YANGON UNIVERSITY OF ECONOMICS
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ASSESSMENT ON UPGRADING RAILWAY STATIONS IN YANGON
(CASE STUDY: HLAING TOWNSHIP)

THANDAR AUNG
EMDevS II- 51 (19th BATCH)

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A thesis submitted in partial fulfillment of the requirements for the Master of Development Studies (MDevS) Degree

Supervised by

Dr. Tin Tin Wai
Pro-Rector
Yangon University of Economics

Submitted by

Thandar Aung
Roll No. 51
EMDevS- 19th Batch
(2023-2025)

JUNE, 25

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This is to certify that the thesis entitled "Assessment on Upgrading Railway Stations in Yangon (Case Study: Hlaing Township)" submitted as partial fulfillment towards the requirements for the degree of Master of Development Studies has been witnessed by the Board of Examiners.

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(Examiner)
Professor
Department of Economics
Yangon University of Economics

JUNE,2025

ABSTRACT

This study examines the current development of railway infrastructure, with a particular focus on upgrading railway stations in Hlaing Township as part of the Yangon Circular Railway System and to analyze the effectiveness and progress of the station development upgrades. Primary data were gathered through surveys and interviews with residents, passengers, and railway staff, while secondary data came from Myanmar Railways. Findings reveal that station upgrades enhanced passenger experiences through better lighting, cleanliness, and safety. However, issues remain, including limited seating, lack of information, and poor conditions on trains. Residents expressed a desire for modern amenities such as digital displays, online ticketing, and Wi-Fi. While infrastructure upgrades contribute positively to local development, the study emphasizes the need for improved service quality, affordability, and equal attention to all stations. Addressing these challenges through effective management and passenger-focused services can foster public trust, increase railway usage, and support sustainable urban development in Yangon.

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Thandar Aung
EMDevS II – 51
EMDevS 19th Batch
(2023-2025)

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LIST OF ABBREVIATIONS

CBD	Central Business District
CCTV	Closed-Circuit Television
CO	Carbon Monoxide
DEMUs	Diesel Electric Multiple Units
EIT	European Institute of Innovation and Technology
GDP	Gross Domestic Product
HDI	Human Development Index
HSR	High-Speed Rail
JICA	Japan International Cooperation Agency
MR	Myanma Railways
ODA	Japanese Official Development Assistance
RBE	Rail Bus Engines
TFP	Total Factor Productivity
TOD	Transit-Oriented Development
USD	United States Dollar
Wi-Fi	Wireless Fidelity

CHAPTER I
INTRODUCTION

1.1 Rationale of the Study

Transportation is a fundamental component of regional development, enabling the movement of people and goods while creating time and place utility. In Myanmar, transportation systems particularly railways have long served as critical infrastructure for economic and social connectivity. Among various modes such as road, air, and water transport, the railway system remains a cost-effective and environmentally friendly option, especially for urban and suburban mobility.

Yangon, as the commercial capital of Myanmar, experiences increasing urbanization and population density, leading to significant traffic congestion and transportation challenges. The Yangon Circular Railway, which runs through key urban and suburban areas, plays an essential role in daily commuting for thousands of residents. However, many railway stations along this route, particularly in suburban townships such as Hlaing, are outdated and lack essential infrastructure and services. Issues such as poor accessibility, inadequate passenger facilities, and deteriorated platforms reduce the efficiency and attractiveness of railway transport.

The development and modernization of railway infrastructure in Yangon, especially in areas like Hlaing Township, are therefore critical for improving public transportation. Upgrading these stations can reduce road traffic congestion, enhance commuter convenience, and support sustainable urban mobility. Furthermore, improved railway stations can stimulate local economic activity by encouraging small businesses and enhancing access to services.

Despite ongoing efforts by Myanmar Railways and international development partners, challenges remain in ensuring that station upgrades meet modern standards and address the real needs of commuters. Therefore, this study aims to assess the current conditions of railway stations in Yangon using Hlaing Township as a case study and to evaluate how targeted infrastructure improvements can contribute to regional connectivity and community development.

1.2 Objective of the Study

The objectives of this study are to examine the current development of railway infrastructure, with a particular focus on upgrading railway stations in Hlaing Township as part of the Yangon Circular Railway System and to analyze the effectiveness and progress of the station development upgrades.

