness, and reliability. Meanwhile, Novantiko et al. (2024) explored the policy’s effectiveness in reducing traffic congestion and addressing transportation inequality by examining its supporting and limiting factors. These studies highlight the multi-faceted approach to evaluating and improving the “Wira-Wiri Suroboyo” feeder system.

While existing studies (Hamida & Kur-

niawan, 2023; Novantiko et al., 2024; Putri et al., 2024) have contributed valuable insights into the implementation and service quality of the “Wira-Wiri Suroboyo” feeder, they rely largely on evaluative and quantitative approaches. As such, they do not address the underlying psychological factors that influence the decision to use or avoid the service. Specifically, these studies did not examine how perceptions, social influences, and perceived barriers shape transportation choices. This creates a gap in the understanding of the behavioral motivations that drive public engagement with the feeder system. To address this, the present study applies TPB, a widely used framework for explaining voluntary behavior. By adopting this framework, this study aims to generate richer, more nuanced insights into user motivations, which can inform more effective, user-centered transportation policies in Surabaya.

The Theory of Planned Behavior (TPB), developed by Icek Ajzen (1985), is widely used in psychology to explain why individuals choose to engage—or not engage—in certain behaviors, particularly when the behavior is voluntary. TPB suggests that intention primarily drives behavior, which is influenced by three key factors: attitude, subjective norms, and perceived behavioral control. Attitude reflects one’s personal evaluation of the behavior; a positive view increases the likelihood of performing the behavior. Subjective norms involve perceived social pressure—people are more likely to act when they believe others expect or support the behavior. Perceived behavioral control refers to an individual’s sense of ease or difficulty in performing a behavior; greater perceived control enhances the likelihood of action. In this study’s context, positive perceptions, supportive social norms, and high perceived control may increase the use of the “Wira-Wiri Suroboyo” feeder service.

Numerous studies have applied the TPB to explain public transportation use in urban areas, particularly in Asian cities such as Hanoi, Vietnam (Ng & Phung, 2021); Kanazawa, Japan (Ali et al., 2023); Kuala Lumpur, Malaysia); Phnom Penh, Cambodia (Goh et al., 2022); Shanghai, China (Li et al., 2015; Zhang et al., 2016); and Calicut, India (Devika et al., 2020). Similar research has also been conducted in Eu-

ropean cities such as Falun, Sweden (Eriksson & Forward, 2011); Northern Cyprus (Angin et al., 2024); both rural and urban areas in northern and southern England (Donald et al., 2014); Limburg, the Netherlands (Lo et al., 2016); and Bochum and Dortmund (Bamberg et al., 2007). These studies consistently support TPB as a valid framework for understanding TPB, with intention as a key predictor of actual use. Factors such as service quality, reliability, and safety have been shown to strengthen the intention of individuals to use public transportation (Goh et al., 2022; Kalhor et al., 2021).

In Indonesia, the TPB has been applied to explain various transportation-related behaviors. Setiawan (2012) studied private car use among 50 university students in Surabaya, while Sene and Setiawan (2016) examined the use of motorized vehicles for commuting among 414 students across five campuses. Usaf (2012) explored the use of public transportation during the COVID-19 pandemic in Bandung. Additionally, Prasetyanto et al. (2021) investigated the shift from mini-buses to city buses among 100 respondents in Bandung. These studies demonstrate the relevance of TPB in understanding transportation choices within the Indonesian urban context.

In sum, traffic congestion is a major transportation issue in Surabaya. To address this, the city government has introduced public transportation options such as the "Suroboyo Bus" and the "Wira-Wiri Suroboyo" feeder service. The Theory of Planned Behavior (TPB) has been widely used in global and Indonesian studies to explain the usage of public transport (e.g. Ali et al., 2023; Sene & Setiawan, 2016). Research on the "Wira-Wiri Suroboyo" has mainly focused on policy implementation and service quality (Hamida & Kurniawan, 2023; Novantiko dkk., 2024; Putri dkk., 2024). However, to the best of our knowledge, no study has applied the TPB using a qualitative approach to explore why people choose this feeder service. To fill this lacuna, this study investigates the motivations behind the use of "Wira-Wiri Suroboyo" through the TPB framework, aiming to better understand its role in alleviating traffic congestion in Surabaya.

