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User Centered Governance and Digital Integration for Inclusive Public Transport: Insights from Palu City

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ABSTRACT: Urban transportation in mid-sized cities often faces declining reliability and inclusivity. This study examines Palu City, Indonesia, where conventional public transport has sharply decreased while app-based services dominate user preference. Using a qualitative descriptive approach with 42 informants including commuters, drivers, officials, and civil society representatives data were collected through interviews, observations, and document review. Findings show that angkot and BRT services suffer from unreliable schedules, poor vehicle conditions, and limited accessibility, especially for elderly and disabled users, while app-based services achieve satisfaction above 90% due to convenience and transparency. Governance constraints include fragmented policies, limited funding, and lack of digital tools. The study recommends four key reforms: (1) user-centered service standards on reliability and safety; (2) inclusive infrastructure with universal design; (3) digital integration through real-time tracking and fare systems; and (4) collaborative governance involving communities and operators. This research is the first systematic evaluation of user satisfaction across multiple transport modes in Palu, contributing a multidimensional framework that links user perceptions with strategic policy recommendations for sustainable mobility in secondary cities.

Keywords: Public Transportation, Urban Mobility, User Satisfaction, Participatory Governance, Transport Accessibility.

INTRODUCTION

Public transportation plays a vital role in sustainable urban development by reducing private vehicle dependency, lowering emissions, and enhancing social mobility(Andrade et al., 2023; Witchayaphong et al., 2020). n Indonesia, congestion and unequal access make reliable transport services urgent. National programs such as TransJakarta and Trans Jogja illustrate how structured

systems can connect economic growth with environmental goals (Malkhamah et al., 2019; Sangadji & Basuki, 2021). However, similar evaluations in secondary cities remain scarce.

In Palu City, Central Sulawesi, the urgency for effective public transport has intensified due to rapid population growth and expanding urban activities. As of 2023, the city housed an estimated 387,493 residents. However, the local transportation system has not kept pace. Conventional transport modes, particularly angkot, have seen a drastic reduction from approximately 400 units in 2017 to about 40 in 2023. This decline not only reflects operational and managerial shortcomings but also highlights a growing user preference for digital, app based transport services.

The widespread dissatisfaction with angkot stems from their unpredictability, lack of comfort, and inadequate route adherence. Many users report irregular schedules, driver route deviations, and vehicle conditions that fall short of urban expectations. These shortcomings contribute to growing dependency on private vehicles and a deepening transport inequality. Surveys indicate user satisfaction with angkot remains low, particularly in wait times and vehicle conditions. Conversely, app based services like Gojek and Maxim achieve satisfaction rates exceeding 90%, driven by their convenience, transparent pricing, and technological responsiveness.

The local government has responded with the Trans Palu BRT initiative, aiming to establish a more structured, modern system. Although initially planned with 12 corridors and 100 buses, only four corridors and 26 buses have materialized due to budget constraints. Despite these limitations, enhancements such as reducing the distance between bus stops to improve accessibility demonstrate adaptive policymaking. Nevertheless, challenges persist, including infrastructure accessibility for disabled and elderly passengers, route inconsistency, and driver behavior.

Studies confirm that effective transport must meet user expectations such as real-time tracking, integrated fares, and inclusive design (Parihar et al., 2021; Steiner & Irnich, 2020). Palu's conventional systems lack these features, pushing commuters toward private or app-based options. Vulnerable groups elderly, disabled, and low-income users are disproportionately affected by inaccessible facilities and inconsistent service delivery (Andrade et al., 2023; Sembiring et al., 2023).

Efforts in other Indonesian cities offer instructive comparisons. Yogyakarta, for instance, integrated ride sharing with traditional systems via Trans Jogja, revitalizing public confidence in shared mobility (Malkhamah et al., 2019). Community engagement in transport planning further boosts service relevance and accountability. By contrast, Palu lacks systemic integration, participatory mechanisms, and adequate digital interfaces.

Hence, this study addresses a clear research gap: the absence of a comprehensive evaluation of user satisfaction across multiple transport modes in Palu. The objectives are: (1) to analyze user satisfaction with angkot, BRT, and app-based services; and (2) to identify governance and infrastructural barriers and opportunities for reform.