1.3 Method of Study

This study uses descriptive analysis. The primary and second data are used in this study. For Primary data, the survey is conducted through questionnaires for residents nearby stations. Surveys is focused on assessing the socio-economic impacts on development of railway infrastructure in the selected areas. Respondents are interviewed for each railway station in Hlaing Township, including railway staff and passengers. For Secondary data, existing upgrading infrastructure development of Yangon Circular Railway System is collected from Myanmar Railways.

1.4 Scope and Limitations of the Study

The study focuses on the Yangon Circular Railway over the period from 2018 to 2024, with a special emphasis on improvements of the stations of Yangon Circular Railway located in Hlaing Township (Kamayut, Thiri Myaing and Okkyin Stations), Yangon. The survey is conducted with a questionnaire about passengers' satisfaction on recent station development, and it is collected from 100 respondents. The study period is from March to June 2025.

1.5 Organization of the Study

This study is organized into five chapters. Chapter One provides an introduction, including the rationale, objectives, scope and limitations, research methods, and structure of the study. Chapter Two presents a review of relevant literature on urban transport, highlighting the role of transportation in economic development. Chapter Three explores the historical background of railway transportation and railway transportation in Yangon city. Chapter Four examines the current situation of the Yangon Circular Railway, with a special focus on the upgrading of railway stations in Hlaing Township. Chapter Five presents the conclusions of the study along with key findings and recommendations.

CHAPTER II
LITERATURE REVIEW

2.1 The Importance of Transportation in Economic Development

Transportation links people, goods, and services at local to global levels. It is widely accepted that countries with better transport systems achieve higher economic growth and improved welfare. Transport systems are socially and economically important, and the effects of investment in this area can last for many years. Good transport infrastructure not only supports economic growth but also contributes to people's well-being. However, it is important to understand how strong this relationship is and which development factors are most affected. Common indicators of economic development include GDP, the Human Development Index (HDI), and income distribution. The impact of transport infrastructure also depends on the size, quality, and efficiency of the transport network. (Reis et al., 2020).

Each mode of transportation rail, road, air, and maritime plays a unique role in supporting economic development, with distinct advantages and limitations. The impacts of these transport modes vary depending on factors such as cost, speed, capacity, environmental footprint, and geographic accessibility. For instance, road networks are typically more flexible and suitable for short to medium distances, while railways are efficient for high-capacity freight and long-distance travel. Air transport provides speed but is costlier and more limited in cargo capacity, while maritime transport is essential for international trade due to its ability to carry large volumes at relatively low cost. Research by Gaus and Link (2020) in Germany highlights the differentiated impact of transport modes on regional economic performance. Their study found that both the quantity (e.g., network size) and quality (e.g., reliability, modernisation) of transport infrastructure significantly influence regional output.

Transport investment plays a significant role in driving economic development by creating employment and raising income levels. One of the most immediate effects comes from the direct creation of jobs during the construction, maintenance, and operation of transport infrastructure. These include not only on-site construction workers but also engineers, planners, equipment operators, and supporting roles in

related sectors. In addition to direct employment, there are substantial indirect and induced effects. Investment in transport stimulates demand across the supply chain such as in manufacturing, materials production, and logistics which further supports job creation in industries that supply goods and services to transport projects. These multiplier effects enhance overall economic activity and regional income levels. According to a 2020 report by the American Public Transportation Association (APTA), every $1 billion invested in public transit supports approximately 50,000 jobs and results in a $5 billion boost in GDP.

2.2 Railway Transportation and Economic Development

The railway system plays a vital role in the development and overall growth of an economy. It is often referred to as the "engine of economic activity" due to its importance in both production and distribution processes. Railways help to connect different regions, including rural and remote areas, thereby improving access and integration. As a core component of a national transport system, rail transport offers several advantages, such as high capacity, safety, and cost efficiency over long distances. These features make it well-suited to serve as the central element in a country's transportation network.

Chen et al. (2016) found that railway development in China led to a 10.3% increase in GDP between 2002 and 2013. This growth was mainly driven by higher production levels resulting from improvements in the railway network. Similarly, Chen and Vickerman (2016) reported that high-speed rail (HSR), which serves passenger transport, had a positive economic impact on cities in the Yangtze River Delta. The introduction of HSR improved job accessibility across China and reduced travel times by 45% (Zhang and Liu, 2017).

Improved rail connectivity also supports economic growth indirectly by encouraging private investment, industrial clustering, and easier trade (Chen and Li, 2021; Alotaibi et al., 2022). However, the relationship is not always positive; Acheampong et al. (2022) warn that poor project choices or inefficient old rail systems can even harm growth (Lenz et al., 2018; Maciulyte-Sniukiene and Butkus, 2022). Therefore, careful planning and project evaluation are essential to fully realize economic benefits.

