



Analysis of Demand and Supply of School Bus Services in Singaraja City (Case Study: SMPN 1, SMPN 2, SMPN 3, and SMPN 6 Singaraja)

Made Agus Ridwan Utama

Faculty of Engineering, Udayana University, Denpasar

Corresponding Author: Made Agus Ridwan Utama,

utama.2281511017@student.unud.ac.id

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ABSTRACT

This study analyzes the demand, supply, user characteristics, fleet requirements, and operating costs of school bus services in Singaraja City, where traffic congestion and accident risks are increasing due to high motorcycle use. Using surveys, interviews, and secondary data, the findings show that 80.93% of students are willing to use school buses, with a potential of 832 users requiring at least 26 buses. SWOT analysis highlights government support and student interest as strengths, while limited fleets and routes are weaknesses. The annual operating cost per bus is Rp103,059,125. The study concludes that school bus services have strong development potential if supported by route and fleet expansion as well as sustainable financing.

INTRODUCTION

Transportation is a means of moving people or goods from one place to another. The process can be carried out using transportation facilities, such as vehicles, or without them (Warpani, 1990). Meanwhile, public transportation is any vehicle provided by either the government or the private sector that is used to transport people or goods for a fee (Munawar, 2005). According to Traffic Transportation Law No. 14 of 1994, public transportation refers to any motorized vehicle used to transport passengers or goods and made available to the general public for a fee. According to Tamin (2000), travel is divided into two classifications based on its purpose: primary travel and optional travel. Residential travel for work and educational purposes is categorized as primary travel, as such travel is a necessity for everyone to undertake on a daily basis (Tamin, 2000).

Singaraja City is the second-largest city in Bali Province, after Denpasar City. Singaraja City is one of the areas in Bali Province known as the City of Education. This is not without reason; Singaraja was the first to receive the touch of modernization, including in the field of education, and has developed rapidly to date. According to data from the Central Statistics Agency (BPS) of Bali Province (2023), the population density in Bali is 790 people per square kilometer, covering an area of 5,636.66 square kilometers. The population of Bali Province in 2023 was 4,344,554 people, and the population of Buleleng Regency had the highest population of 826,740 people with a growth rate of 2.38% per year.

This population is spread across 9 (nine) sub-districts, with Buleleng Sub-district being the most densely populated area with a population of 155,173 people. The continuously increasing population growth causes the need for movement from one place to another and the ease in the vehicle purchasing process is a factor causing the increase in ownership and dependence on the use of private vehicles is very high. The number of motorized vehicles in Buleleng Regency is 524,799 vehicles, of which 90.8% are motorcycles. Meanwhile, the growth of road sections is not comparable to the increase in the number of vehicles and the role of public transportation as a critical component of transportation is getting worse over time. The impact is the emergence of traffic congestion, which not only occurs in the city center, but also occurs on connecting roads between regions. Law 22 of 2009 concerning Traffic and Road Transportation in Article 139 mandates that the Central Government, Provincial Governments, Regencies/Cities are obliged to guarantee the availability of public transportation for people and goods. In almost all cities in Indonesia, the use of public transit has decreased or even nearly disappeared along with the growth of private vehicle ownership, especially motorcycles. This situation needs improvement because some urban residents still rely on public transportation for travel, whether for work, school, or other social activities. Among those who most need public transportation are students and schoolchildren.

According to data from the Ministry of Education and Culture (2023), Buleleng Regency has 465 elementary schools with a student population of 67,039. For junior high schools there are 72 schools with a student population of 33,674. For senior high schools there are 29 schools with a student population of

14,516. For vocational high schools there are 27 schools with a student population of 15,307. The number of students in Buleleng Regency is relatively high. However, most students use private motorized vehicles to school, either being dropped off or driving themselves. There are also underage students who drive their vehicles, especially motorcycles. This poses a significant danger, with a high risk of accidents involving students. In 2023, Buleleng Regency reported 656 accidents, resulting in 97 deaths, 1,007 minor injuries, and no serious injuries (Buleleng Police, 2023). The increase in traffic accidents involving students indicates an urgent need for safe and affordable transportation services.

