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Perception, Affordability, and Willingness to Pay for Toll Roads in Emerging Regions: Evidence from the Trans Sumatera Corridor in Indonesia

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Abstract

This study investigates user perception, affordability concerns, and willingness to pay (WTP) for the Trans Sumatera Toll Road in Riau Province, a newly tolled region where road pricing is still unfamiliar to many residents. Using 412 survey responses analyzed through descriptive statistics, cross-tabulations, and regression models, the study reveals a consistent gap between perceived effectiveness and perceived affordability. While 74 percent of users view the toll road as effective in improving travel speed and comfort, only 41 percent consider the tariff fair. Comparative affordability analysis shows that toll rates in Sumatera account for a higher share of income than those in Java and several benchmark countries, reinforcing local concerns about cost burden. WTP results indicate that users are willing to pay higher tariffs for occasional travel but become significantly more price-sensitive for frequent use, as confirmed by the Wilcoxon signed-rank test. Regression findings show that income, trip purpose, and usage frequency influence WTP, whereas information clarity is the strongest and most consistent predictor of both positive perception and greater payment willingness. These findings highlight the importance of communication transparency and locally adaptive pricing strategies for promoting public acceptance and ensuring equitable toll road use in emerging regions.

Keywords: Willingness to Pay (WTP), User Perception, Toll Road Pricing, Transport Policy in Emerging Regions, Infrastructure Affordability.

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I. Introduction

Improving connectivity across Sumatera has become a key priority in Indonesia's national development agenda. As part of this effort, the Trans Sumatera Toll Road (JTTS) was launched to enhance interregional transport and support economic growth outside Java. Consisting of 24 segments that extend from Banda Aceh to Bakauheni, the network is designed to serve as the main corridor for goods and passenger movement throughout the island (Kurniawan et al., 2022). Toll road expansion has become a cornerstone of infrastructure investment under the Jokowi administration, which views transportation networks as both an engine of growth and a symbol of national progress (Negara, 2018). Between 2014 and 2019, Indonesia added more than 1,200 kilometers of toll roads, exceeding the total built in the previous seven decades (Siswoyo, 2020).

Riau Province occupies a strategic position within this network. Located along the Malacca Strait, it is one of Sumatera's main economic centers and a major logistics hub (Riau Province, 2019). The government has identified Riau as a priority area for industrial and transport development, supported by the construction of several new toll segments such as Pekanbaru–Dumai, Pekanbaru–Bangkinang, and the under-construction Pekanbaru–Rengat section. These projects aim to improve connectivity, reduce travel time, and strengthen Riau's role as a regional trade gateway. Recent studies have also discussed the financial and institutional challenges of ensuring toll road sustainability in Indonesia, emphasizing the need for alternative mechanisms such as land value capture (Anwar et al., 2025). However, the long-term success of these projects depends not only on financial viability but also on whether local users accept and regularly use these new toll facilities.

User acceptance is a central factor in determining the success of road pricing policies. It reflects the extent to which users perceive toll systems as fair, reasonable, and beneficial, and influences both compliance and long-term use (Bari et al., 2023; Gomez et al., 2017). Acceptance is closely linked to two behavioral dimensions: users' perception and willingness to pay (WTP). Users' perception refers to how individuals evaluate the toll road's effectiveness, fairness, and personal benefits, while WTP reflects the value they assign to those benefits in monetary terms. In Indonesia, the introduction of toll systems may raise issues of fairness and affordability as it previously relied on public roads. International experience shows that users' acceptance of road pricing depends on how they perceive the benefits, costs, and transparency of the system (Holguín-Veras et al., 2020; Glavic et al., 2017). Conversely, when users feel that toll rates are disproportionate to income or that benefits are unclear, public resistance can limit toll road utilization even when infrastructure quality is high.

Riau presents a particularly interesting case. The province has long faced some of the poorest road conditions in Indonesia, partly due to the widespread presence of overloaded trucks that accelerate road damage (Serambi Riau, 2022). For individual users, the new toll road offers a safer and smoother alternative to regular routes. However, it also introduces a new financial cost that may be unfamiliar to many residents. Understanding how these users perceive the toll road and how much they are willing to pay is essential for evaluating public acceptance of road pricing in newly tolled regions.

