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The Comparison Of Differences In The Service Quality Of Intercity Rail Transport In Thailand, Classified By Population Domicile

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Abstract
The Thai government places great importance on the development of rail infrastructure system with the aim of convenient and efficient travel and the safe mass transportation of goods. This development is expected to reduce energy costs and minimize air pollution caused by road transport. Moreover, it makes economic progress and contributes to improving the quality of life for Thai people in all regions. Therefore, the purpose of this research is to study the differences in the quality of intercity rail transport services in Thailand, classified by demographic groups. The research findings will be presented to relevant government agencies to implement in planning and developing service models that meet the needs of clients or passengers in each region where railway lines currently exist or are planned for the future.

The researcher used a questionnaire to collect the data. The population and sample consisted of 400 individuals who used services at railway stations. A multistage sampling technique was implemented, including stratified sampling and quota sampling. Descriptive statistics were used to analyze frequency and percentage, while the overall and specific importance levels of service quality were analyzed using means and standard deviations. One-way ANOVA and pairwise comparison methods were employed to analyze differences in service quality.

The results of comparative study of intercity rail transport service quality in Thailand based on population domicile revealed that the importance levels of service quality in the areas of personnel and train car quality across different regions of residence are significantly different.

Keywords: *Service Quality, Rail Transport, Quality of Life.*

1. INTRODUCTION

Infrastructure development is a crucial element in laying the foundation for economic growth, enhancing competitiveness, and attracting investment, while also improving the quality of life for citizens. Therefore, the government has implemented transportation policies to support improvements in living standards, convenience in travel, commerce, and logistics. This includes enhancing the efficiency of the rail (train) transport system and aiming to elevate its standards for long-term advancement. The Ministry of Transport has been assigned to draft a 20-year strategic plan (2018-2037) for transportation infrastructure development, with a project to promote and expand railway services to distribute growth to the regions. This aims to drive economic development, facilitate transportation, and boost tourism to local areas more quickly (Komchadluek, 2021). The government expects that, once completed, the project will encourage more people to use railways for travel and freight transport, thereby reducing transportation costs, creating jobs, and increasing personnel development in the rail industry (Thairath, 2020). This is anticipated to enhance citizens' quality of life, drive Thailand's economic growth, and allow seamless integration with neighboring countries' transportation systems in line with Thailand's Transport Infrastructure Development Plan 2015–2022 (Bangkokbiznews, 2024).

Currently, the railway network serves all regions across northern, northeastern, southern, eastern, and western routes, covering 47 provinces with a total length of 4,044 kilometers. In the future, additional routes of 2,419 kilometers will be added, increasing the total distance to 6,463 kilometers and extending service to cover 61 provinces. It is expected that passenger volume will double within the next 10 years (as shown in Figure 1).

Railway Passenger Volume from 2022 to 2032 (People/Day)

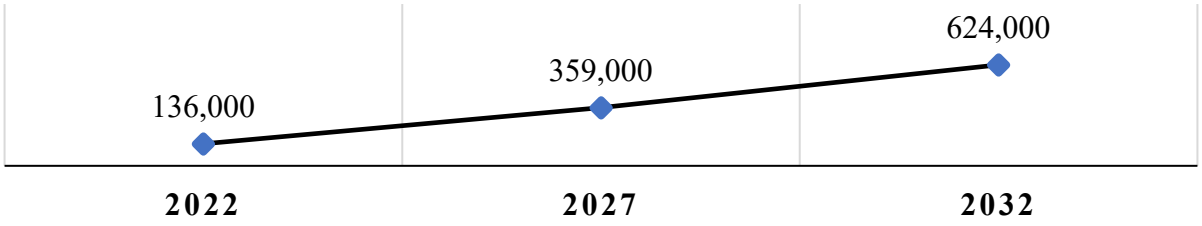

Figure 1: Railway Passenger Volume from 2022 to 2032 (State Railway of Thailand, n.d.)

Although railway routes cover a large area, they still do not reach all regions, leaving a significant portion of the population without access to rail services. Compared to other forms of transportation, travel and freight transport behaviors reveal that most people continue to rely primarily on road transport, including private vehicles and public transit. At the same time, there are long-standing issues with infrastructure, such as the safety conditions of railway tracks, locomotives, coaches, and various aging, deteriorated equipment, due to insufficient government budget support (MGR Online, 2024). Regular operating losses often require financial aid from the national budget, and there are occasional reports of corruption along with complaints about service quality (Office of the Ombudsman, 2022). These issues have contributed to the public's lack of confidence in the railway system. Furthermore, the COVID-19 pandemic has led to a decline in the average daily number of railway passengers, as shown in Figure 2.