Methods

This study employed a qualitative design with an interpretive approach. This approach uses interviews as the primary method for in-depth exploration of participants' perceptions, values, and beliefs. The aim is to generate a rich and contextualized understanding of individuals' social reality in relation to specific experiences or phenomena within their social contexts (Creswell & Creswell, 2018).

Participants

The participants in this study comprised six informants selected through purposive sampling. The participants were chosen based on diverse demographic backgrounds, including age, occupation, and educational level. Four participants (A, B, E, and F) were regular users of the "Wira-Wiri Suroboyo" feeder transport, whereas the remaining two were non-users (C and D). Since the primary goal of the study was to explore both motivating and inhibiting factors influencing service use, individuals with sufficient user experience were prioritized. However, we also included non-users to provide insight into perceived barriers and reasons for non-adoption. To identify participants A-F, we directly approached prospective informants who fit the criteria in public spaces such as bus stops, university campuses, and office areas. Brief screening questions were then used to confirm their suitability. This process ensured that the final sample represented both active and potential users of the service. All participants in this study were selected based on the following criteria: (1) aged between 18 and 50 years, (2) currently residing in Surabaya, and (3) actively engaged in either academic (as university students) or professional (as office workers) settings. These criteria were chosen to ensure that participants had relevant daily mobility needs and could provide insights into the practical use or non-use of the "Wira-Wiri Suroboyo" feeder service.

Measures

Semi-structured interviews were used to explore users' perceptions of the "Wira-Wiri Suroboyo" feeder service. In-depth interviews were conducted with six purposively selected participants, guided by open-ended questions that allowed for the exploration of their views and experiences. The interview guide consisted of open-ended questions covering three main domains

based on the TPB: attitudes toward the feeder service, subjective norms (social influence), and perceived behavioral control (ease or barriers in using the service).

Procedure

Six participants who met the inclusion criteria were contacted directly and provided with an explanation of the study's objectives and procedures. Before the interview, each participant signed an informed consent form as an indication of their voluntary participation. The interviews were conducted face-to-face at mutually agreed-upon locations, such as bus stops, university campuses, or quiet public areas. Each interview lasted approximately 30–45 minutes and was audio-recorded with the participants' permission.

Data Analysis

The interview data were transcribed verbatim and analyzed using interactive thematic analysis. This method involves the active engagement of the researcher in collecting, interpreting, and drawing conclusions from the data by applying relevant theoretical frameworks (Sugiyono, 2016). Interactive thematic analysis enables the researcher to obtain rich and contextual insights into the motivations for and barriers to using the feeder service. In this study, public behavior regarding transportation mode choices was classified according to the TPB, which posits three antecedents of intention that influence behavior: attitude, subjective norm, and perceived behavioral control. The analysis was conducted in three stages: data reduction, data display, and conclusion drawing (Creswell & Creswell, 2018).

Results and Discussion

This study aimed to explore individuals' preferences between using and not using the "Wira-Wiri Suroboyo" feeder service, the factors influencing their decision to use or not use the service, and their perceptions of its role in reducing traffic congestion. Initially, the researcher posed exploratory questions to participants regarding their choice of transportation mode and the reasons behind it. The interview findings revealed that four of six participants had previously used the "Wira-Wiri Suroboyo" feeder service. In this study, public perceptions of their chosen mode of transportation were categorized based on the

three main components or antecedents of intention that influence behavior according to the TPB: attitude, subjective norm, and perceived behavioral control.

Attitude Toward the "Wira-Wiri Suroboyo" Feeder

Attitude is closely related to an individual's perception of something, whether it has positive or negative consequences (Ajzen, 1985; Tondok et al., 2012). A positive attitude toward the "Wira-Wiri Suroboyo" public transportation service increases the likelihood that an individual will use it again. Conversely, a negative attitude reduces the likelihood of future use. Except from Participant A, a private sector employee who uses the "Wira-Wiri Suroboyo" feeder service on the Gunung Anyar–Tandes route for commuting to and from work.