This research makes three key contributions: (1) it provides empirical evidence on user satisfaction and preferences across traditional and digital modes; (2) it applies a qualitative framework to

capture lived experiences of diverse groups, including students, workers, and people with disabilities; and (3) it informs regional transport policy with actionable recommendations for inclusive, efficient, and sustainable systems. To our knowledge, this is the first study to systematically map user satisfaction across multiple transport modes in Palu.

METHOD

This study adopts a qualitative descriptive approach to explore user satisfaction and systemic challenges in Palu's public transportation services. This method is suited to contexts where deep, contextual understanding of participant experiences is needed. As Akimov & Bubnova (2022) note, qualitative methodologies excel at capturing complex behavioral patterns within specific social frameworks. However, as Bąk and Borkowski (2019) caution, qualitative research may be limited in generalizability and is time intensive. Despite this, its strength in illuminating urban transport issues at a human level makes it ideal for this study.

A qualitative descriptive strategy was employed to examine the dynamics of public transport experiences in Palu. The focus lies on users' perceptions of angkot, BRT (Trans Palu), and app based transportation, as well as institutional management challenges.

The study was conducted in four subdistricts of Palu City: West Palu, East Palu, South Palu, and Mantikulore. These areas represent the geographic and socio economic diversity of urban Palu. Fieldwork was carried out from January to March 2024.

Purposive sampling was applied to select 42 informants representing diverse perspectives. Inclusion criteria were: (a) age ≥17 years, (b) minimum public transport use 3 times per week. Informants included 20 regular users (students, housewives, workers), 5 persons with disabilities, 7 angkot/BRT drivers, 5 app-based operators, and 5 transport officials. Recruitment was conducted through local community networks, university organizations, and referrals from the city transport office (Krawiec et al., (2019) ; Sembiring et al., (2023)).

Three primary techniques were used:

In depth Interviews: Semi structured guides were used to elicit rich narratives, allowing flexibility in exploring emergent themes.

Non Participant Observation: Observations were conducted at terminals, active angkot routes, and BRT stops to document operational conditions and user behaviors.

Document Analysis: Official reports, local media coverage, and statistical datasets (e.g., BPS) were reviewed to contextualize field findings.

The Miles and Huberman model (1994) was used:

Data Reduction: Filtering field notes and transcripts to retain relevant thematic content.

Data Display: Organizing data into matrices, narratives, and thematic categories.

Conclusion Drawing and Verification: Interpreting patterns and triangulating insights to enhance validity.

2.6 Validity and Reliability

To ensure data validity, triangulation of sources and methods was applied (Staniek & Sierpiński, 2016). Interviews were cross referenced with observation findings and official documents. Member checking was also employed to verify interpretations with informants. As noted by Siangsuebchart et al. (2021), this validation process strengthens qualitative reliability and ensures findings are rooted in real world experiences.

Overall, this methodology integrates user centric data with institutional perspectives, offering a multidimensional view of Palu's urban mobility landscape. The rigorous sampling, triangulated data sources, and layered analysis collectively enhance the credibility of this study's findings.

RESULT AND DISCUSSION

User satisfaction in Palu varies significantly across different modes. **Table 1** summarizes the main perceptions.

Table 1. User Satisfaction by Transport Mode in Palu

Transport Mode	Positive Aspects	Main Problems Reported	Example Quotes
Angkot	Affordable fares	Highly unreliable schedule, poor vehicle condition, unsafe driving, lack of accessibility	*"Kadang supir suka ganti jalur sendiri, jadi saya terlambat kuliah."* (Female student, 20 y/o)
BRT (Trans Palu)	Clean, affordable, structured routes	Limited corridors (only 4/12), no facilities for elderly/disabled, harsh driving, lack of onboard info	*"BRT bersih dan murah, tapi kalau orang tua saya naik, susah karena tidak ada ram."* (Housewife, 42 y/o)
App-based (Gojek, Maxim)	Fast, convenient, transparent pricing, high satisfaction (>90%)	Surge pricing at peak hours, dependence on internet connection	*"Kalau pakai aplikasi jelas, tarif kelihatan. Cuma kadang pas jam sibuk harga naik tinggi."* (Worker, 28 y/o)