By implementing school transportation services, students can reduce transportation costs to school, reduce the burden on parents to drive, reduce student wandering after school hours, and reduce the risk of traffic accidents that befall students. From the government's perspective, the government has carried out its obligations as mandated by Law No. 22 of 2009, which requires the government to ensure the availability of public transportation. The provision of school transportation services also demonstrates government support, particularly from the Department of Transportation, in the context of creating a Child-Friendly City. Where in this concept of a decent city, the government is obliged to provide safe, affordable, and comfortable transportation.

Previous studies that have been conducted regarding school bus transportation. Among them, research by Sekartadji (2015), in Surabaya, showed that to meet the needs of junior high and high school students around Jalan Wijaya Kusuma, 39 school buses are needed spread across 8 routes with estimated operational costs ranging from Rp5,000 to Rp13,000 per student per trip. However, this study did not include strategic analysis such as SWOT or consideration of the social and economic characteristics of users, and did not present operational costs in a comprehensive annual form. Research by Prihatno (2023), conducted in Tegal City, focused more on estimating the number of buses needed based on the distribution of student residences and limited access to public transportation modes. This study concluded that around 30 buses are needed to serve students effectively. However, this study did not detail operational aspects such as routes or service routes, did not calculate vehicle operating costs (VOC), and did not directly assess the effectiveness or student interest in the service. Another study by Maulita (2015), took the object of regular public transportation (lyn O) in Surabaya and evaluated its performance based on load factors and passenger satisfaction. The study results show that the load factor remains low (0.31–0.35), while the lowest-rated service aspects are cleanliness and route information. However, this study does not address specific demand and supply aspects of school transportation, nor does it address cost analysis or service improvement strategies. Arif (2022) studied mass transit services to Gelora Bung Tomo Stadium using a logistic regression approach to project demand and fleet requirements under various headway scenarios. While the methodology is robust, this study focused on event-based transportation and did not segment student users or routine transportation services such as school buses. Operational aspects such as costs, fixed routes, and service effectiveness were also not examined in depth. Sari (2021) also used a GIS approach to develop

school bus routes in Malang City. The results showed that adding two routes could increase service coverage from 72% to 81%. While this study contributes to spatial aspects, it does not address operational costs, service effectiveness, or SWOT analysis-based development strategies.

Building on the five previous studies, this study presents a more comprehensive approach. This study not only analyzes the demand and supply of school bus services in Singaraja City through a survey of students from four public junior high schools, but also takes into account demographic characteristics, the type of transportation mode used, and readiness to switch to school buses. This study also designs two service routes and estimates the need for school buses. In addition, a detailed calculation of Vehicle Operating Costs (VOC) is conducted and this study also uses a SWOT analysis to evaluate service effectiveness and develop a school bus service development strategy that is adaptive to local needs, making this a significant scientific contribution to the development of student transportation policies in a medium-sized city like Singaraja.

Therefore, a study is needed to determine the supply and demand for student transportation services in Singaraja City, the operational system, and the operating costs of school buses to guide the development of school buses into effective route services. Although junior high school students are not yet legally old enough to drive independently, many of them already have access to vehicles for daily mobility. This phenomenon is of concern because it may be related to factors such as vehicle availability, parental parenting patterns, and the increasing need for transportation among junior high school students.

THEORETICAL REVIEW

Demand Theory

The demand for school bus services reflects the willingness and ability of parents or students to use the service at various price levels. According to demand theory, the quantity of a service demanded increases when the price decreases, assuming other factors remain constant (*ceteris paribus*). In the context of school transportation, several factors influence demand, including:

- The price of school bus services
- Parents' income levels
- The distance between home and school
- Availability of alternative transportation modes
- Perceptions of safety and comfort

Supply Theory

Supply refers to the quantity of school bus services provided by service operators at a given price level. The supply of such services is influenced by:

- Operational costs (fuel, driver wages, maintenance)
- Vehicle capacity and service frequency
- Local government policies regarding subsidies or route permits
- Availability of road infrastructure

School Transportation Model

School transportation is a component of the public transport system that plays a vital role in supporting equitable access to education. According to Litman (2013), transportation that is safe, affordable, and punctual can improve school attendance, reduce tardiness, and ease traffic congestion during peak hours. Student transport is also considered a *derived demand*, meaning its demand arises as a result of the need to engage in another activity (attending school).