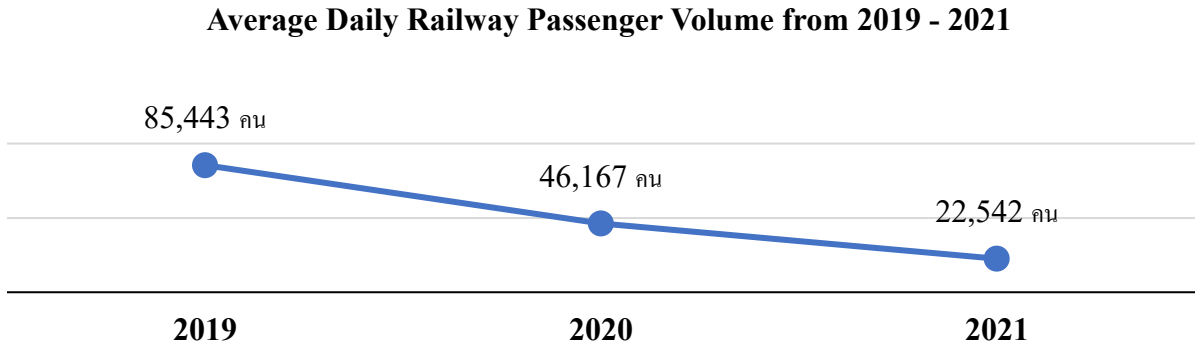

Figure 2: Trends in Average Daily Railway Passenger Volume from 2019 to 2021 (Department of Rail Transport, 2021)

The government places great emphasis on developing rail infrastructure with the aim of connecting travel and freight transport safely and efficiently, reducing energy costs, and mitigating air pollution by decreasing reliance on road transport. Most importantly, the rail transport system is expected to drive economic progress and improve the quality of life for all Thai citizens in every region. However, the living conditions in each region differ, including factors such as environmental quality, safety, access to development and learning, infrastructure, and public services. These disparities lead to unequal access to resources. For instance, the mortality rate from road accidents is higher in rural areas than in Bangkok, partly because the capital offers a more diverse range of public transport options (Bank of Thailand, 2023). Consequently, the demand for service quality in rail transport may vary across regions.

Given this context, the researcher is interested in studying the differences in the service quality of intercity rail transport in Thailand, categorized by demographics. The findings will be presented to relevant government agencies for use in planning and designing services that meet the needs of rail users in different regions with railway access, both now and in the future. Such an approach can help address socio-economic issues and contribute to improving the quality of life for the population. Furthermore, it will elevate the standards of rail transport, enhancing the country's competitiveness while supporting national policies and strategies to achieve their goals.

2. RESEARCH OBJECTIVES

1. To analyze the level of importance of each aspect of the service quality of intercity rail transport in Thailand.
2. To compare differences in the service quality of intercity rail transport in Thailand across various aspects, classified by population domicile.

3. LITERATURE REVIEW

Competitiveness in business requires delivering the best possible service to ensure customer satisfaction during every interaction. This not only meets the immediate needs of customers but also aligns with the evolving consumer behavior trends influenced by modern living standards. As living conditions improve, consumers increasingly demand convenient, fast, tailored, and reliable services (Luangpatrawong, B., 2022). Providing quality service involves actions or operations designed to satisfy the other party's needs, resulting in comfort, convenience, and satisfaction (Raksa, W., 2022). These concepts highlight the importance of exceeding customer expectations in service delivery.

Rail transport has long been a convenient travel option for the public, yet it is notoriously associated with delays. Complaints frequently arise regarding significant deviations from scheduled train times, which often disrupt passengers' subsequent activities (Thailand Consumers Council, 2023). However, the completion of rail transport development projects is expected to make travel and freight services more convenient and faster, potentially reducing punctuality-related issues. Despite these improvements, other issues remain prominent in the railway system. Complaints have been filed about passenger safety, including incidents of personal harm and theft aboard trains. The lack of railway police further exacerbates passengers' sense of insecurity during train journeys (MGR Online, 2023). Recognizing that safety is paramount, the State Railway of Thailand plans to increase its workforce to ensure sufficient staffing levels for more efficient and secure passenger services (Voice Online, 2018).