Accessibility concerns were especially voiced by disabled respondents. One wheelchair user stated: *"Tidak ada jalur khusus atau kursi untuk difabel, jadi saya sulit naik angkot maupun BRT."*

User Perceptions of Public Transportation Quality in Palu

User satisfaction in Palu's public transportation is shaped by diverse experiences and expectations. Interview data reveal recurring concerns over service reliability, comfort, accessibility, and consistency. Many respondents report that angkot services are highly unpredictable. A university student described frequent delays and route deviations that often result in missed classes. This finding echoes previous literature that identifies schedule reliability and travel time as crucial satisfaction determinants (Andreev & Terentyev, 2017; Siangsuebchart et al., 2021).

BRT services (Trans Palu) received more favorable reviews, particularly among older users and housewives. While valued for cleanliness and affordability, concerns persist regarding harsh driving and lack of onboard announcements, especially for vulnerable groups like the elderly. This aligns with research on the importance of accessible and inclusive transport systems for enhancing usability and equity (Sembiring et al., 2023).

Digital app based transport (e.g., Gojek, Maxim) emerged as the preferred mode among younger and working users. Its popularity is rooted in speed, technological integration, and real time fare transparency. However, fare surges during peak hours were cited as drawbacks. These findings reinforce existing literature noting digital tools as key drivers of modern mobility choices (Herrera-Quintero et al., 2014).

Accessibility concerns were pronounced among users with disabilities. One informant in a wheelchair noted the absence of ramps and designated seating areas in both angkot and BRT. This aligns with studies highlighting the correlation between accessibility and user satisfaction across socio economic lines (Andrade et al., 2023).

Management Challenges in Transport Service Delivery

Operational inefficiencies persist across modes. Angkot drivers often abandon designated routes in pursuit of passengers, citing survival economics. This behavior undermines user confidence and signals the absence of a regulatory enforcement system. Financial constraints and lack of fleet renewal contribute further to angkot's declining reliability (Andreev & Terentyev, 2017).

The BRT system, though structured, struggles with underfunding. Only a fraction of the originally planned corridors and vehicles has been realized. Infrastructure like bus stops remains insufficiently maintained, while training and oversight for drivers are lacking. These realities mirror challenges cited in BRT literature around sustainability and budget dependency (Steiner & Irnich, 2020).

Digital governance and monitoring tools remain underutilized. Unlike other cities where GIS and real time systems inform routing and feedback mechanisms, Palu lacks such infrastructure. Stakeholders acknowledge the need for modernization, yet cite policy fragmentation and funding gaps as primary obstacles (Nur et al., 2023; Surio et al., 2022).

Community and Operator Initiatives Toward Reform

Despite system level challenges, reform oriented initiatives are surfacing. Students and civil society actors advocate for improved route mapping, real time apps, and schedule enforcement. These proposals reflect a shift toward participatory governance in transport planning (Zakharenko et al., 2023).

Operators also express willingness to professionalize their services. A Trans Palu driver emphasized the need for structured training and performance incentives to reduce service complaints. Literature supports such training models as pathways to improved system performance and public perception (Nur et al., 2023).

Youth oriented perspectives underscore the role of mobile applications in boosting ridership. Features like bus location tracking and digital ticketing are seen as essential to attract younger commuters. This aligns with research demonstrating that app integration increases satisfaction and frequency of use among youth (Du, 2021; Гречан & Gavrikov, 2023).

Collectively, these results illustrate a gap between user expectations and current service provision. However, they also highlight actionable pathways through digital tools, inclusive policies, and collaborative stakeholder engagement to advance public transport reform in Palu.

The findings of this study reveal that public transportation in Palu City remains far from meeting user expectations, especially in the dimensions of reliability, accessibility, comfort, and governance. These inadequacies not only reduce public satisfaction but also shift commuter preferences toward app based or private vehicle options, reinforcing transport inequality and undermining sustainability goals.