Social and Geographical Factors

The characteristics of Singaraja as an educational city in Buleleng Regency affect the dynamics of student transportation. Variations in population density, the geographic distribution of students' residences, and topographical conditions influence the pattern of demand and the efficiency of school transportation service supply.

Market Equilibrium Analysis

Equilibrium between the demand and supply of school bus services occurs when the number of students needing transport matches the number of available seats. An imbalance may lead to either a shortage or surplus, which in turn affects pricing, service quality, and user satisfaction.

Rational Choice Theory

Parents or students make decisions about using school bus services based on rational considerations such as cost, comfort, safety, and time efficiency. These decisions are also influenced by personal preferences and the availability of information on alternative modes of transportation.

METHODOLOGY

This study uses a descriptive quantitative approach to analyze the demand and supply of school bus services in Singaraja City. Data were collected through a questionnaire survey of junior high school students as potential users, as well as interviews with the Transportation Agency and related agencies. The survey aimed to determine student travel patterns, frequency of vehicle use, and interest in using school buses.

In addition to primary data, this study also utilized secondary data in the form of regional maps, the number of students per school, the number of available fleets, and documentation of local transportation policies. A SWOT analysis was used to evaluate the strengths, weaknesses, opportunities, and threats in implementing school bus services. Meanwhile, Vehicle Operating Costs (VOC) were calculated to determine efficiency and operational budget requirements based on fixed and variable cost components, such as fuel, driver salaries, and vehicle maintenance.

RESULTS AND DISCUSSION

School Bus Demand Analysis in Singaraja City

An analysis of the potential demand for school bus services in Singaraja City was conducted based on a survey of students at Singaraja Junior High Schools 1, 2, 3, and 6. Of the 1,028 respondents, 832 students (80.93%) stated they would be willing to switch to using school buses if a service that was safe, comfortable, and met their needs was available.

The request was analyzed by considering several variables, including:

1. Student's residential address (Figure 5.2)
2. Travel distance to school (Figure 5.3)
3. Commonly used modes of transportation (Figure 5.4)
4. Family vehicle ownership (Figure 5.6)
5. Willingness to switch to school buses (Figure 5.8)

Based on an analysis of student residence locations, it was found that most students live within the reach of existing school bus routes. However, not all areas are optimally served, especially during peak school hours.

The distribution of respondents who are ready to switch covers two routes designed in this study, namely:

1. Route 1: Sukasada Terminal – Jl. Jelantik Gingsir – Jl. Mayor Metra – Jl. Veteran – Jl. Ngurah Rai – Jl. Letkol Wisnu – Jl. Gajah Mada – Jl. Dr. Sutomo – Jl. Diponegoro – Jl. Erlangga – Jl. Surapati – Jl. WR. Supratman – Penarukan Terminal (PP), with a potential user capacity of 76 students and a requirement for 4 buses.
2. Route 2: Penarukan Terminal – Jl. WR. Supratman – Jl. Surapati – Jl. Imam Bonjol – Jl. Dr. Sutomo – Jl. Pramuka – Jl. Ngurah Rai – Jl. Veteran – Jl. Mayor Metra – Jl. Jelantik Gingsir – Sukasada Terminal (round trip), with a potential user capacity of 756 students and a requirement of 35 buses.

This analysis reveals a significant demand for school bus transportation services, particularly in densely populated areas with students who either do not own their own vehicles or reside within a 3-kilometer radius of the school. Furthermore, students' desire to shift away from private vehicles suggests significant potential for reducing traffic volumes and the risk of student accidents if school bus services are fully developed.

SWOT Analysis to Improve the Effectiveness of School Bus Services

A SWOT analysis was conducted to identify and evaluate various internal and external factors that influence the effectiveness of school bus services in Singaraja City. This approach was used to formulate service development strategies based on strengths (Strengths, weaknesses, opportunities, and threats).

Identification of Internal and External Factors

Based on the results of the survey, field observations, and interviews with the Buleleng Regency Transportation Agency, the following factors were obtained:

Strengths

Free school bus service for students.