Additionally, cleanliness issues within train coaches and stations remain a frequent subject of complaints. Reports include bedbugs infesting seat cushions, causing itchy bites to numerous passengers, and strong odors emanating from restrooms in stations and onboard trains. In response, the State Railway of Thailand announced heightened measures to improve cleanliness and safety, aiming to boost passenger confidence in train travel (Government Contact Center, 2022). Passengers have generally expressed high satisfaction with cleanliness, especially following the outbreak of the coronavirus pandemic (Magheswari, G. V., 2023). However, the poor condition of train coaches and tracks also poses safety concerns. Issues such as aging train cars, broken doors and windows, or malfunctioning equipment have led to passenger hazards and significantly impacted satisfaction levels. Improving the condition of train coaches could positively influence passengers' perceptions and lead to greater satisfaction with railway services (Chia, S. H., & Nor, A. A. H., 2021).

Today, railway stations are not merely transportation hubs where journeys begin and end; they also serve as central locations for people to meet and hold meetings. Therefore, additional amenities should be provided, such as internet technology for travelers (e.g., Wi-Fi hotspots, charging stations), improved connectivity with other urban transportation systems (Coppola, P., & Silvestri, F., 2020), and retail shops or cafés. These facilities would allow passengers to eat, shop, or read while waiting for their trains (Otsuka, N., & Reeve, A., 2024). Moreover, services should cater to all passengers, including those with disabilities, the elderly, children, pregnant women, and travelers with large luggage, ensuring convenient boarding and alighting. Enhancing convenience by enabling passengers to book and purchase tickets more easily could encourage more people to choose rail travel (Purnomo, F. M., & Indarwati, T. A., 2023). Service providers should therefore improve the quality of their services and online ticketing systems to increase passenger satisfaction (Sari, M. N., & Dirbawanto, N. D., 2023).

4. RESEARCH METHODOLOGY

The research titled "The Comparison of Differences in the Service Quality of Intercity Rail Transport in Thailand, Classified by Population Domicile" is a quantitative study. The research methodology is as follows:

1. The population and sample group consisted of 400 passengers using railway services. The sample size was determined using Yamane's formula (Yamane, T., 1973) (with a 95% confidence level and a margin of error of 0.05). The sampling was conducted through multi-stage sampling, including stratified random sampling and quota sampling. The quotas included: Group 1: 80 participants with domicile in the Northern region, Group 2: 80 participants with domicile in the Southern region, Group 3: 80 participants with domicile in the Northeastern region, Group 4: 80 participants with domicile in the Eastern region, Group 5: 80 participants with domicile in the Central region.

2. Data was collected using questionnaires. The questionnaires were developed based on a review of relevant research and studies, as well as input from the researcher, to align with the research objectives. The questionnaire included: Section 1: General information about the sample group (Check List format). Section 2: Assessment of the importance of service quality dimensions (5-point Likert scale; Likert, R., 1932), covering: Tangible, Reliability, Responsiveness, Empathy, Assurance, and Convenience. Section 3: The comparison of differences in service quality of intercity rail transport, classified by passengers using rail travel in five regions (Northern, Northeastern, Eastern, Southern, and Central).

3. The content validity of the questionnaire was assessed using the Index of Item-Objective Congruence (IOC) method. Five experts reviewed the questions, yielding an IOC score between 0.60 and 0.80, meeting the standard criteria (Rovinelli, R. J., 1976). The questionnaire was then tested on a group of 30 non-sample participants (Burns, N., & Grove, S. K., 2001). The reliability of the data was analyzed using Cronbach's alpha coefficient, which resulted in a value of 0.96, indicating high reliability and suitability for data collection (Cronbach, L. J., 1951).

5. DATA ANALYSIS

The analysis of demographic data was conducted using descriptive statistics to determine frequency and percentage. For the analysis of the overall and specific dimensions of service quality importance, descriptive statistics were used to calculate the mean and standard deviation.

To analyze the level of importance of service quality, descriptive statistics were applied to compute the mean ($\bar{X}$) and standard deviation (S.D.).

The comparison of differences in the service quality of intercity rail transport in Thailand, classified by demographics, was conducted by categorizing participants based on their domicile in the Northern, Southern, Northeastern, Eastern, and Central regions. Since the sample consisted of more than two groups, one-way analysis of variance (ANOVA) was used. Pairwise comparisons were conducted using Scheffé's method to identify significant differences.