Rail infrastructure investments also create jobs, both directly and indirectly. During construction, employment rises in sectors like materials supply, construction, and engineering (Gnap et al., 2021; Sobieralski, 2021; Wu et al., 2021). Indirectly, better rail access lowers transport costs and encourages new business activity near rail lines, increasing local employment (Pokharel et al., 2023; Yii et al., 2018; Sobieralski, 2021; Chi, 2015). Moreover, Bangaraju et al. (2022) highlight that improved transport makes regions more attractive for investment.

At the regional level, rail investments help link urban and rural areas and support market integration, promoting regional development (Alotaibi et al., 2022). Yet, Cascetta et al. (2020) argue that for rail infrastructure to fully benefit a region, supportive institutions and human capital development must be in place. The movement of labor and resources also influences the economic returns from such investments (Banerjee et al., 2020). Overinvesting in areas without these foundational factor's risks wasting resources (Yii et al., 2018).

From an economic development perspective, railways generate significant employment opportunities across a range of sectors, including rolling stock construction, track installation, operations, and maintenance. Rail investment also stimulates related industries such as steel production and transport engineering, contributing to broader industrial growth. Moreover, rail is considered one of the safest modes of land transportation, second only to air travel (Rodrigue, 2020).

Historically, rail systems were heavily regulated and subsidized by governments, mainly due to national strategic priorities. Public investment helped establish rail monopolies with vertically integrated operations. However, recent decades have seen significant deregulation in the sector, with many countries allowing private operators to enter the market and improve efficiency through competition (Rodrigue, 2020).

2.3 Benefits of Railway Transport

Rail transportation offers several economic advantages that make it an essential mode for the movement of goods and passengers over long distances. One of the primary benefits is its ability to expand market areas by supporting the transportation of bulk goods such as grains, chemicals, and metals, as well as passenger services. In the United States, for example, the average rail freight haul is about 1,300 km, nearly

double that of road transport, which averages around 700 km (Rodrigue, 2020). The integration of rail with other transport modes (intermodal transport) has enhanced its specialization and efficiency, especially between seaports and inland terminals.

Rail transportation also provides substantial capacity advantages. A single rail wagon can carry up to 100 tons of cargo, which is more than three times the capacity of a typical truck. Moreover, rail systems benefit from economies of scale, as unit trains and double-stacked containers can be used when infrastructure permits (Rodrigue, 2020). These features allow rail to handle peak loads and growing demand efficiently.

In terms of costs, while rail infrastructure requires significant investment in construction and maintenance, the operating cost per unit decreases with distance and load. Labor is the largest cost component, comprising up to 60% of operating expenses, followed by locomotives, wagons, fuel, and equipment maintenance (Rodrigue, 2020). However, transshipment and train assembly costs can reduce some of these cost advantages.

Rail also brings various economic and environmental benefits. Historically, rail played a major role in industrial development and territorial expansion, particularly in North America during the 19th and early 20th centuries. It remains one of the most energy-efficient transport modes, consuming about four times less energy per ton-kilometre than road transport. Furthermore, rail contributes significantly to employment through activities such as track installation, vehicle manufacturing, operations, and maintenance. It also has positive additional benefits into related industries like steel and engineering. In terms of safety, rail is considered one of the safest forms of land transportation, ranking just behind aviation (Rodrigue, 2020).

The regulation of rail transport has evolved. In many countries, rail was historically state-controlled and heavily subsidized for strategic economic reasons. However, recent reforms have focused on deregulation and the involvement of private operators to improve competitiveness and service quality (Rodrigue, 2020).

Recently, growing concerns about energy consumption and environmental issues such as air pollution from car emissions (especially carbon monoxide), the greenhouse effect, ozone depletion, acid rain, and road traffic injuries have contributed to renewed interest in rail transport. These factors have driven efforts to develop high-speed rail systems between major cities and densely populated areas. Research shows that railways are among the most environmentally friendly modes of transport. Following the Kyoto Protocol (signed on 10 December 1997), the European Union

committed to reducing carbon monoxide (CO) emissions by 18% by 2022. Comparisons of energy consumption among different transport modes show that passenger cars use 3.5 times more energy, and maritime transport uses twice as much energy as passenger rail. For freight transport, trucks consume 8.7 times more energy than rail. One of the key benefits of rail transport is the use of electrified lines, which do not rely on fossil fuels. For example, in Romania, 33% of the rail network is electrified, yet this portion accounts for 54% of total rail transport. In terms of land use, railways are also more space-efficient, occupying only 0.5% of the country's land compared to 4.5% used by roads (Şimut, 2001, p.123).