Previous studies have examined user willingness to pay in several parts of Sumatera, including Aceh (Wathan et al., 2020), North Sumatera (Panjaitan & Surbakti, 2013), Lampung (Engel, 2014), and Riau (Parsaulian, 2023). Most of these studies, however, focus

on single road sections or emphasize technical valuation rather than behavioral perception. Few have explored how users in newly integrated provinces interpret the balance between service quality, affordability, and payment. In other words, there is limited evidence on how first-time toll users respond to the concept of road pricing.

This study fills that gap by analyzing the perceptions and willingness to pay of individual users of the Trans Sumatera Toll Road in Riau Province. It focuses on how people assess the toll road's effectiveness, affordability, and overall value, while also exploring the factors that influence these perceptions. For many residents, the toll road represents a new choice between continuing to use congested public roads and paying for a safer, faster alternative. Understanding these perceptions is therefore vital for designing pricing and communication strategies that ensure both economic sustainability and social acceptance. The study contributes to policy discussions on infrastructure governance by highlighting how local conditions and user experience shape the success of toll road initiatives in emerging regions of Indonesia.

II. Methods

2.1. Study Area

Riau Province is located on the eastern coast of Sumatera, Indonesia, and occupies a strategic position along the Malacca Strait, one of the world's busiest maritime corridors. The province covers an area of 89,936 square kilometers and is home to approximately 6.64 million people (BPS Riau, 2024). Its geographic location along the Trans-East Sumatera corridor grants it strategic importance in connecting key economic centers across Sumatera and facilitating cross-border logistics through access to the Malacca Strait.

As regulated in *Government Regulation (PP) No. 26 of 2008* on the National Spatial Plan, Riau is designated as one of Indonesia's main growth centers, with formal plans for industrial, transportation, and logistics infrastructure development to support economic growth throughout Sumatera. The province contributed approximately 23 percent of Sumatera's total Gross Regional Domestic Product (GRDP) in 2023, ranking second only to North Sumatera (BPS Riau, 2024). Its economy is dominated by the oil and gas, plantation, and manufacturing sectors, making Riau one of the most important economic regions outside Java.

As part of the Trans Sumatera Toll Road (JTTS) network, six toll road segments are planned to traverse Riau Province. These projects are expected to strengthen regional connectivity and facilitate inter-provincial trade and mobility. Two segments are already operational, including the Pekanbaru–Dumai and Pekanbaru–Bangkinang sections, while four others are currently in various stages of planning and construction. According to the *Ministry of Public Works and Housing Decree (Kepmen PUPR) No. 367 of 2023*, the remaining sections are scheduled for completion between 2025 and 2039 to ensure full integration of Riau's corridor within the national toll road network.

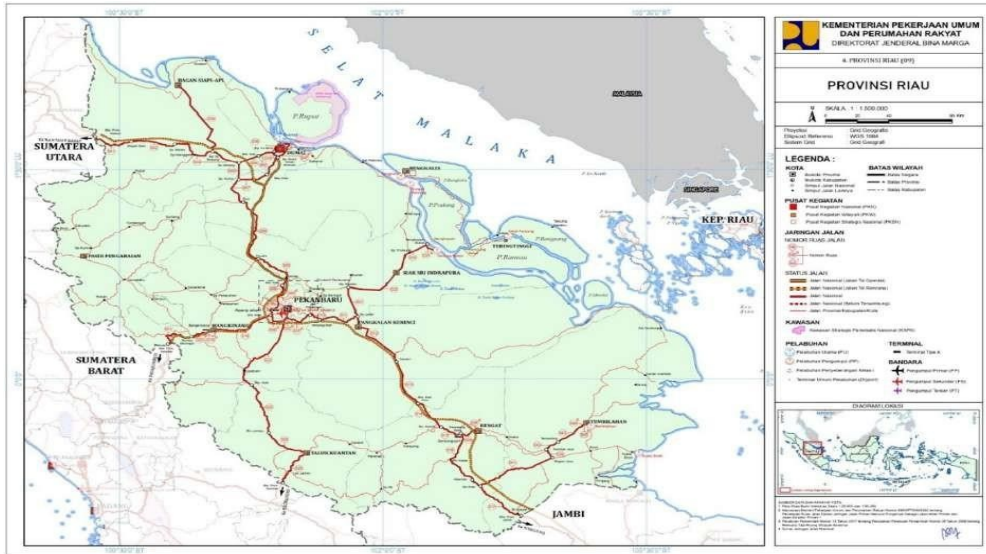


Figure 1. Map of The Riau Province Road Network
Source: Ministry of Public Works and Housing, 2023