- Full support from the local government through the Department of Transportation.
- Regular operational schedule according to school entry and exit times.
- Using a large capacity bus (32 passengers).
- Provide a sense of security and reduce the risk of student accidents.

Weaknesses

The fleet is limited, only 2 active units.

- Route coverage is not optimal for all areas where students live.
- Lack of promotion and socialization of services to students and parents.
- There is no digital system for schedule or route information.
- Lack of coordination between schools and transport operators.

Opportunities

- High student interest (80.93%) in switching to school bus mode.
- Opportunities for integration with the Child-Friendly City program.
- Can be part of efforts to reduce congestion and pollution.
- Potential partnerships with the private sector or CSR for additional fleets.

Threats

High private vehicle ownership among students.

- The habit of people who are accustomed to private vehicles.
- Time competition with other, more flexible modes.
- Regional budget limitations for the procurement of additional fleets.

From the explanation above which comes from a focus group discussion with several related parties, then the grouping of internal factors and external factors. Regarding school bus services in Singaraja City, the information is as follows:

Table 1. List and Weighting of SWOT Factors for School Bus Services in Singaraja City

SWOT factors	Code	Factor Description	Weight	Rating	Score	Information
Strengths(S)	S1	Services are provided free of charge by the government	0.10	4	0.40	The main attraction for students and parents
	S2	Institutional support from the Department of Transportation	0.07	3	0.21	Ensuring long-term legality and operations
	S3	Operational schedule according to school entry/exit hours	0.08	3	0.24	Providing certainty of time
	S4	The bus capacity is quite large (32 passengers)	0.06	3	0.18	Efficient for transporting large numbers of students

SWOT factors	Code	Factor Description	Weight	Rating	Score	Information
	S5	Safe and reduces the risk of student accidents	0.09	3	0.27	Safety factors are a priority
Weaknesses(W)	W1	The number of fleets is very limited (2 units)	0.12	2	0.24	Not sufficient to meet actual demand
	W2	The route has not yet reached all student domiciles	0.10	2	0.20	Routes are limited to the downtown area.
	W3	Minimal promotion and outreach to students and parents	0.07	2	0.14	There are still many students who do not know about the service
	W4	No digital service information system available	0.06	1	0.06	Inefficient schedule/route access
	W5	Evaluation and monitoring of services is not optimal	0.05	2	0.10	No reports of occupancy or satisfaction
Opportunities(O)	O1	High student interest (80.93%) in using school buses	0.12	4	0.48	Huge opportunity for mode shift
	O2	The Child-Friendly City Program supports safe transportation	0.08	3	0.24	In accordance with national policy directions
	O3	Potential for cooperation with the private sector/CSR for fleet procurement	0.07	3	0.21	Non-APBD resource support
	O4	Opportunities to reduce traffic congestion and vehicle pollution	0.08	3	0.24	Long-term effects on city traffic
Threats(T)	T1	High private vehicle ownership among students	0.12	2	0.24	Main competitor in terms of comfort/flexibility
	T2	The culture of private vehicles that has been formed	0.09	2	0.18	Difficult to change without major intervention
	T3	Private mode is more flexible in terms of time and route	0.07	2	0.14	Bus schedules cannot be adjusted per individual.
	T4	Regional budget limitations for fleet expansion	0.07	2	0.14	Depends on government program priorities

The table presents the results of the identification of strategic SWOT factors that influence the effectiveness of school bus services in Singaraja City, complete with weighting, rating, and score calculation. Each factor, both internal (Strengths and Weaknesses) and external (Opportunities and Threats), is weighted based on its level of influence on the operational success of the service,

with a total weighting of 1.00. The rating assessment is carried out using a scale of 1 to 4, where the highest score indicates a stronger contribution or influence on service objectives. The final score is obtained from the result of multiplying the weight and rating of each factor.

From the internal factor perspective, the main strengths of the school bus service include the free service (S1), support from the Transportation Agency (S2), schedules adjusted to school start and finish times (S3), a large fleet capacity (S4), and safety aspects for students (S5). The total internal factor score (IFAS) is 2.04, indicating that the organization's strengths outweigh its weaknesses. Meanwhile, from the external factor perspective, the greatest opportunity lies in the high interest of students (80.93%) in using the school bus service (O1), as well as support from national policies through the Child-Friendly City program (O2). The total external factor score (EFAS) is 1.87, indicating that external opportunities can be optimally utilized even though several threats remain, such as the culture of private vehicles and limited regional budgets.