2.4 Review on Previous Studies

Research on the link between railway development and economic performance highlights how infrastructure investments can influence productivity and long-term growth. A study by Thananuraksakul (2021) examined the impact of railway development on total factor productivity (TFP) and economic growth in Thailand over the period 1993–2015. The research assessed seven sectors contributing to GDP: real GDP, transportation GDP, non-agriculture GDP, industrial GDP, business activity GDP, construction GDP, and private sector GDP. The findings revealed a complex relationship between railway capital stock and sectoral productivity. Specifically, when railway capital stock growth exceeded 6%, TFP in five out of seven sectors declined. In contrast, when capital stock growth was below 6%, these sectors experienced increased productivity. This suggests that excessive investment in railway development may have diminished or even negative returns on productivity in the short run, particularly in sectors like construction and private sector GDP where TFP remained negative overall. Despite this, the study found directional causality between railway capital stock and long-term economic growth. Increases in railway capital stock and stock per capita were associated with sustained economic performance, supporting theories that infrastructure development fosters long-term gains.

Additionally, other variables in the study also showed positive associations with long-run growth, though the effect of private capital per capita was negligible and slightly negative. Overall, Thananuraksakul (2021) concluded that improving the railway network supports productivity and growth over the long run. The findings reinforce the importance of balanced and well-timed investment in railway

infrastructure to maximize economic benefits.

Kasikoen et al. (2023) examined the effects of inter-urban railway transportation on regional development in Greater Jakarta's suburban areas using a system dynamic modeling approach. Their study revealed that suburban railway expansion improves commuting efficiency, shortens travel time, and boosts regional economic growth by enhancing labor mobility and connectivity between urban and peri-urban zones. However, the research also identified negative consequences, such as accelerated urban sprawl and the loss of agricultural land due to unregulated railway-induced development. These trends pose risks to sustainable development if not addressed through coordinated planning. The study stresses that without robust urban policies and governance, the benefits of railway infrastructure could be undermined by environmental and socio-economic issues like traffic congestion, shrinking green spaces, and socio-spatial disparities. Kasikoen et al. advocate for integrated land-use and transportation planning to align railway development with regional goals, ensuring balanced and sustainable urban expansion in the long term.

Recent studies on urban transportation planning in Thailand emphasize the growing significance of transit-oriented development (TOD) as a strategic framework for managing urban growth, improving land use efficiency, and enhancing public transport accessibility. TOD promotes compact, walkable, and mixed-use communities centered around high-capacity transit nodes, encouraging a shift away from car dependency (Calthorpe, 1993; Curtis et al., 2009).In the case of Thailand, Jarritthai and Techpeeraparnich (2017) conducted a focused TOD case study around Salaya Station on Bangkok’s Red Line. Their research highlights the potential of TOD principles in shaping sustainable and functional station precincts. By assessing the existing urban conditions and stakeholder needs within an 800-meter radius of the station, the authors proposed a land use framework that promotes mixed-use development, active transport, and integrated mobility services.

According to Htet Htet Thaw (2018), transportation is a vital sector of Myanmar's economy, and Yangon faces increasing traffic congestion due to population growth and urbanization. Rail transport, especially the Yangon Circular Railway, is considered a safe, cost-effective, and environmentally friendly mode of transport. The system operates 221 daily trains across 38 stations, serving thousands of passengers. However, aging infrastructure, limited capacity, and outdated facilities reduce service quality and efficiency. Although fare adjustments in 2016 improved passenger volumes

and revenue, issues such as long travel times, lack of comfort, and safety concerns persist. Station facilities are often inadequate, and staffing, ticketing, and passenger services need improvement. The study suggests that modernization of the Circular Railway, including upgraded stations, better communication systems, more locomotives, and staff training, is essential. Upgrading Yangon's railway stations is necessary to meet growing demand and provide efficient public transport in the city (Thaw Htet Htet, 2018).