Despite these improvements, Riau continues to face serious challenges related to the condition of its public roads. According to *Indonesian Land Transport Statistics (BPS, 2021)*, the province recorded the longest total length of damaged and severely damaged roads in Indonesia, exceeding 1,000 kilometers. Much of this deterioration is caused by over-dimension and over-loading (ODOL) trucks that exceed legal weight limits, accelerating road damage and increasing maintenance costs (PUPRPKPP Riau, 2023). The development of toll road infrastructure therefore provides an essential alternative for smoother, safer, and more reliable travel, particularly for private users. This context makes Riau a relevant and timely setting for examining how people perceive, evaluate, and adapt to the introduction of toll roads in a newly priced road system.

2.2. Research Design and Data Collection

This study applies a quantitative approach to analyze users' perception and willingness to pay for the Trans Sumatera Toll Road in Riau Province. The approach allows systematic measurement of relationships between user characteristics, perception, and payment preferences to understand how individuals evaluate the toll road in a newly tolled region.

Primary data were collected through an online questionnaire distributed to residents of Riau Province between March and April 2025 resulting in 412 valid responses. The survey link was shared through social media and email using a snowball sampling method. Participation was voluntary and anonymous, and all respondents provided informed consent.

Perception was measured using a five-point Likert scale to evaluate toll road effectiveness, affordability, and satisfaction. Willingness to pay was measured using a stated preference approach based on the contingent valuation method. Respondents were presented with two hypothetical travel scenarios which are occasional use and frequent use. They get asked to select the maximum toll rate they were willing to pay from predefined tariff options.

This stated preference design follows behavioral modeling practices in transportation studies (Alvinsyah and Mulyono, 2024; Gomez et al., 2017). Using hypothetical travel scenarios enables estimation of price sensitivity and variation in preferences across user groups.

2.3. Variable and Analytical Framework

Examining user behavior toward toll road use in Riau Province, independent variables in this study are divided into three categories. The first category is situational factors, which include the type of alternative route, trip purpose, frequency of use, and road quality. These variables describe the travel context that influences how users experience and evaluate the toll road. The second category is individual factors, consisting of gender, occupation, education, and income. These variables represent social and economic characteristics that shape how users perceive the value and affordability of toll road use. The third category is information related factors, including information availability and perception framing. These variables capture how the clarity and accessibility of information affect user understanding, trust, and acceptance.

The dependent variables are users' perception of toll roads and their willingness to pay. User perception is analyzed through two dimensions, effectiveness and affordability, which reflect how users evaluate both the performance and fairness of the toll road. Willingness to pay refers to the maximum amount respondents are willing to spend for access under two usage conditions, occasional use and frequent use.

Willingness to pay was analyzed using the contingent valuation method, which is suitable for estimating monetary preferences for public services under hypothetical conditions. Descriptive statistics and cross tabulation were used to identify general patterns, while regression analysis tested the effects of independent variables on perception and willingness to pay. Binary logistic regression was applied to estimate the likelihood that users viewed the toll road as effective or affordable, while ordinary least squares regression analyzed continuous willingness to pay values. Statistical significance was evaluated at the five percent level ($p < 0.05$), and all analyses were performed using SPSS 27.

III. Results, Analysis, and Discussions

3.1. Respondent Profile

From 412 respondents in the survey, the largest group of participants were government employees, followed by entrepreneurs and private sector workers, reflecting Riau's mix of administrative and commercial activity. Most respondents had completed higher education, with the majority holding a diploma or bachelor's degree, while a smaller proportion had postgraduate qualifications. Income levels were mostly within the middle-income range of IDR 2 million to 6 million per month, and a smaller share reported earnings above IDR 8 million. Geographically, most respondents resided near Pekanbaru and along the main toll corridors, which are the areas most directly served by operational toll road segments.