6. RESULTS

1. Demographic Analysis of the Sample Group (400 Participants), the results are detailed in Table 1.

Table 1: Frequency and Percentage of Demographic Data for the Sample Group

Demographic Data	Frequency	Percentage
1. Gender		
Male	215	53.75
Female	185	46.25
2. Marital Status		
Single	213	53.25
Married	187	46.75
3. Education Level		
Below Bachelor's Degree	103	25.75
Bachelor's Degree	240	60.00
Above Bachelor's Degree	57	14.25
4. Occupation		
Student	39	9.75
Government Officer/State Enterprise Employee	133	33.25
Company Employee	131	32.75
Business Owner	38	9.50
Freelance	59	14.75
5. Monthly Income		
≤ 15,000 Baht	90	22.50

	15,001 – 25,000 Baht	134	33.50
	25,001 – 35,000 Baht	78	19.50
	≥ 35,001 Baht	98	11.75
6. Domicile			
	Northern Region	80	20.00
	Southern Region	80	20.00
	Northeastern Region	80	20.00
	Eastern Region	80	20.00
	Central Region	80	20.00
7. Service Usage Days			
	Weekdays (Monday–Friday)	121	30.25
	Weekends (Saturday–Sunday)	134	33.50
	Long Holiday	145	36.25

From Table 1, the majority of the sample group were male (215 participants, 53.75%), single (213 participants, 53.25%), and held a bachelor's degree (240 participants, 60.00%). Most were government officers or state enterprise employees (133 participants, 33.25%), with a monthly income of 15,001–25,000 Baht (134 participants, 33.50%). The most common days for service usage were long holiday/festival periods (145 participants, 36.25%). Participants were equally distributed across the Northern, Southern, Northeastern, Eastern, and Central regions, with 80 participants (20.00%) in each region.

2. Results of the analysis of importance levels of the service quality for intercity rail transport, classified by population domicile which are Route 1: Northern Region, Route 2: Southern Region, Route 3: Northeastern Region, Route 4: Eastern Region, and Route 5: Central Region. The findings are shown in Table 2.

Table 2: Mean ($\bar{X}$) and Standard Deviation (S.D.) of Importance Levels of the Service Quality for Intercity Rail Transport

Service Quality Aspects	$\bar{X}$	S.D.	Level of Importance
1. Employee	4.49	0.65	Highest
2. Station	4.46	0.66	Highest
3. Coach	4.50	0.71	Highest
4. Safety	4.45	0.70	Highest
5. Convenience	4.33	0.74	Highest
Overall	**4.45**	**0.61**	**Highest**

From Table 2, the overall importance level of the service quality for intercity rail transport was rated at the highest level ($\bar{X}$= 4.45). When analyzing individual service quality aspects, all were rated at the highest importance level. Ranking the aspects from highest to lowest mean scores: Coach (($\bar{X}$= 4.50), Employee ($\bar{X}$= 4.49), Station ($\bar{X}$= 4.46), Safety ($\bar{X}$= 4.45), and Convenience ($\bar{X}$= 4.33) respectively.

3. Results of comparing the differences of service quality in intercity rail transport in Thailand, classified by population domicile are Route 1: Northern Region, Route 2: Southern Region, Route 3: Northeastern Region, Route 4: Eastern Region, and Route 5: Central Region. The findings are shown in Table 3.

Table 3: Statistical Measures Used to Compare Differences in Mean Importance Levels of Service Quality of Intercity Rail Transport, Classified by Population Domicile

Service Quality Aspects	F-Value	P-Value
1. Employee	3.21	0.01*
2. Station	1.50	0.20
3. Coach	2.41	0.05*

4. Safety	0.97	0.42
5. Convenience	1.99	0.10
Overall	**2.12**	**0.08**

* Statistically significant at the 0.05 level

From Table 3, the analysis of comparing the differences in service quality of intercity rail transport in Thailand, classified by population domicile showed the following: Overall, there were no statistically significant differences at the 0.05 level. When comparing individual service quality aspects: The aspects of Station, Safety, and Convenience did not show statistically significant differences at the 0.05 level.
The aspects of Employee and Coach showed statistically significant differences at the 0.05 level.