CHAPTER III
OVERVIEW OF YANGON CIRCULAR RAILWAY SYSTEM

3.1 Historical Development of Railway in Myanmar

On 1 May 1877, the Irrawaddy State Railway began operating the Yangon–Pyay railway line, spanning 161 miles, using A01 steam locomotives, thus inaugurating the very first railway line in Myanmar. In 1896, the Irrawaddy State Railway was leased to the Burma Railway Co., Ltd. to handle railway operations and commercial affairs. After the lease period ended on 31 December 1928, the railway was transferred under the management of the Indian Railway Board. In 1937, following Myanmar's separation from India, the Government of Myanmar established the Burma Railway Board. In 1942, the British Governor transferred the responsibilities and authority of the Burma Railway Board to the Chief Railway Commissioner. After Myanmar gained independence on 4 January 1948, the Financial Commissioner for Lands and Rural Development was appointed as the Chairman of the Railway Board. On 1 December 1951, the Union of Burma Railway Board Act was enacted, officially establishing the Union of Burma Railway, and appointing a full-time Chairman who also served as the Chief Executive Officer. In 1972, it was reorganized as the Burma Railway Corporation, which was administered by a Management Committee under the leadership of a Director General. Following the assumption of state power by the State Law and Order Restoration Council on 18 August 1988, the organization was reconstituted on 1 April 1989 as Myanma Railways. Myanmar's railway operations began 52 years later than Britain and 24 years later than India, and by 2017, it had reached its 140th year of operation. Today, it remains one of the oldest railway systems in Southeast Asia. (Myanma Railways)

From 1889 to 1890, the Yangon–Kyimyindaing–Insein section was constructed as a meter-gauge railway line. Later, in 1901, the Yangon–Pazundaung section was also built as a meter-gauge line. Although there had been a plan to create a circular railway around the city, it could not be implemented at that time. In December 1958, the Yangon Circular Railway project was initiated. The circular railway line was completed on

March 19, 1959, and officially opened for service on May 1, 1959." (Myanmar Railways)

3.2 Development of Yangon Circular Railway System

The first railway in Myanmar began operations on May 1, 1877, with a 161-mile meter-gauge line from Yangon to Pyay. Later, in 1889, the Yangon–Mandalay railway line was completed by connecting four segments: Yangon to Nyaunglebin in 1884, Nyaunglebin to Taungoo in 1885, Taungoo to Yamethin in 1888, and finally Yamethin to Mandalay in 1889. Following the completion of these lines, local train services such as Yangon–Thingangyun–Toegyaunggalay and Yangon–Kyimyindaing–Insein were introduced along the Yangon–Pyay route to serve suburban residents.

Before World War II, there were plans to build a circular railway to connect Yangon city with surrounding suburban areas. However, the war disrupted the region, including Myanmar, and the project was not initiated. After gaining independence, during the Caretaker Government era, General Ne Win revived the circular railway plan. Construction work for the circular line began on December 10, 1958, and was completed on March 19, 1959. The project involved linking two existing main railway lines the Yangon–Pyay and Yangon–Mandalay lines—by connecting Mahlwagon Station (on the Yangon–Mandalay line) with Danyingon Station (on the Yangon–Pyay line) using a double track.

Subsequent expansions included the 5.22-mile Danyingon–Hlawga line, which began in 1997 and was completed in 1998, connecting to the University of Computer Studies. In addition, the Toegyaunggalay–Okkphosu line, measuring 8.81 miles, was built between 1972 and 1973. A further extension from Okkphosu to the Thilawa Deep Sea Port, covering 9.25 miles, was opened in November 2003. In 2006, a 3.9-mile extension to East University was also completed. As a result, the Yangon circular railway network expanded to include Danyingon to the University of Computer Studies in the north, Toegyaunggalay to Thilawa and East University in the south, and up to Dagon University of Economics in Ywathargyi in the east. However, in 2018, train services to the University of Computer Studies were discontinued and replaced by the YBS 78 bus line for commuters. (Htet Htet Thaw, 2018)

The stations covered by the circular trains are as follow: 1. Yangon Central Railway Station 2. Pagoda Road 3. Lanmadaw 4. Pyay Road 5. Shan Road 6. Ahlone

Road 7. Panhlaing Road 8. KyimyinDaing 9. Hantharwaddy 10. Hledan 11. Kamaryut 12. ThiriMyaing 13. Okkyin 14. Thamaing 15. ThamaingMyothit 16. Gyogon 17. Insein 18. Ywama 19. Phawkan 20. Aung San Myo 21. Danyingon 22. Golf course 23. Kyaikkalae, 24. MingalardonBazzar 25. Mingalardon 26. Waibage 27. Okkalapa 28. Paywetseikkon 29. Kyaukyedwin 30. Tantarkalay 31. Yegu 32. Parami 33. Kanbe 34. Baukhtaw 35. Tarmwe 36. Myitanyunt 37. Maglwakone 38. Pazuntaung