The inside of the vehicle is very comfortable. In terms of price, it is very reasonable compared to taking a Grab. The "Wira-Wiri Suroboyo" passes through small streets, making it accessible to areas that are hard to reach by the 'Suroboyo Bus.' In terms of timing, I feel that it arrives punctually as shown on the app (Kondisi di dalam mobil sangat nyaman. Dari segi harga, sangat oke dibandingkan naik Grab. Dari segi rute, "Wira-Wiri Suroboyo" melewati jalan-jalan kecil sehingga bisa menjangkau area yang sulit dilewati "Bus Suroboyo." Dari segi waktu, saya merasa datangnya tepat waktu sesuai aplikasi). (Participant A, female, private sector employee)

In addition, participant B, a university student who uses the "Wira-Wiri Suroboyo" under certain conditions, responded.

"Wira-Wiri Suroboyo" is on time according to the schedule shown in the app. In terms of price, I think it is cheaper than taking a Grab. The route is quite different from the 'Suroboyo Bus,' which only passes through major roads, making it easier to reach destinations that are not accessible by bus. However, the downside is that "Wira-Wiri Suroboyo" has yet to pass through my campus. This is the main reason I do not consider it my primary mode of transportation. ("Wira-Wiri Suroboyo" cukup on time sesuai dengan jadwal di aplikasi. Dari segi harga, menurutku lebih murah dibandingkan naik Grab. Dari segi rute, sangat berbeda dengan

'Suroboyo Bus' yang hanya melewati jalan-jalan besar, sehingga mempermudah untuk menuju tujuan yang tidak terjangkau oleh bus. Akan tetapi, yang disayangkan adalah "Wira-Wiri Suroboyo" belum melewati kampus saya. Hal ini yang menyebabkan saya tidak menjadikan "Wira-Wiri Suroboyo" sebagai moda transportasi utama). (Participant B, woman, university student)

Participant E, another user of the "Wira-Wiri Suroboyo," also expressed a positive response. Participant E uses the service as their primary mode of transportation for commuting to work.

I choose to use the "Wira-Wiri Suroboyo" service for commuting to work because it passes both my residence and workplace. Outside working hours or when going out for leisure, I prefer to use a private vehicle. As a user, I find the "Wira-Wiri Suroboyo" service satisfactory, as it is punctual and contributes to reducing traffic congestion. (Saya memilih untuk naik "Wira-Wiri Suroboyo" saat bekerja karena tempat tinggal dan tempat kerja saya dilalui "Wira-Wiri Suroboyo." Saat di luar jam kerja atau saat jalan-jalan, saya menggunakan kendaraan pribadi. Sebagai pengguna, menurutku, "Wira-Wiri Suroboyo" sudah memuaskan karena sudah tepat waktu dan bisa mengurangi kemacetan). (Participant E, woman, private sector worker)

The interview with participants A and E, who had previously used "Wira-Wiri Suroboyo," revealed a positive evaluation of this public transportation mode in Surabaya. This aligns with the theory of planned behavior, which posits that positive experiences shape favorable attitudes toward an object, thereby increasing an individual's intention to engage in a particular behavior (Ajzen, 1985). Participant B also expressed a positive view of "Wira-Wiri Suroboyo" but felt that its limited route coverage made it less accessible from their location. As a result, they opted to use it only occasionally. This finding is consistent with those of previous studies on public transit use, which highlight attitude as a key antecedent of the intention to use public transit (Donald et al., 2014; Eriksson & Forward, 2011; Ng & Phung, 2021; Zailani et al., 2016).

Meanwhile, two participants expressed negative attitudes toward the "Wira-Wiri Suro-

boyo" public transportation. The following is an excerpt from an interview with Participant C, an office worker who has never used the "Wira-Wiri Suroboyo" service.

