Assessment of Bus Stop Infrastructure on Trans Metro Pekanbaru Corridor 1 and Corridor 3 Based on National Transit Standards

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Abstract

Trans Metro Pekanbaru (TMP) is the main public transportation system in Pekanbaru, Indonesia. A critical component supporting the quality of TMP services is the condition and adequacy of its bus stops. This study examines the adequacy of bus stop infrastructure in Corridor 1 (Pandau–Pelita Pantai) and Corridor 3 (UIN Suska–Akses Sudirman Awal Bros) based on national public transportation service standards. This study uses primary data through field observations and secondary data from the Pekanbaru Transportation Agency. The main elements evaluated include physical facilities, service information, spatial planning, and compliance with regulatory standards. The results show that both corridors are lacking in providing adequate passenger facilities and information, with most bus stops categorized as poor. Corridor 1 performs better, especially in terms of bus stop layout and infrastructure quality, due to its alignment through the city center where new facilities have been built. This study highlights the urgent need for improved standards across all TMP corridors to improve public transportation usability and passenger satisfaction.

Keywords: *Trans Metro Pekanbaru, Bus stop infrastructure, Corridor analysis, Transit service standards, Urban mobility.*

1. Introduction

Public transportation systems play a fundamental role in improving urban mobility, supporting economic development, and fostering environmental sustainability. In many Indonesian cities, Bus Rapid Transit (BRT) systems have been introduced to address increasing transportation demand and traffic congestion [1], [2]. One such initiative is Trans Metro Pekanbaru (TMP), launched in 2009, which operates several corridors to serve the public within Pekanbaru City [3].

Despite its intentions to provide efficient and accessible public transportation, TMP has faced challenges, particularly regarding its supporting infrastructure, most notably bus stops. Common issues reported by users include inconsistent service schedules, lack of proper signage, absence of shelter and seating, and limited-service information [4], [5]. These shortcomings directly impact passenger satisfaction and service utilization.

According to the Indonesian Ministry of Transportation Regulation No. PM 10 of 2012, urban public transport systems must comply with six minimum service standards: safety, security, comfort, accessibility, affordability, and regularity [10]. In addition, local policies such

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as Pekanbaru emphasizes Regulation No. 10 of 2017 emphasize the adequacy and maintenance of public transport infrastructure. However, studies have indicated that many TMP bus stops, particularly along Corridor 1 (Pandau–Pelita Pantai) and Corridor 3 (UIN Suska–Sudirman Awal Bros), do not meet these standards in practice [6]–[8].

Previous studies have examined infrastructure-related issues in BRT systems in various Indonesian cities. For example, poor spatial planning, minimal shelter facilities, and lack of route maps and lighting have been frequently noted [5], [6], [9]. These deficiencies reduce the attractiveness of public transport systems and contribute to the persistence of private vehicle use.

This study aims to evaluate the condition and compliance of TMP bus stops along Corridors 1 and 3 with the national public transport infrastructure standards. The evaluation includes aspects such as bus stop layout, spacing, signage, service information, shelter provision, and accessibility features. The findings are intended to support urban transport policy formulation and infrastructure improvement strategies for sustainable and user-oriented public transport systems in Pekanbaru.

2.   Methodology

2.1.   Study Area and Data Sources

The study was conducted in Pekanbaru with a focus on two main service corridors of TMP:

- Corridor 1: Pandau – Pelita Pantai
- Corridor 3: UIN Suska – Akses Sudirman Awal Bros

These corridors were chosen because of their high passenger volume and their strategic role in connecting residential, educational, and commercial areas.
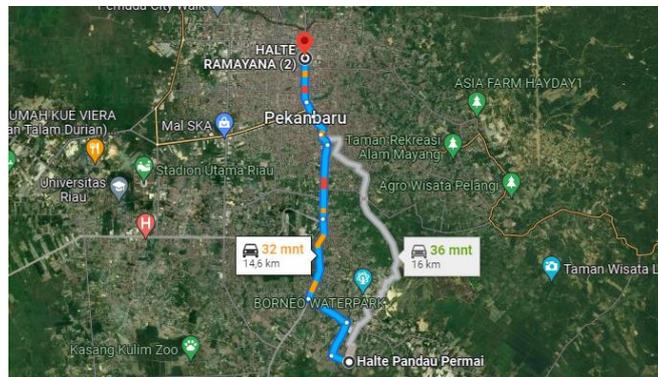
Source : Google Map, 2022