Table 4: Mean of Pairwise Comparisons of Differences in the Service Quality of Intercity Rail Transport in Thailand (Employee Aspect) by Population Domicile

Domicile	$\bar{X}$	Northern	Southern	Northeastern	Eastern	Central
		4.46	4.32	4.46	4.67	4.54
Northern	4.46		0.14	0.01	-0.21	-0.08
Southern	4.32			-0.14	-0.35*	-0.22
Northeastern	4.46				-0.21	-0.08
Eastern	4.67					0.13
Central	4.54					

* Statistically significant at the 0.05 level

From Table 4, the results of pairwise comparisons of employee-related service quality in intercity rail transport classified by population domicile indicate the following: A statistically significant difference at the 0.05 level was found in one pair. Residents from the Eastern Region gave higher importance to employee-related service quality than residents from the Southern Region.

Table 5: Mean of Pairwise Comparisons of Differences in the Service Quality of Intercity Rail Transport in Thailand (Coach Aspect) by Population Domicile

Domicile	$\bar{X}$	Northern	Southern	Northeastern	Eastern	Central
		4.49	4.33	4.54	4.67	4.49
Northern	4.49		0.16	-0.06	-0.19	0.00
Southern	4.33			-0.21	-0.34	-0.15
Northeastern	4.54				-0.13	0.06
Eastern	4.67					0.19
Central	4.49					

* Statistically significant at the 0.05 level

From Table 5, the results of pairwise comparisons of coach-related service quality in intercity rail transport classified by population domicile indicate that: There are no statistically significant differences at the 0.05 level among any of the pairs.

7. DISCUSSION

The researcher analyzed the data and drew conclusions based on references to relevant literature and research, as follows:

The sample group of 400 individuals rated the importance of all aspects of service quality at the highest level overall. When considered by individual aspect, the service quality of all 5 areas was also rated at the highest level of importance. This indicates that people from all regions have similar expectations for high-quality rail services. Therefore, the State Railway of Thailand must prioritize service quality, as it significantly influences people's intention to use intercity rail services (Wisutwattanasak, P., et al., 2023). These findings are consistent with the study by Gözde, Y., & Sait, G. (2022), which found that service quality in rail transport significantly impacts customer satisfaction and loyalty, influencing their decision to return to use the service. Improving the quality of rail services should be considered a key issue for developing an efficient rail transportation system. The specific factors of rail service quality should be utilized as a guideline for service planning to meet the needs of all passenger groups (Tanaiutchawoot, N., et al., 2024).

Discussion on the importance of service quality, the researcher focused on the top 2 aspects with the highest average scores for service quality importance. The service quality of train coaches had the highest average score. This could be attributed to the lack of maintenance for coaches in Thailand, which has resulted in damaged interiors and malfunctioning equipment, leading to inconvenience for passengers. Issues such as uncleanliness, bedbugs embedded in seat cushions biting passengers, and strong odors from restrooms are significant concerns. Since passengers often endure long travel durations, they place particular importance on the quality of coaches. Improving the condition of train cars would positively influence passenger perception, leading to higher satisfaction with rail services (Chia, S. H., & Nor, A. A. H., 2021). Furthermore, it ensures safety, efficiency, and passenger satisfaction. Effective maintenance planning for train coaches, based on service conditions, is essential (Radomir, B., Zivoslav, A., & Milan, B., 2022). This aligns with the findings of Giwa, G. (2024), who highlighted that maintaining cleanliness inside train cars is a critical aspect of tangible service quality. Cleanliness significantly enhances passenger perception and satisfaction, increasing the likelihood of repeat service usage (Chia, S. H., & Nor, A. A. H., 2021). Therefore, cleanliness is a key factor in railway service quality. However, Ratchadapornwan Mungmai (2023) suggested that the top priority for improvement should be the train coaches and railway tracks, as they are tangible components that ensure long-term safety and adapt to changing passenger needs. The aging condition of coaches, broken equipment, and poorly maintained tracks pose safety risks. Improving these areas would enhance passenger perception and satisfaction with rail services (Chia, S. H., & Nor, A. A. H., 2021). Similarly, the study by Sangthong, M., Seapoo, K., & Aotrit, S. (2022) emphasized that using new, attractive, and well-designed train cars would significantly enhance passenger impressions of the service. To ensure safety, efficiency, and passenger satisfaction, maintenance planning for train cars based on service conditions is crucial (Radomir, B., Zivoslav, A., & Milan, B., 2022).