Trains depart from Yangon Central Railway Station approximately every 45 to 60 minutes, but they operate at a relatively slow speed. The circular railway line consists of 38 stations, while the suburban line includes 17 stations, 3 of which are shared with the circular line. These stations are categorized into two types: block stations, which are staffed by both a station master and a clerk, and pick-up stations, which are operated only by clerks. There are 17 block stations, including major ones such as Yangon, Kyimyindaing, and Insein, while the remaining 31 stations are pick-up stations.

The circular line follows the natural north–south alignment of the city's geography, forming a long and narrow loop. This alignment allows the line to serve a wide area, covering both inner and outer urban zones. It passes through many townships and links the Central Business District (CBD) with other areas such as Dagon, Ahlone, Kyimyindaing, Sanchaung, Kamayut, Hlaing, Insein, Mingalardon, North Okkalapa, South Okkalapa, Mayangone, Yankin, Tarmwe, Thingangyun, and Mingalar Taungnyunt. While some bus stops are located near the CBD and residential areas, many railway stations are situated farther from central points. For example, Yangon Railway Station, Pagoda Road Station, and Lanmadaw Station lie at the northern edge of the CBD. Likewise, Okkalapa and Paywetseikkon Stations are located at the western edge of North Okkalapa Township, while Kanbe and Baukhtaw Stations are at the western side of South Okkalapa Township.

Certain stations are conveniently located near developed shopping centers, such as Yegu, Hledan, and Pyay Road. However, access roads in areas like Waibargi and Golf Course remain poorly developed, with only narrow paths available. Some stations, including Kyeikkale, Tadagale, Pazundaung, Danyingon, Kyaukyedwin, Pyay Road, Hledan, and Mingaladon, are relatively close to bus routes. In contrast, stations like Mingaladon Bazaar, Waibargi, Yegu, Kanbe, and Baukhtaw are farther from bus connections, making it difficult for passengers to transfer between modes of transport. On the other hand, several stations such as Mingaladon Bazaar, Paywetseikkon, Hledan, and Kanbe are located near local markets, making them convenient for passengers

accessing bazaars. (Htet Htet Thaw, 2018).

On 21 April 2012, commitments of assistance were secured from Japan to support the upgrading of both the Yangon–Mandalay railway line and the Yangon Circular Railway (YCR) line. A feasibility study for the project was undertaken over the course of one year, from January to December 2014.The Yangon Circular Railway section covers a total length of 29.5 miles. The development plan for this project is outlined as follows:

1. Detailed Design Phase: 2014–2015
2. Preliminary Engineering Works: 2015–2016
3. Construction Period: 2017–2026

Figure 3.1 Yangon Circular Railway System

Source: Myanma Railway (YCR upgrading project)

3.3 Yangon Circular Railway Upgrade Project

The development of the Yangon Circular Railway has been supported through multiple financing mechanisms, including both international assistance and national resources. Under the Official Development Assistance (ODA) loan scheme provided by the Japan International Cooperation Agency (JICA), significant investments have been allocated for the modernization of the railway system. These initiatives include the installation of an advanced signaling system and the procurement of eleven Diesel Electric Multiple Unit (DEMU) train sets, comprising a total of sixty-six carriages, with an overall project value of 24,866 million Japanese Yen. Concurrently, projects funded through the national government budget have focused on the execution of urban engineering works along the Yangon Circular Railway Line. These works are being carried out in two phases and encompass various infrastructure improvements aimed at enhancing the operational efficiency and service quality of the railway network. (see in table 3.1). The objectives of upgrading Yangon circular railway station project are as follow;

1. To renovate and upgrade the deteriorating basic railway infrastructure and related facilities,
2. To replace aging systems with new Diesel Electric Multiple Unit (DEMU) train sets to ensure safe and reliable passenger transportation.
3. To establish an advanced railway operation system that meets contemporary standards in terms of the installation of automatic signal lighting and modern communication systems

3.3.1 Operational Efficiency and Service Quality of Railway Network

The operating efficiency and service quality of the Yangon Circular Railway before and after improvements are presented, focusing on two key aspects: travel speed per hour and total travel time, which demonstrate the better performance of the upgraded system