Figure 1. Corridor Research Location 1 (Ramayana Sudirman – Pandau Jaya)
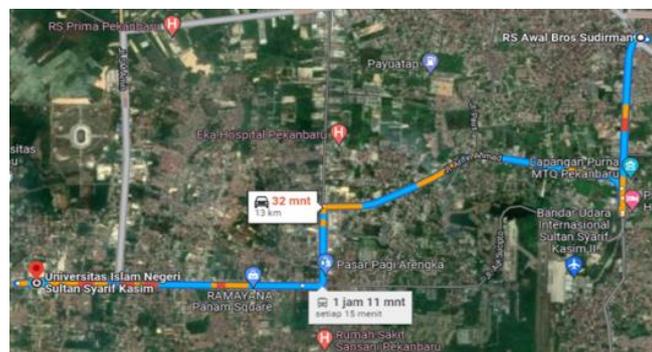
Source: Google Map, 2022

Figure 2. Corridor Research Location 3 (Campus UIN – Awal Bros Sudirman)

Heri Saputra, Neri Puspita Sari, Yulia Setiani, Silfia Rini

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Table 1. Pekanbaru Trans Metro Bus Corridor

No.	Corridor	Number of Buses Operating	RIT	Headway (Menit)
		2020	2020	2020
1	01 (Pandau - Ramayana)	10	7	10 - 15
2	1A (Awal Bros- Bandara)	2	14	20
3	02 (Term BRPS - Kulim)	10	6	10 - 15
4	03 (Awal Bros - Kampus UIN)	10	7	10 - 15
5	4A (Ps. Tangor - Ramayana)	8	8	20
6	4B (Ramayana - Term. BRPS)	6	8	20
7	4C (Walikota Sudirman - Walikota Tenayan)	3	7	20 - 30
8	05 (Pelabuhan Sei Duku - Sudirman)	3	11	15 - 20
9	06 (Pandau - Term BRPS)	6	6	20
10	7A (Pujasera Arifin Ahmad - Tri Bakti)	2	12	15 - 20
11	7B (Pujasera Arifin Ahmad - Puskesmas Simp Tiga)	3	9	15 - 20
12	8A (Kantor Wali Kota- Stadion Rumbai)	6	6	20 - 30
13	8B(Stadion Rumbai - Palas Raya)	2	9	20
14	09 (BRPS - Kampus UIN)	2	9	15 - 20
15	10 (Ramayana - UNILAK)	2	9	15 - 20

Source : Dishub Pekanbaru, 2020

2.2. Data Collection

Data collection was conducted through three main techniques:

- Field Observation: Structured checklists were used to record the condition of bus stop facilities. Observers evaluated each stop based on visual inspection and measurement.
- User Interviews: Informal interviews with TMP users were conducted at selected bus stops to gather perceptions about the infrastructure and service quality.
- Secondary Data: Supporting documents were obtained from relevant local agencies, including TMP operational records, city transport plans, and applicable regulatory frameworks.

2.3. Assessment Criteria

The evaluation was based on the Indonesian Ministry of Transportation Regulation No. PM 10 of 2012 and TPKPU Technical Guidelines (1996). The assessment focuses on five main components:

- Facilities Infrastructure: Including availability and condition of lighting, trash bins, security signage, floor height alignment with bus entry, and non-slip surface texture.
- Service Information: Availability of clear route maps, bus stop names, and bus arrival schedules.
- Layout and Placement: Evaluated based on the stop's distance to intersections, proximity to pedestrian crossings, and its location relative to sensitive buildings (e.g., hospitals, schools, and places of worship).
- Bus Stop Spacing: Measured against TPKPU guidelines, which recommend a distance of 200–400 meters between stops in urban areas.

- Capacity and Dimensions: Evaluated based on TPKPU Technical Guidelines 1996, which require stops to accommodate at least 10 seated and 10 standing passengers, with a minimum area of 4 × 2 meters.

2.4. Scoring System

Each element was assessed and given a score ranging from 0 to 10, with the following categorizations:
- Poor: 0–3
- Fair: 4–6
- Good: 7–10

An overall score was calculated for each stop by averaging all component scores. The results were then used to classify the general condition of the bus stop infrastructure and to identify improvement priorities.

2.5. Data Analysis

The collected data were analyzed using descriptive statistical methods, including mean scores, frequency distributions, and percentage analysis. Qualitative insights from field observations and interviews were also integrated to provide context and support for quantitative findings.