Situational factors provide further insight into how users interact with the toll road. Most respondents (62 percent) stated that their alternative routes are usable but require repairs, while 19 percent said the roads on their routes need major improvements, and only

8 percent were satisfied with regular roads. This confirms that poor road conditions remain a major concern in Riau. However, toll road usage frequency is relatively low. About two-thirds of respondents use the toll road only one to four times per month, 17 percent are frequent users, and 16 percent reported never using it. For most users, the toll road is primarily used for non-routine trips such as vacations or business travel, rather than daily commuting.

The findings also highlight the role of incentives and information. Around 78 percent of respondents indicated that discounts or special offers would strongly influence their decision to use the toll road more often, and 93 percent found the existing toll information clear or fairly clear. Most respondents (82 percent) also stated that clear communication about tolling policies strongly affects their perception and acceptance. These results suggest that both financial incentives and transparent information play important roles in shaping toll road usage behavior.

3.2. Users' Perceptions

Survey results show that users hold generally positive perceptions of the Trans Sumatera Toll Road, particularly regarding its performance and reliability. As shown in Figure 2., 74 percent of respondents rated the toll road as effective in improving travel, while 26 percent viewed its impact as moderate or low. In contrast, affordability remains a concern: 59 percent considered the tariff expensive, and only 41 percent described it as fair. This contrast between satisfaction with performance and concern over affordability is central to understanding public acceptance.

When asked about the toll road's main benefit, most respondents identified travel time savings as the primary advantage, followed by easier access to destinations and greater driving comfort. Only a small proportion mentioned broader economic effects, suggesting that users tend to value immediate personal benefits over long-term regional impacts. These findings indicate that time efficiency is the dominant motivator for toll road use, particularly in regions where regular roads are often damaged and congested.

Cross-tabulation results (Table 1) show that perceptions vary across user characteristics. Male respondents and higher-income users were more likely to perceive the toll road as effective, but they were also more critical of affordability than female respondents. Respondents from Pekanbaru tended to view the toll rate as more reasonable, while those in Dumai or Bangkinang more often considered it expensive. Frequent users gave higher ratings for effectiveness but were less satisfied with price fairness, reflecting increased sensitivity to cumulative costs. Information clarity also appears important: respondents who found toll information clear were more likely to perceive the road as both effective and fairly priced.

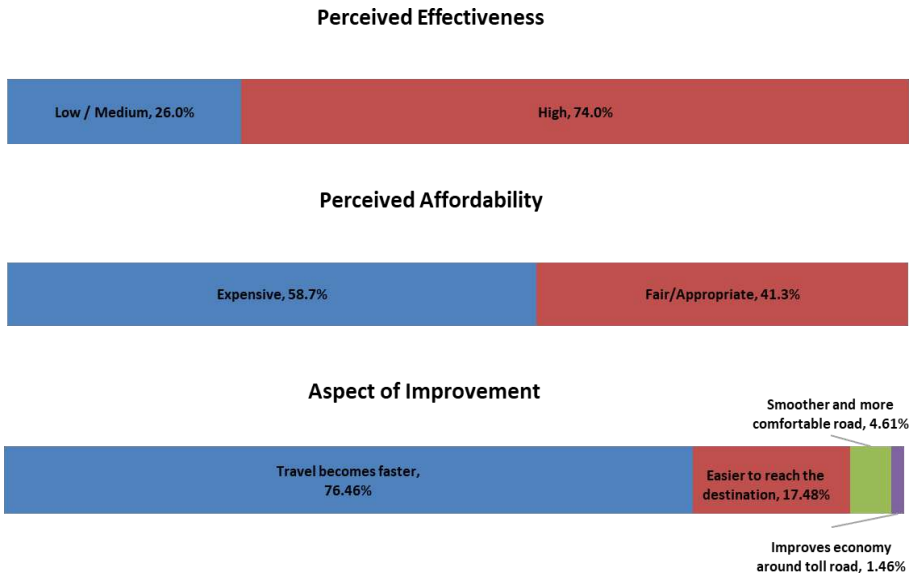


Figure 2. Distribution of Users’ Perceptions
 Source: Author Analysis, 2025

Table 1. Cross Tabulation of Perceived Effectiveness and Affordability by Key Factors