I am already used to driving and find it more practical. Upon reviewing the "Wira-Wiri Suroboyo" schedule, I found it to be insufficiently flexible. (Saya sudah terbiasa dan lebih praktis mengendarai mobil pribadi. Ketika saya melihat jadwal "Wira-Wiri Suroboyo" saya merasa kurang fleksibel). (Participant C, female, private sector worker)

Participant D also expressed a negative response regarding public transportation.

I perceive using public transportation in Surabaya is unsafe. This makes me prefer to use a private vehicle. (Saya merasa menaiki transportasi umum di Surabaya kurang aman. Hal ini menyebabkan saya lebih memilih naik kendaraan pribadi). (Participant D, woman, university student)

In line with the TPB, the two excerpts above demonstrate that when individuals hold negative attitudes toward public transportation, they are more likely to reject its use. Participant C preferred using private vehicles over public transportation such as "Wira-Wiri Suroboyo" due to being accustomed to private modes of transportation. Habitual use of a particular mode of transportation is one of the key factors discouraging individuals from shifting to alternative modes (Chen & Tung, 2014; Fu & Juan, 2017). Attitudinal components related to speed, freedom, and comfort are significant antecedents of the intention to use public transportation (Devika et al., 2020; Li et al., 2015).

Subjective Norm

An individual's decision to enact or not enact a particular behavior is strongly influenced by those closest to them or by individuals who serve as behavioral referents (significant others) and are deemed important or significant. When these significant others engage in the behavior themselves or, at the very least, evaluate the behavior positively, the individual is more likely to adopt the behavior (Ajzen, 1985). Participant A stated that their parents occasionally use public transportation in the interview.

My father and mother sometimes take public

transportation when they feel tired of driving themselves. They usually take the "Suroboyo Bus". That's why I also do the same—I occasionally use public transportation. (Kadang papa dan mama naik transportasi umum kalau sedang capek menyetir sendiri. Biasanya mereka naik "Suroboyo Bus." Makanya saya juga seperti itu, sesekali naik transportasi umum). (Participant A, woman, university student)

Participant D, who has never used public transportation, provided the following response:

Both my parents and other family members use private vehicles for commuting. (Kedua orang tua saya dan anggota keluarga lainnya menggunakan kendaraan pribadi untuk bepergian). (Participant D, woman, university student)

The interview data above indicate that the decision of participant A to use and participant D to not use, the "Wira-Wiri Suroboyo" feeder public transportation was influenced by social factors—namely, the people closest to them. This finding aligns with previous studies that have shown that subjective norms strongly influence the intention to use public transportation (Ali et al., 2023; Donald et al., 2014; Eriksson & Forward, 2011; Goh et al., 2022; Zhang et al., 2016).

Perceived Behavioral Control

Perceived behavioral control refers to an individual's perception of the factors that facilitate or hinder a specific behavior's performance (Ajzen, 1985). Factors such as accessibility, cost, ease of use, safety, and comfort play a critical role in shaping the perceptions of individuals when choosing public transportation. In terms of accessibility, participant F hoped that the "Wira-Wiri Suroboyo" route would be expanded to include campus areas, as this would offer substantial benefits for students.

The routes could be expanded further, especially toward campus areas, so that students can get to campus more affordably and quickly. (Bisa diperbanyak lagi rutenya, terutama untuk ke arah kampus-kampus. Supaya para mahasiswa bisa ke kampus lebih hemat dan cepat). (Participant F, woman, university student)

Regarding accessibility, Participant B expressed disappointment that the "Wira-Wiri

Suroboyo" route does not pass through their university area, making it difficult to rely on this mode of transport consistently. Participant C also expressed a similar view.

My colleague is usually one of the earliest to arrive at the office. The reason for this is that she needs to catch the scheduled departure of the "Wira-Wiri Suroboyo" feeder. If she is even slightly late in boarding the feeder, she also ends up arriving late to work. According to her, there is a considerable waiting time between one "Wira-Wiri Suroboyo" service and the next. (Teman sekantor saya merupakan salah satu orang yang paling cepat sampai di kantor. Alasannya Adalah ia perlu mengejar jadwal keberangkatan "Wira-Wiri Suroboyo." Jika terlambat sedikit untuk naik ke feeder "Wira-Wiri Suroboyo," maka teman saya juga akan sampai ke kantor dalam keadaan telat. Menurut teman saya ada jeda waktu yang cukup lama untuk menunggu kedatangan Wira-Wiri Suroboyo selanjutnya). (Participant C, female, private sector worker)

In addition, Participant D believes that the "Wira-Wiri Suroboyo" service is not safe.