This table is the basis for compiling the IFAS and EFAS Matrices in the following tables, and serves as a reference in formulating appropriate SWOT strategies to improve the coverage and quality of school bus services in Singaraja City.

IFAS and EFAS Weighting

After identifying the SWOT factors influencing the effectiveness of school bus services in Singaraja City, the next step was to weight them to determine the relative influence of each factor. Weighting was applied to two main components: internal factors using the Internal Factor Analysis Summary (IFAS) Matrix and external factors using the External Factor Analysis Summary (EFAS) Matrix.

Table 2. IFAS Matrix (Internal Factors Analysis Summary)

Internal Factors	Weight Rating Score Information			
Strengths(Strength)				
Free school bus service from the government	0.10	4	0.40	Attractive to students and lighten the burden on parents
Support from the Department of Transportation	0.07	3	0.21	Providing operational stability and legality
Operational schedule according to school hours	0.08	3	0.24	Adapted to students' time needs
The bus capacity is quite large (32 passengers)	0.06	3	0.18	Capable of transporting large numbers of students
The safety aspect is more guaranteed	0.09	3	0.27	Reduces the risk of accidents compared to private vehicles
Weaknesses(Weakness)				
The fleet is very limited (only 2 units)	0.12	2	0.24	Not meeting the needs of students as a whole
The route has not yet reached all student domiciles	0.10	2	0.20	Restricting access for students living in the suburbs

Internal Factors	Weight Rating Score Information			
Lack of promotion and socialization	0.07	2	0.14	The service is not yet widely known by students and parents.
There is no digital service information system available yet	0.06	1	0.06	Schedules and routes cannot yet be accessed online
Evaluation and monitoring are not optimal	0.05	2	0.10	There is no daily reporting of occupancy and punctuality.
Total	1.00		2.04	

The table presents the Internal Factor Analysis Summary (IFAS) Matrix, which assesses the internal factors influencing the effectiveness of school bus services in Singaraja City. This matrix consists of two groups of factors: strengths and weaknesses, which have been weighted, rated, and assigned a total score. The calculation results in a total IFAS score of 2.04. This score indicates that the organization's internal strengths outweigh its weaknesses. This indicates that the school bus service has a strong internal foundation for further development.

The most prominent strength factor is the free service provided to students (S1), with the highest score of 0.40. This factor is considered very influential in attracting student interest and reducing the burden of transportation costs for families. In addition, institutional support from the Transportation Agency (S2), operational schedules that align with school hours (S3), and a sufficiently large bus capacity (S4) are also important strengths that support the efficiency and punctuality of the service. Meanwhile, the main weakness faced is the very limited number of fleets (W1), with a score of 0.24, indicating that this obstacle is quite significant. Other weaknesses that require attention are service routes that do not yet reach all student domicile areas (W2), and the lack of promotion and socialization of the service (W3). Weakness scores tend to be lower than strength scores, indicating that these weaknesses can still be overcome with appropriate strategies and policies.

Thus, this IFAS analysis demonstrates that internally, school bus services have potential for further development. Key strengths can be maximized, while existing weaknesses can be minimized through improved management, promotion, and service infrastructure development.

Table 3. EFAS Matrix (External Factor Analysis Summary)

External Factors	Weight Rating Score Information			
Opportunities				
High student interest (80.93%) in school buses	0.12	4	0.48	The potential for modal shift is huge
Supporting the Child-Friendly City Program	0.08	3	0.24	In accordance with the direction of the national policy on child-friendly transportation
Potential for cooperation with the private sector/CSR	0.07	3	0.21	Fleet funding alternatives
Reducing traffic congestion and pollution from private vehicles	0.08	3	0.24	Positive impact on the environment and city traffic
Threats				

External Factors	Weight Rating Score Information			
Private vehicle ownership is quite high	0.12	2	0.24	Making students reluctant to switch to public transportation
The culture of private vehicles has taken root	0.09	2	0.18	Difficult to change without policy intervention
Private mode is more flexible in terms of time/route	0.07	2	0.14	Compared to scheduled school transportation
Regional budget limitations	0.07	2	0.14	Become an obstacle in increasing the fleet
Total	1.00		1.87	