The service quality of employees had the second-highest average score, indicating that railway employees are a crucial factor in creating positive first impressions for passengers. However, many railway employees have faced complaints in the past regarding their service etiquette (MGR Online, 2014) and shortcomings in their duties, such as coordination and providing accurate train schedules to passengers (Office of the Ombudsman, 2022). Improving employee behavior could significantly enhance the passenger experience and overall customer satisfaction. This aligns with the findings of Patrícia, S., et al. (2024), which revealed that enhancing employee training to improve communication skills and responsiveness to passenger needs can help attract new passengers to railway services. Therefore, railway organizations should encourage employees to exhibit proactive behavior in resolving customer issues promptly (T., Aditya, Sai, Srinivas., et al., 2024). This approach would contribute to a better perception of the service and encourage repeat usage.

The result of comparing differences in the importance of intercity rail transport service quality in Thailand by population domicile show differences in the importance of service quality regarding employees and train coaches. The researcher discusses the findings as follows: The difference in the importance of employee service quality stems from variations in the attitudes, values, perceptions, and cultural backgrounds of employees working along different routes. These factors lead to inconsistent service behavior, resulting in passengers frequently using certain routes experiencing poorer service compared to others. This dissatisfaction creates a desire for improvement in employee service quality. This issue could be addressed by providing employees with training to develop communication skills and emotional flexibility, enabling them to adapt, understand, and respond to passenger needs (Mathieu, L., et al., 2023). Additionally, fostering friendliness and providing support to passengers without discrimination would enhance passenger satisfaction (Saengpacharthai, C., 2021). This aligns with the findings of Srathongyoo, N. (2019),

which indicated that employee service quality significantly affects passenger satisfaction. Similarly, the study by Onthong, S., Phattaba, W., & Prommai, P. (2022) found that railway employees who understand and are familiar with passengers can instill confidence, increasing passenger satisfaction and repeat usage. Regular training and development activities should be organized for railway employees to enhance their knowledge, skills, experience, and attitudes positively (Emnoi, C., & Chotpittayanon, N., 2024). Training is essential for improving employee skills and knowledge in the railway service industry, ensuring safety standards, efficiency, and passenger satisfaction (Smith, A. P., et al., 2018). Furthermore, effective training programs tailored to enhance employee skills and service knowledge are vital. They should align with passenger expectations to encourage repeat usage, thereby increasing competitiveness and organizational performance.

Results of comparing differences in the importance of intercity rail transport service quality in Thailand by population domicile show the importance of Coaches service quality likely stem from passengers on certain routes frequently encountering issues such as malfunctioning or unusable train carriages. Despite complaints, these issues remain unresolved. The train carriages in service are often over 20 years old, leading to difficulties in procuring spare parts as some foreign manufacturers have ceased producing older models. This situation has caused passengers to feel unsafe (MGR Online, 2008), prompting a desire for improvements to restore confidence in using the service. This aligns with the findings of Chia, S. H., & Nor, A. A. H. (2021), which revealed that well-maintained train carriages significantly enhance passenger satisfaction by providing better experiences. This positively influences passenger perceptions, leading to increased satisfaction with rail services. Additionally, during holiday periods, when many people travel back to their hometowns, the number of coaches often falls short of the demand. Passengers might wish for the State Railway of Thailand (SRT) to prepare an adequate number of carriages to accommodate the increased travel demand during these times. Currently, the SRT has added more coaches to facilitate public travel, reduce overcrowding, offer more options to passengers, and plans to continue expanding services to meet the population's travel needs. The SRT also inspects and renovates train coaches to ensure sufficient availability. Incorporating modern technology within coaches to enhance convenience, such as improved luggage storage systems (Urairat, W., Deejongki, S., & Rojsuwan, B., 2021), as well as maintaining clean restrooms (Phimngam, K., et al., 2021), is crucial. Installing surveillance cameras throughout the coaches can also increase travel safety and peace of mind (PPTV Online, 2016). Therefore, improving train coaches to allow passengers to perceive high-quality service is vital in building trust in the service. Such improvements may also contribute to increasing passenger usage (Nedeliaková, E., Valla, M., & Masár, M., 2024).

8. RECOMMENDATIONS

Service quality remains a crucial factor for the public in every region. Beyond enhancing service quality to ensure it is perceived positively by users, it is essential to maintain consistent service quality standards across all routes used by passengers. This consistency will build public trust and encourage them to continue choosing rail transport. Additionally, after the completion of rail route development projects and the public begins to use the improved services, it is recommended to follow up and gather feedback from passengers. This feedback should then be used to address and resolve issues, ensuring passengers experience convenience and satisfaction. Meeting these expectations will promote the continued use of the rail system for both passenger travel and freight transport.

9. ACKNOWLEDGEMENTS

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