Some of my friends use public transportation. They say it is safe and comfortable. I agree that it looks comfortable, but I am not so sure about safety. (Beberapa teman saya menggunakan transportasi umum. Mereka mengatakan bahwa aman dan nyaman. Saya setuju kalau terlihat nyaman, tetapi kalau aman saya kurang setuju). (Participant D, woman, university student)

Perceived behavioral control refers to individuals' perceptions of factors that facilitate or hinder their ability to choose and use public transportation, specifically the "Wira-Wiri Suroboyo" feeder service. The findings indicate that participants reported low perceived behavioral control because the current system does not adequately support flexibility, accessibility, or safety. This lack of control reduces their intention to use the "Wira-Wiri Suroboyo" feeder service. In turn, this intention influences their actual behavior. The findings of this study indicate that perceived behavioral control—such as the availability and reliability of public transport—serves as an antecedent to the intention and behavior of selecting and using public transportation (Ali et al., 2023; Devika et al., 2020; Fu & Juan, 2017; Kalhor et al., 2021; Zailani et al., 2016; Zhang et

al., 2016).

Based on the interview data, participants offered feedback that, from the theoretical perspective of the TPB, is closely related to perceived behavioral control. These insights provide valuable input for the Surabaya City Government to enhance the effectiveness of PTS in four key areas. First, route expansion: All six participants hoped that the "Wira-Wiri Suroboyo" feeder would serve more strategic locations, such as campuses, shopping centers, and densely populated neighborhoods. Second, schedule adjustments: In line with participant C's comment on time pressure, increasing bus frequency—especially during peak hours—could reduce waiting times. As indicated in the GoBis app, ensuring punctuality is also essential. Third, technology utilization: Although GoBis integrates several transport services, users reported difficulties with its interface, citing design, font, and usability issues (Fitriaruli & Suyatno, 2024). Moreover, the app is currently unavailable for iOS users, limiting access to real-time tracking (Permata & Tukiman, 2023). Fourth, Infrastructure and facilities: Participant A recommended increasing the number of feeder units. Participant B raised concerns about odor and ventilation, proposing improvements in air circulation and cleanliness. Participant D highlighted safety concerns that could be addressed through the installation of surveillance cameras on buses and at stops. Collectively, these suggestions aim to improve user experience and encourage greater use of public transport.

Limitations and Future Research

This study has several limitations that should be acknowledged. First, the small sample size of six participants limits the generalizability of the findings to a broader population of public transportation users in Surabaya. Second, all participants were women, which may introduce gender bias, as male users and non-users may have different experiences and perspectives. Third, the data were based solely on self-reported interviews, which are subject to personal bias, memory limitations, and social desirability effects. These limitations highlight the need for future research to involve a larger and more diverse sample, including participants of different

genders and backgrounds. Additionally, combining qualitative and quantitative methods could improve the validity and richness of the findings. A mixed-methods design, supported by survey data developed from the themes identified in this study, would also help enhance the generalizability and practical relevance of future research outcomes.

Conclusions

This study confirms that the public perceptions of the "Wira-Wiri Suroboyo" public transportation service are influenced by individual (personal attitudes), social (social norms), and situational factors that affect perceived behavioral control. The findings highlight the importance of considering all three components of the TPB in efforts to promote the use of public transportation in Surabaya. Enhancing accessibility, schedule flexibility, infrastructure, and comprehensive technological integration can improve PBC. These improvements may encourage more individuals to use public transportation such as "Wira-Wiri Suroboyo". Such strategies are expected to increase public interest in using public transportation and reduce traffic congestion in Surabaya.

Conflict of interest. The authors declare that there is no conflict of interest with regard to the authorship and the publication of the manuscript.

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