Table 3.1 Operating Efficiency

Sr.No	Yangon Circular Railway	Existing Condition (before)	Improved Condition (after)
1.	Travel Speed per hour	40 km (25 mile)	60 km (37 mile)
2.	Travel Time	2 hr 50 min	1 hr 50 min

Source: Myanma Railway (YCR upgrading project)

As part of the upgrading efforts of railway stations and infrastructure, notable improvements have been observed on the Yangon Circular Railway. Prior to the upgrade, the travel speed was approximately 40 kilometers per hour (25 miles per hour), resulting in a total travel time of 2 hours and 50 minutes for a complete loop.

After the implementation of station and track upgrades, the travel speed increased to 60 kilometers per hour (37 miles per hour), reducing the total travel time to 1 hour and 50 minutes. This improvement reflects enhanced operational efficiency and suggests that the station upgrades, along with related infrastructure improvements, have contributed to faster and more convenient railway services for passengers.

The number and types of trains RBE (Renovated Bogie Engine), PC (Passenger Coaches), and DEMU (Diesel Electric Multiple Unit) are important for the operating efficiency and service quality of the Yangon Circular Railway. Differences in the types and numbers of trains affect the capacity, speed, passenger comfort, and overall reliability of the service.

Table 3.2 Trains on Yangon Circular Railway

Timeline	**RBE**	**PC**	**DEMU**	**Total**
As of June, 2016	34 cars	79 cars	0	113 cars
In 2021	18 cars	41 cars	66 cars	125 cars

Source: (JICA,2016)

The table 3.2 shows the number of railway cars by type RBE (Renovated Buses for Engines), PC (Passenger Coaches), and DEMU (Diesel Electric Multiple Units) in two time periods: as of June 2016, and in 2021. In June 2016, there were a total of 113 cars. Among them, 34 were RBE cars and 79 were passenger coaches. At that time, there were no DEMU cars in service.

By 2021, the total number of cars increased to 125. However, the composition changed significantly. The number of RBE cars decreased from 34 to 18, and passenger coaches also declined from 79 to 41. On the other hand, DEMU cars increased from zero to 66, showing that this type of rolling stock was newly introduced and quickly expanded. This change indicates a shift in focus toward more modern and efficient train systems. The increase in DEMU units suggests efforts to upgrade the railway system and improve the overall quality and performance of train services.

3.3.2 Progress of Railway Infrastructure Works (2020-2026)

The progress of railway infrastructure works includes several key activities aimed at improving the overall safety and efficiency of the railway system. These activities involve the rehabilitation of track structures, laying of 75 lb, 9-meter jointed rails, ballast filling along the tracks, repair of bridges, construction of drainage culverts, upgrading of level crossings, and building of signal and electrical facilities.

Table 3.3 Civil works of Upgrading Railway Trucks

Sr. No	Description of Works	Unit	Quantity	2018	2019	2020
1.	Rehabilitation of railway track structures	Miles	29.5	Completed	Completed	Completed
2.	Laying of 75 lb, 9meter jointed rails	Miles	59	Completed	Completed	Completed
3.	Ballast filling along railway tracks	Cu-yards	31500	Completed	Completed	Completed

4.	Repair of bridges	No.	15	Completed	Completed	Completed
5.	Construction of drainage culverts	feet	72990	Completed	Completed	Completed
6.	Upgrading of level crossing	Locations	25	Completed	Completed	Completed
7.	Construction of signal and electrical buildings	Buildings	13	Completed	Completed	Completed

Source: Myanma Railway (YCR upgrading project)

The table 3.3 presents the key engineering works undertaken from 2018 to 2020 as part of the Yangon Circular Railway (YCR) development project. A total of 29.5 miles of railway track structures were rehabilitated, ensuring improved track stability and safety. Concurrently, 59 miles of 75-pound, 9-meter jointed rails were laid across the designated sections, and 31,500 cubic yards of ballast were filled along the track to enhance durability and drainage. Structural improvements included the repair of 15 railway bridges, reinforcing the safety of train operations. Additionally, 72,990 feet of drainage culverts were constructed to prevent waterlogging and track deterioration. The project also focused on public safety by upgrading 25 level crossings to reduce traffic hazards at rail-road intersections. Moreover, 13 signal and electrical buildings were constructed, aimed at modernizing the train control and communication systems.