Variable	Category	Perceived Effectiveness (%)		Perceived Affordability (%)	
		Low/ Medium	High	Expensive	Fair / Appropriate
Gender	Male	23.6	76.4	63.1	36.9
	Female	28.2	71.8	54.5	45.5
Income (IDR / month)	< 2 million	30.8	69.2	48.7	51.3
	> 8 million	15.6	84.4	63.5	36.5
Frequency of use (per month)	Rarely (1 to 4 times)	27.8	72.2	59.2	40.8
	Often (5 times or more)	15.9	84.1	62.3	37.7
Information clarity	Unclear	42.9	57.1	81.0	19.0
	Clear	17.9	82.1	49.1	50.9
Residence	Pekanbaru	26.7	73.3	52.9	47.1
	Dumai	19.0	81.0	69.6	30.4
	Bangkinang	30.1	69.9	64.5	35.5

Source: Author Analysis, 2025

Overall, users appreciate the toll road’s contribution to faster, more comfortable travel but remain cautious about its affordability. Effectiveness alone does not ensure user acceptance; perceived fairness and transparency are equally important for sustaining regular usage.

A broader comparative assessment provides additional context for affordability perceptions. When the toll rate is expressed as a share of income, the Trans Sumatera Toll Road appears relatively more expensive than toll roads in Java and other countries. As shown in Table 2, the toll/km cost in Sumatera accounts for about 0.0017 percent of GDP per capita that is higher than Java (0.0015) and comparable to the Philippines (0.0016). In contrast, Malaysia and Turkey record lower ratios, indicating greater affordability, while Mozambique shows the highest burden (0.0033).

Table 2. Toll Road Tariff Affordability in Indonesia and Selected Countries

Region / Country	Toll Road Example	Toll Rate (USD/km)	GDP per Capita (USD)	Toll/km as % of GDP per Capita	Source
Indonesia					
Java	Semarang–Demak	0.075	4,876	0.0015	Balai Pengatur Jalan Tol, Kementerian PUPR (https://bpjt.pu.go.id)
Borneo	Balikpapan–Samarinda	0.097	4,876	0.0020	Balai Pengatur Jalan Tol, Kementerian PUPR (https://bpjt.pu.go.id)
Sumatera	Trans Sumatera Toll Road	0.082	4,876	0.0017	Balai Pengatur Jalan Tol, Kementerian PUPR (https://bpjt.pu.go.id)
Other Countries					
Malaysia	East Coast Expressway Phase 2	0.047	11,379	0.0004	Malaysian Highway Authority (https://www.llm.gov.my)
Philippines	Tarlac–Pangasinan–La Union Expressway	0.061	3,805	0.0016	Department of Public Works and Highways (https://www.dpwh.gov.ph)
India	Eastern Peripheral Expressway	0.018	2,481	0.0007	National Highways Authority of India (https://nhai.gov.in)
Turkey	Aydın–Denizli (O-31)	0.083	13,106	0.0006	Republic of Turkey General Directorate of Highways (https://www.kgm.gov.tr)

Region / Country	Toll Road Example	Toll Rate (USD/km)	GDP per Capita (USD)	Toll/km as % of GDP per Capita	Source
Albania	Milot–Fier Highway	0.042	8,575	0.0005	Albanian Roads Authority (https://www.arrsh.gov.al)
Mozambique	Maputo–Katembe Toll Road	0.021	623	0.0033	Mozambique Road Network, Rede Viária de Moçambique (https://www.revimmo.co.mz)

Source: Various official publications and World Bank data (retrieved 2025). Calculations by author

This comparison supports respondents' concerns regarding affordability, showing that toll rates in Sumatera impose a relatively higher cost burden relative to income. These observations correspond with previous studies emphasizing that user perceptions of fairness are closely linked to actual purchasing power and local economic conditions. Similar patterns have been observed in other toll projects, where positive service perceptions coexist with skepticism toward pricing (Gomez et al., 2017; Kurniawan et al., 2022). Ensuring that toll pricing aligns with regional affordability levels is therefore an essential consideration for maintaining user confidence and long-term utilization of the Trans Sumatera Toll Road.

3.3. Willingness to Pay and Its Relationship with User Perception

The analysis of willingness to pay (WTP) provides further insight into how users evaluate the costs and benefits of using the Trans Sumatera Toll Road. Two stated preference scenarios were presented to respondents. The first represented occasional use, referring to non-routine trips such as long-distance or leisure travel, while the second represented frequent use, or regular travel on the same toll segment.