3. Results and Discussion

3.1. Main Facilities and Additional Facilities of Bus Stops

Both corridors showed deficiencies in basic facilities. Corridor 1 performed slightly better than Corridor 3. Lighting averaged 4.20–5.91 on Corridor 1 and 2.12–3.21 on Corridor 3. Waste bin availability ranged from fair to poor. No stops displayed the mandatory security stickers.
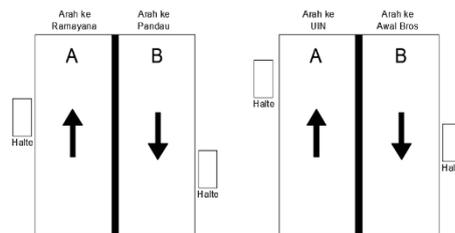
Source: Research, 2022
Figure 3. Direction Notation

Table 2. Facility Element Condition

Element	Corridor 1		Corridor 1II	
	Mark		Mark	
	1.B	1.A	3.B	3.A
Lamp Lighting	4.20	5.91	3.21	2.12
Security Breach Information	0.00	0.00	0.00	0.00
Rubbish bin	4.92	5.87	3.85	3.74
Floor Height of the bus stop	7.80	8.22	8.29	8.84
Special floor slope and texture	2.80	3.04	2.87	3.25

Source: Research, 2022

Based on Table 2, the evaluation of bus stop facilities along Corridor 1 and Corridor 3 revealed several important findings. Each score represents the average condition of bus stop elements in both directions of travel, denoted as A and B. The lighting element in Corridor 1

Heri Saputra, Neri Puspita Sari, Yulia Setiani, Silfia Rini

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scored 4.20 (1.B) and 5.91 (1.A), while Corridor 3 scored much lower at 3.21 (3.B) and 2.12 (3.A). These results indicate that most bus stops in Corridor 1 have adequate lighting conditions, while stops in Corridor 3 are in the poor category. The difference may be due to the presence of a new bus stop infrastructure along Corridor 1, especially in the central urban area.

The safety information element, which refers to the presence of at least two safety-related stickers, scored 0.00 in all locations. This indicates the absence of this element in both corridors, indicating non-compliance with the Regulation of the Minister of Transportation No. PM 10 of 2012.

Regarding the availability of trash bins, Corridor 1 received a sufficient score of 4.92 (1.B) and 5.87 (1.A), while Corridor 3 again received a poor score of 3.85 (3.B) and 3.74 (3.A). Field observations showed that several trash bins were missing or damaged, especially along Corridor 3.

Floor height arrangement, which measures the suitability of the platform height relative to the bus entrance, is one of the elements with the best performance. Corridor 1 received a score of 7.80 (1.B) and 8.22 (1.A), while Corridor 3 received a higher score of 8.29 (3.B) and 8.84 (3.A), so that both corridors are included in the "good" category. This shows that most bus stops are aligned with the passenger boarding area, thus increasing accessibility.

In contrast, floor slopes and textured surfaces, which are intended to ensure safety and accessibility, are not implemented adequately. Scores for this element remained in the poor category for both corridors: 2.80 and 3.04 for Corridor 1; 2.87 and 3.25 for Corridor 3. Only a small number of modern bus stops, especially on Corridor 1, have this safety feature.

Overall, the analysis shows that Corridor 1 generally offers better infrastructure conditions than Corridor 3, particularly in terms of lighting, waste disposal, and accessibility features. However, both corridors show critical gaps in meeting national transit facility standards, particularly in safety communications and floor safety design.

3.2 Service Information

Service information refers to the essential data displayed at bus stops, enabling passengers to access route-related details and plan their journeys efficiently. In this study, the evaluated elements include stop names, route and corridor information, transfer points and terminals, arrival/departure schedules, and network maps.

Table 3. Observation Results of Bus Stop Service Information

Element	corridor 1		corridor 1II	
	Mark		Mark	
	1.B	1.A	3.B	3.A
Bus stop name	8.56	8.12	8.87	8.72
Arrival and departure schedule	0.00	0.00	0.00	0.00
Routes and corridors	3.43	3.24	2.14	2.29
Corridor and terminal relocation	3.43	3.24	2.14	2.29
Service corridor network map	3.43	3.24	2.14	2.29

Source: Research, 2022

As presented in Table 3, the bus stop name element obtained the highest average scores in both corridors, with Corridor 1 obtaining scores of 8.56 (1.B) and 8.12 (1.A), and Corridor 3 obtaining slightly higher scores of 8.87 (3.B) and 8.72 (3.A). These results fall into the "good" category, indicating that most bus stops—regardless of type—display their names clearly, which positively contributes to user orientation. In contrast, the arrival and departure schedule element obtained a score of 0.00 across all segments. This total absence indicates a major deficiency in user information services, as passengers do not receive any official reference for estimated bus times—affecting reliability and satisfaction. Route and corridor information elements, transfer points and terminal references, and network maps received