This outcome highlights a critical misalignment between urban transport services and real user needs. Consistent with prior literature Siangsuebchart et al. (2021), service factors like schedule regularity, vehicle cleanliness, and accessibility particularly for disabled and elderly users emerge as decisive elements influencing satisfaction. The lack of these features in angkot and BRT systems in Palu contributes directly to their decreasing ridership and the corresponding rise of digital ride hailing services.

A major theme in this study is the governance gap in transport planning and operations. Both angkot and BRT systems suffer from a lack of funding, training, and integrated policy direction. Drivers navigate with minimal oversight, and transport authorities lack tools for real time performance monitoring or feedback collection. As documented by Sembiring et al. (2023) and Tamblay et al. (2018), these deficiencies severely constrain service reform efforts. Financial limitations further restrict BRT expansion, mirroring patterns seen across other Indonesian cities (Steiner & Irnich, 2020).

However, this situation also presents an opportunity to reimagine governance models through more inclusive and collaborative frameworks. Collaborative governance defined by stakeholder engagement across government, civil society, and private operators can bridge gaps in public trust and planning coherence. As supported by Andrade et al. (2023) and Sembiring et al. (2023), such

models foster accountability and localized innovation. Evidence from other contexts demonstrates that involving users in system design and feedback loops leads to more resilient and responsive transportation ecosystems.

International best practices illustrate the transformative power of technology in public transport. Cities like Singapore and Barcelona have demonstrated that integrating user friendly apps, real time data analytics, and multimodal smart card systems increases user trust and ridership (Tamblay et al., 2018). In Palu, the success of digital ride hailing platforms underscores a readiness for similar tech adoption in public transport especially among youth. Yet, the public sector has lagged in digital infrastructure development, signaling a missed opportunity for modernization and user engagement.

Inclusivity must also become a cornerstone of transport reform in Palu. Infrastructure design that excludes the disabled or elderly undermines social equity and violates universal service principles. As highlighted by Andreev & Terentyev, (2017) and Parihar et al. (2021), policy frameworks must institutionalize access standards, subsidized services for vulnerable groups, and participatory budgeting models that incorporate citizen input. These inclusive approaches are essential to dismantling the barriers that disproportionately affect underrepresented populations in urban mobility.

Despite the financial constraints, innovation remains possible. Cities facing budget limitations can still foster reform by supporting local entrepreneurship, developing pilot programs for low cost mobility tools, and embracing public private partnerships (Andrade et al., 2023; Tisnawan et al., 2022). Palu's youth led calls for route tracking applications and community generated service data point toward grassroots innovation potential. Localized tech adoption, even on a limited scale, can serve as a catalyst for broader modernization.

Study Limitation should also be noted. As a qualitative study in a single city, findings may not be generalizable to other contexts. The sample size, though diverse, remains limited compared to broader quantitative surveys. Additionally, the study did not evaluate longitudinal impacts, which restricts understanding of how reforms might evolve over time. Future research should adopt mixed-methods approaches, larger samples, and comparative designs across multiple mid-sized Indonesian cities to validate and extend these insights,

In sum, addressing Palu's transport deficiencies requires multi-dimensional reform anchored in user needs, driven by collaborative governance, enabled by smart technologies, and committed to inclusivity. This integrated approach can reposition public transport as a viable, dignified, and sustainable option for all urban residents, while simultaneously reinforcing the city's broader development goals.

CONCLUSION

This study provides the first systematic evaluation of user satisfaction across multiple transport modes in Palu City, highlighting a persistent gap between commuter expectations and service delivery. Findings show that angkot and BRT remain unreliable, inaccessible, and poorly managed,

while app-based services dominate user preference due to convenience and transparency. Governance weaknesses including fragmented policies, insufficient funding, and lack of digital tools further undermine system performance.

The scientific contribution of this research lies in its multidimensional framework linking user perceptions, governance challenges, and policy reform options in a secondary Indonesian city, a perspective rarely explored in previous studies. Practical recommendations include strengthening service reliability, embedding inclusive infrastructure, integrating digital tools, and fostering collaborative governance across stakeholders.

Nevertheless, this study is limited by its qualitative design, single-city focus, and time-bound data collection, which restrict generalizability. Future research should employ mixed methods, longitudinal designs, and cross-city comparisons to assess the broader applicability of proposed reforms and their long-term impacts on sustainable mobility.

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