Under the occasional-use scenario, most respondents indicated a relatively high WTP level. The largest share of respondents selected a tariff of IDR 50,000 per trip, followed by IDR 30,000 and IDR 20,000. Only a small proportion (around 7 percent) chose tariffs below IDR 10,000, and very few indicated that they would not pay any toll fee. This suggests that for occasional travel, most users are willing to pay a moderate to high tariff in exchange for improved travel comfort and reduced travel time.

In contrast, under the frequent-use scenario, the distribution of WTP shifted toward lower tariff categories. A greater number of respondents preferred moderate tariffs (IDR 10,000–20,000), and fewer selected higher options above IDR 30,000. The proportion of respondents who selected zero WTP increased compared with the occasional scenario, indicating higher sensitivity to cost when toll payments become a recurring expense.

Overall, 63 percent of respondents were willing to pay at least IDR 30,000 per trip under the occasional-use scenario, while only about one-third were willing to pay the same amount for frequent use. This contrast highlights that user willingness to pay depends strongly on trip frequency and the cumulative financial burden of toll costs.

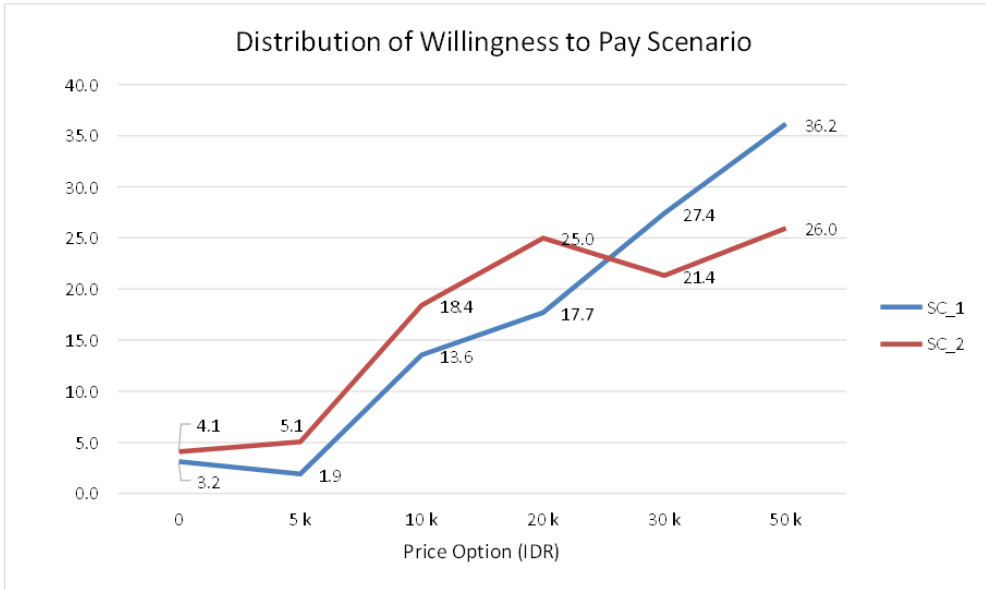


Figure 3. Distribution of Willingness to Pay under Occasional (SC_1) and Frequent Use Scenarios (SC_2)
Source: Author Analysis, 2025

To test whether the differences between the two scenarios were statistically significant, a Wilcoxon signed-rank test was performed. The results show a significant difference ($p < 0.05$) with a large negative effect size ($r = 0.62$), confirming that respondents tend to lower their WTP under frequent-use conditions. The summary of ranks is shown in Table 3.

Table 3. Summary of Willingness to Pay (WTP) Across Scenarios

Rank Category	Interpretation	Count (n)	Mean Rank	Sum of Ranks
Negative Ranks	WTP in Scenario 2 < Scenario 1 (Preference for Scenario 1)	132	80.3	10,599.5
Positive Ranks	WTP in Scenario 2 > Scenario 1 (Preference for Scenario 2)	25	72.1	1,803.5
Ties	No difference between scenarios	255	—	—
Total		412		

Source: Author Analysis, 2025

The overall pattern indicates that while respondents recognize the benefits of toll road use, their willingness to pay is influenced by how often they travel and by their personal financial conditions. Occasional users tend to value the toll road as a premium service that offers time savings and greater comfort, while frequent users are more cautious about cumulative costs.