The table displays the EFAS Matrix, a summary of the external factor analysis, comprising opportunities and threats to the development of school bus services in Singaraja City. Each factor has been weighted, rated, and a total score calculated to determine its relative influence on service effectiveness. The calculation results in a total EFAS score of 1.87. This value indicates that overall, the influence of external opportunities is still greater than that of threats, although the difference is not very significant. This indicates that the external environment is quite supportive of the development of school bus services, but still requires anticipatory strategies to address several challenges.

The most dominant opportunity factor is the high interest of students in using school bus services (O1), with the highest score of 0.48. This presents a significant potential for increasing the number of users if the service is improved. In addition, the program's alignment with the Child-Friendly City policy (O2), potential collaboration with the private sector or CSR (O3), and contribution to reducing congestion and pollution (O4) are also strategic opportunities worth exploiting in service development. On the other hand, several external threats that have a fairly strong influence include the high level of private vehicle ownership among students (T1), with a score of 0.24, and the culture of private vehicle use (T2), which is difficult to change in a short time. In addition, the flexibility of private modes (T3) and limited regional budgets (T4) also become obstacles in expanding routes and adding to the fleet.

Based on the results of this EFAS analysis, it can be concluded that the strategy for developing school bus services needs to be directed at maximizing available opportunities, particularly in attracting student interest and establishing supporting partnerships, while anticipating threats through policy, education, and budget efficiency approaches.

Interpretation of IFAS and EFAS Matrices

After weighting and calculating the internal and external factors in the IFAS and EFAS Matrices, the next step is to interpret the scores obtained. This interpretation is used to determine the organization's strategic position and the policy direction needed to improve the effectiveness of school bus services in Singaraja City.

Interpretation of the IFAS Matrix

The IFAS matrix assesses the strengths and weaknesses of school bus services. Based on the calculations performed and presented in Table 5.11, the total IFAS score was 2.04. This value is above the neutral average (2.00), indicating that internal strengths outweigh weaknesses.

Some of the main forces that made a big contribution include:

1. The service is provided free of charge, thus greatly reducing the burden of students' transportation costs.
2. Institutional support from the Department of Transportation, which ensures operational sustainability.
3. Service schedules are adjusted to school hours, as well as student safety aspects which are superior values compared to private transportation modes.

Despite this, there are significant weaknesses that must be addressed, such as a limited fleet, routes not yet reaching all student areas, and a lack of an adequate digital information system. Overall, however, the IFAS score indicates that the organization's internal conditions are strong enough to support further development strategies.

Interpretation of the EFAS Matrix

The EFAS matrix assesses the influence of external factors in the form of opportunities and threats. Based on the calculations shown in Table 5.12, the total EFAS score was 1.87. This value is slightly below the ideal value (2.00), but still indicates that external opportunities have a greater influence than threats. A very potential opportunity factor is the high student interest in using school buses, which reached 80.93% based on the survey results. Furthermore, support for the Child-Friendly City policy and opportunities for collaboration with the private sector or CSR provide a strong foundation for service expansion. Another opportunity is the contribution of this service in reducing traffic congestion and vehicle emissions, especially around school areas. However, several threats still need to be considered, such as the high level of private vehicle ownership among students, the culture of using private vehicles for picking up and dropping off, and limited regional budgets for adding fleets and expanding routes.

SWOT Matrix

After identifying SWOT factors, weighting IFAS and EFAS, and quantitatively interpreting the internal and external conditions of school bus services, the final step in this analysis is to formulate a development strategy using the SWOT Matrix. The SWOT Matrix combines strengths, weaknesses, opportunities, and threats into four main strategic combinations: SO, WO, ST, and WT. Each strategy in the SWOT Matrix is designed to enhance the effectiveness and reach of school bus services by leveraging existing strengths, capitalizing on existing opportunities, mitigating weaknesses, and anticipating potential threats.