Assessment of Bus Stop Infrastructure on Trans Metro Pekanbaru Corridor 1 and Corridor 3 Based on National Transit Standards

similar and consistently low scores across both corridors. Corridor 1 recorded an average score of around 3.43–3.24, while Corridor 3 scored even lower at 2.14–2.29. These ratings indicate poor service in terms of route guidance and network understanding. Field observations confirmed that such information is only available at a small number of newly constructed bus stops, while older and non-permanent stops often lack these features altogether. The analysis highlights that, beyond basic bus stop name identification, the broader information ecosystem supporting the TMP system is still underdeveloped. Limited route maps, terminal connection data, and timetable information undermine the overall functionality of the public transport experience. To improve service quality and encourage public transport use, comprehensive and standardised information elements should be installed at all bus stops, including digital and printed formats that comply with national public transport service standards.

3.3 Spatial Layout and Bus Stop Spacing

The layout of each bus stop was evaluated based on its compliance with zoning regulations, specifically the required distance from intersections—either before or after the intersections as well as its proximity to noise-sensitive facilities such as places of worship and hospitals that require a quiet environment.

- Layout Based on Distance at Intersections
  The results of observations of the layout of bus stops based on the distance to intersections that do not meet the requirements can be seen in Table 4. and Table 5.

Table 4. Observation Results of Distance of Bus Stops Before Intersections

Corridor	Bus Stop Name	Distance Before Intersection
		Minimum 50 m
1	Halte KUD Riau	26,33 m
3	Halte Bakti 2 Csi	27,34 m
3	Halte Pemadam Kebakaran	40,41 m
3	Halte Helvetia 1	19,84 m

Source: Research, 2022

Based on Table 4, there are all bus stops that do not meet the requirements.

Table 5. Observation Results of Distance of Bus Stops After Intersection

Corridor	Bus Stop Name	Distance After Intersection
		Minimum 20 m
1	Halte Kasah	10,03 m
1	Halte Gramedia	10,12 m

Source: Research, 2022

For the distance of the bus stop after the intersection, there are 2 bus stops on corridor 1 that do not meet the requirements, while in corridor 3 all bus stop layouts meet the requirements. The list of bus stops that do not meet the requirements and their conditions can be seen in Table 5.

Heri Saputra, Neri Puspita Sari, Yulia Setiani, Silfia Rini

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- Layout Based on Building Distance
  Many bus stops did not comply with spacing standards. Corridor 3 had the highest number of violations in placement near intersections and sensitive buildings (e.g., hospitals, places of worship). Out of 47 stops in Corridor 1, only 16 (34%) complied with inter-stop distance standards. Corridor 3 had a worse performance, with only 9 of 44 (20%) in compliance. Additionally, several stops violated proximity limits to intersections and sensitive buildings (e.g., Awal Bros Hospital, <100m).

3.4   Bus Stop Capacity

All permanent bus stops met dimensional requirements (length >4 m, width >2 m) and could accommodate up to 20 passengers. However, temporary bus stops were not available. Comparison: Corridor 1 generally outperformed Corridor 3, likely due to its central location (Jl. Sudirman), which received more infrastructure investment. Most stops with shelters meet the 20-person capacity and dimension criteria. However, many non-permanent or stair-type stops failed to meet comfort and accessibility standards.

4.   Conclusion

This study aims to evaluate the compliance of bus stop infrastructure along Corridors 1 and 3 of the Trans Metro Pekanbaru (TMP) system with national and local transportation standards. As expected from the problem identification in the introduction, the results confirm that most bus stops in both corridors do not meet regulatory benchmarks, particularly in terms of service information, physical infrastructure, accessibility, spatial layout, and stop spacing. The findings indicate that Corridor 1 outperforms Corridor 3 in several key aspects, particularly in the availability of seating, shelters, and better accessibility features such as ramps and pedestrian paths. However, significant gaps remain in both corridors regarding basic facilities such as lighting and trash bins, as well as the absence of important service information such as route maps and arrival schedules. Many bus stops also deviate from the recommended distance range of 200–400 meters outlined in the TPKPU Technical Guidelines, thereby reducing operational efficiency and passenger comfort.

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Heri Saputra, Neri Puspita Sari, Yulia Setiani, Silfia Rini