These results suggest that willingness to pay depends on both the frequency of toll use and perceived affordability. Occasional users are more willing to pay higher tariffs because toll use is viewed as a one-time expense for greater comfort and time savings. In contrast, frequent users are more sensitive to price because repeated payments increase the financial burden. This finding aligns with studies by Gomez et al. (2017) and Yusuf et al. (2014), which found that user willingness to pay declines when infrastructure costs become part of regular travel expenditure.

The difference between perceived effectiveness and affordability also explains variations in WTP. As highlighted by Holguín-Veras et al. (2020) and Bari et al. (2023), user satisfaction with infrastructure quality does not always translate into higher payment acceptance when cost fairness is questioned. The results from Riau suggest that users recognize the benefits of the toll road but expect tariffs that align with regional income conditions.

From a policy standpoint, this relationship suggests that measures such as commuter discounts, loyalty programs, or off-peak tariffs could help reduce price sensitivity among regular users while maintaining toll revenue stability. Ensuring transparent communication regarding tariff setting and benefits may also strengthen user confidence and willingness to pay over time.

3.4. Factors Influencing Users' Perception and Willingness to Pay

Regression analysis was conducted to identify factors influencing user perception and willingness to pay (WTP). The dependent variables included perceived effectiveness, perceived affordability, and WTP under both occasional and frequent use scenarios, while the independent variables comprised income, residence, trip purpose, frequency of use, and information clarity.

The results show that income significantly affects both perceived effectiveness and willingness to pay. Users with higher income levels are more likely to regard the toll road as effective and to express greater willingness to pay. This finding aligns with previous studies by Gomez et al. (2017) and Yusuf et al. (2014), which found that financial capacity contributes to more positive perceptions of toll roads. However, income does not significantly influence perceived affordability, suggesting that fairness evaluations depend more on perceived value than on income alone.

Situational factors, particularly residence and trip purpose, also play an important role in shaping perceptions of affordability. Respondents living in or near Pekanbaru are more likely to consider the tariff reasonable, possibly due to shorter travel distances and easier access to toll facilities. In contrast, users from Dumai and Bangkinang tend to perceive the tariff as less affordable. This pattern appears related to income disparities across corridors. Based on the Governor's Decree of Riau Province No. Kpts. 3777/XII/2024 on the 2025 Regency and Municipality Minimum Wage, Dumai City has the highest minimum wage in the province, followed by Bengkalis and Pekanbaru. Although Dumai records the highest wage level, users from this area still perceive the toll as less affordable, which may reflect higher travel distances, higher daily transport costs, and differing household expenditure patterns. This indicates that affordability perception is influenced not only by income levels but also by spatial and behavioral factors such as trip distance and corridor accessibility.

Trip purpose further influences perception. Business and commuting travelers tend to rate the toll as more affordable than those traveling for leisure, as toll use is directly linked

to productivity and time efficiency. These results are consistent with Bari et al. (2023), who found that affordability perception is closely tied to trip purpose and the practical value users derive from toll road use.

Frequency of use also has a significant effect on willingness to pay, though its influence varies between scenarios. In the occasional use scenario, frequent users report higher willingness to pay, likely due to greater familiarity with the toll road’s benefits in travel time and comfort. In the frequent use scenario, the same pattern holds, but with a stronger price sensitivity effect, particularly among users who face repeated payments. This indicates that routine reliance on the toll road can sustain willingness to pay, though affordability concerns remain for high-frequency users. Similar results were observed by Hermani et al. (2023), who found that travel frequency exerts a stronger influence on WTP than demographic variables such as income or education.