Tabel 4. SWOT Strategy Matrix for School Bus Services in Singaraja City

Internal/ External Factors	Strengths (S)	Weaknesses (W)
	1. Free service from the government Support from the Department of Transportation 3. Schedule according to promotion school hours 4. Large capacity 5. High available 5. Evaluation has not been safety aspects	2. 1. Limited fleet size 2. Routes have not reached all students 3. Minimal digital system 4. No digital system 5. Evaluation has not been carried out
Opportunities (O)	S-O 1. Use free services and institutional support to expand routes and increase fleet through CSR. 2. Emphasize safety aspects to attract students and parents. 3. Adjust schedule/route. the schedule to be more flexible to student interests.	Strategy W-O 1. Overcome fleet limitations by establishing private partnerships and applying for grants. 2. Create a simple application 3. Increase promotion through social media and school activities.
Threats (T)	S-T 1. Promote the image of school buses as a safe, affordable, and child-friendly mode of transportation to offset private mode of transportation. 2. Involve schools in educating densely populated student areas. 3. students to use school buses. 3. Develop a data-based evaluation Leverage the Child-Friendly City Program to gain cross-sector support.	Strategy W-T 1. Propose a gradual increase in the budget through the Regional Budget. 2. Conduct a trial of new routes in vehicles. 3. Develop a data-based evaluation satisfaction).

Table presents the results of the formulation of a school bus service development strategy in Singaraja City based on a combination of internal and external factors analyzed in the IFAS and EFAS Matrices. This table presents four main strategic combinations:

1. S-O Strategy (Strength-Opportunities)
2. W-O (Weakness-Opportunities) Strategy
3. S-T Strategy (Strength-Threats)
4. W-T Strategy (Weakness-Threats)

The S-O strategy leverages internal strengths to seize external opportunities. In the context of school bus services, this strategy includes utilizing free services and institutional support to expand route coverage and establishing partnerships with the private sector or CSR to expand the fleet. Safety and comfort are also key advantages to attract students and parents. The W-O strategy is aimed at addressing internal weaknesses to capitalize on existing opportunities. For example, to address fleet limitations and minimal promotion, strategies include developing service information applications, increasing outreach in schools and digital media, and establishing procurement collaborations with external partners. The S-T strategy focuses on leveraging strengths to address threats. This strategy includes affirming the image of school buses as a safe and child-friendly mode of student transportation and encouraging school involvement in supporting the transition from private vehicles to shared transportation.

Meanwhile, the W-T strategy is aimed at minimizing weaknesses and avoiding threats. This strategy includes submitting a phased budget through the Regional Budget (APBD), implementing trial routes in densely populated student areas, and establishing a regular service performance evaluation system. These four strategies complement each other and are designed to create sustainable, inclusive, and efficient service development. This SWOT matrix serves as an important basis for policy decisions regarding student transportation development in Singaraja City, which aligns with the Child-Friendly City program.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that school bus services in Singaraja City have significant potential for development as a safe and efficient means of student transportation. The demographic characteristics of junior high school students in this area indicate a high dependence on private vehicles, especially motorcycles. However, there is also significant interest among students in switching to public transportation if adequate services are available. Of the 1,028 respondents, 832 students indicated potential to become school bus users, indicating a significant opportunity for the local government to develop affordable and child-friendly public transportation for students. The calculations indicate a fleet requirement of 26 buses with a capacity of 32 passengers to serve two main routes covering the Sukasada and Buleleng areas. Although government subsidies and an adequate fleet support this program, several challenges remain, such as limited routes and operating hours, as well as competition from private vehicles. However, the economically measurable operational cost efficiency of the vehicles provides a strong basis for developing future financing and operational subsidy policies. The development of school bus services in Singaraja offers significant potential to improve the quality of public transportation for students while sustainably supporting the child-friendly city program.

FURTHER STUDY

Future research could explore a broader range of factors influencing school transportation, such as environmental sustainability, digital integration (e.g., real-time tracking or mobile booking apps), and the psychological well-being of students using public or private transport services. Comparative studies across different cities or provinces in Indonesia may also provide deeper insights into regional transportation challenges and policy effectiveness. In addition, a longitudinal study on student transport preferences and behavior over time could help policymakers and service providers design more adaptive, inclusive, and efficient school transportation systems.

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