Table 4. Key Factors Influencing Users’ Perception and Willingness to Pay for the Trans Sumatera Toll

Key Variable	Perceived Effectiveness	Perceived Affordability	Willingness to Pay (Scenario 1: Occasional Use)	Willingness to Pay (Scenario 2: Frequent Use)
Income	Positive (significant)	Not significant	Positive (significant)	Positive (significant)
Place of Residence	Not significant	Significant (users in Dumai and Bangkinang less likely to find tariff affordable than those in Pekanbaru)	Not significant	Not significant
Trip Purpose	Not significant	Significant (recreation users less likely to find tariff fair than commuters)	Not significant	Significant (business trips associated with higher WTP)
Frequency of Use	Not significant	Not significant	Positive (significant; frequent users have higher WTP per trip)	Positive (significant; frequent users more price sensitive)
Information Clarity	Positive (significant)	Positive (significant)	Positive (significant)	Positive (significant)
Discount Sensitivity	Negative (significant; discount-influenced users less likely to view toll as effective)	Not significant	Not significant	Not significant

Note: “Significant” refers to $p < 0.05$. Scenario 1 measures willingness to pay for occasional use, while Scenario 2 captures willingness to pay for frequent use. Source: Author’s regression analysis, 2025.

Information clarity emerges as the most consistent and influential factor across all models. Respondents who find toll information clear are more likely to perceive the toll road as effective, fair, and worth paying for. This supports the findings of Gomez et al. (2017) and

Holguin Veras et al. (2020), who emphasized that transparency and effective communication are central to public acceptance of road pricing. Clear and accessible information regarding tariff calculation, revenue allocation, and service benefits strengthens user trust and improves policy legitimacy, as also highlighted by Nurrul Helen (2021) in a different context.

Overall, the results indicate that users' perceptions and willingness to pay are shaped primarily by income, spatial context, trip purpose, and information clarity rather than by basic demographic characteristics. The consistent influence of information clarity highlights the importance of transparent communication in promoting behavioral acceptance. Ensuring that toll pricing is fair and clearly communicated will be essential for maintaining user confidence and supporting sustainable toll road policy in Riau and other parts of Sumatera.

IV. Conclusion and Recommendation

Most respondents perceive the Trans Sumatera Toll Road as effective in improving travel speed and convenience. However, concerns about affordability remain, with less than half of users considering the current tariff to be fair. This suggests that while many respondents acknowledge the benefits of the toll road, a significant share continues to view the cost as burdensome. Comparative evidence also indicates that the relative cost of using toll roads in Sumatera is higher than in several other regions and countries, which may contribute to these perceptions of limited affordability.

The analysis shows that willingness to pay varies across user groups. Occasional travelers, who place higher value on time savings and comfort, are generally more willing to pay higher toll rates. In contrast, frequent users are more sensitive to toll prices because of the cumulative cost of regular travel. These differences indicate that policies designed to improve affordability, such as targeted discounts or flexible pricing schemes, could be more effective in encouraging consistent use of toll roads.

Perception and willingness to pay are related but not always aligned. While many users recognize the benefits of the toll road, they remain cautious about paying higher rates, especially for frequent use. Acceptability, which is often associated with perceptions of fairness and public investment, does not always translate into a higher willingness to pay. Instead, actual payment behavior appears to be influenced by income level, travel habits, and budget considerations.

Regression analysis further highlights that clarity of information is the only factor consistently linked to both positive perceptions and higher willingness to pay. Income is associated with perceived effectiveness, while perceived affordability is more strongly influenced by residence and trip purpose. Frequency of toll road use also plays an important role, suggesting that situational and informational factors have greater influence than basic demographic characteristics.

From a policy perspective, the findings suggest that communication and pricing strategies need to be adjusted to reflect local perceptions of value and affordability. Strengthening transparency, ensuring that information is clearly conveyed, and taking into account the needs of frequent and cost-conscious users may help enhance public acceptance and utilization. In addition, promoting the broader benefits of toll road infrastructure, including safety, comfort, and travel reliability, could help foster more positive user attitudes over time. Overall, the results of this study highlight the importance of a user focused

approach in toll road planning and management. While continued infrastructure investment is vital, achieving long term acceptance and consistent use is likely to rely on a balanced combination of clear communication, adaptive pricing, and responsiveness to local travel patterns.

This study was limited to individual users and employed quantitative methods to identify general patterns. The use of an online survey may have affected sample diversity, as responses were more likely to come from urban and digitally connected participants. Future research could include freight and commercial users or apply qualitative methods to explore broader perspectives. Despite these limitations, the findings provide an initial foundation for understanding how people in outer island regions interpret new toll systems and offer insights for policies that aim to balance financial sustainability with public trust.

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