The progress of key railway infrastructure development under the Yangon Circular Railway upgrading project includes station reconstruction, platform upgrades, pedestrian bridge construction and repair, as well as the installation of fencing to improve safety and security along the railway line. Various components are at different stages of completion, reflecting ongoing efforts to enhance the overall railway system.

Table 3.4 Civil works of Upgrading infrastructures

Sr. No	Description of Works	Unit	Quantity	2021	2022	2023	2024	2025	2026	Finished	On going	To be continued
1	Reconstruction of stations	no	32				———	———	———	7	5	20
2	Station Platform Upgrading	no	38				———	———		38	0	0
3	Bridges (pedestrian)	no	38	———	———	———	———			21	1	16
4	Repair of bridges (pedestrians)	no	33			———	———			11	0	22
5	Construction of fence	feet	44679	———	———	———	———			31507	0	13172
Note: Completed ——— , Expected -------												

Source: Myanma Railway (YCR upgrading project)

The table 3.4 summarizes the progress of key railway infrastructure development components under the Yangon Circular Railway (YCR) upgrading project from 2020 to 2026. The reconstruction of 32 stations is planned, of which 7 have been completed, 5 are ongoing, and 20 remain to be constructed. Station platform upgrading has achieved full completion, with all 38 platforms upgraded by the reported year. In terms of pedestrian bridge construction, 21 out of 38 planned bridges have been completed, 1 is under construction, and 16 remain. The repair of existing pedestrian bridges stands with 11 out of 33 structures completed and 22 pending. Furthermore, a total of 44,679 feet of fencing is planned to enhance security and safety along the railway line. As of the latest update, 31,507 feet have been completed, with 13,172 feet remaining.

During the 2024–2025 fiscal year, significant progress has been made in railway infrastructure, including station reconstruction, platform modernization, and pedestrian bridge construction and repairs. These works contribute to enhancing the overall functionality and safety of the railway system.

Table 3.5 Civil works of Upgrading Infrastructures (2024-2025 fiscal year)

Sr. No	Description of Works	Unit	Estimated	Finished	Ongoing
1	Reconstruction of stations (Hanthar wady, Kamaryut, Thirimyaing,Okkyin, Themine,Thamine Myo Thit,Phakan,Aung San,Okkalpa,Kyaut Yae Twin,Tadarkalay,Tawme)	no	12	7	5
2	Station Platform Upgrading (excluding Yangon, Panhlaing, Kyi Myint Daing, Hledan, Insein,)	no	33	33	33
3	Bridges (Pedestrian)	no	2	2	0
4	Repair of Bridges (Pedestrians)	no	8	8	0

Source: Myanma Railway (YCR upgrading project)

The table 3.5 presents the civil works being implemented during the 2024–2025 fiscal year include the reconstruction of 12 railway stations such as Hantharwady, Kamaryut, Thirimyaing, Okkyin, Themine, Thamine Myothit, Phakan, Aung San, Okkalpa, Kyaut Yae Twin, Tadarkalay, and Tawme. Out of these, 7 stations have been completed, while the remaining 5 are still under construction. The upgrading of 33 station platforms—excluding Yangon, Panhlaing, Kyi Myint Daing, Hledan, and Insein—has been fully completed. In addition, 2 new pedestrian bridges were constructed, and repair work on 8 existing pedestrian bridges was completed. At present, there is no ongoing work under the pedestrian bridge categories.

3.3.3 Effects of Station Upgrades on Passenger Numbers (2019–2025)

Passenger usage at Kamayut Station on the Yangon Circular Railway has experienced significant fluctuations over recent years. These changes reflect the impact of external factors such as the COVID-19 pandemic, political instability, and ongoing station upgrading efforts, which have influenced the number of passengers and the overall railway service recovery.

Table 3.6 Number of Passengers at Kamayut Station (2019–2025)

Years (From April to March)	Number of Passengers (Yangon Circular Railway)
2019-2020	367300
2020-2021	5230
2021-2022	2010
2022-2023	18900
2023-2024	46790
2024-2025	51410

Source: Kamayut Station, Myanma Railway

The table 3.6 shows that the number of passengers using Kamayut Station on the Yangon Circular Railway has changed significantly from 2019 to 2025 due to various external factors. In the year 2019–2020, before major disruptions, the station recorded a high number of passengers, totaling 367,300. However, in 2020–2021, this figure dropped sharply to only 5,230 passengers due to the combined effects of the COVID-19 pandemic and political instability. The decline continued in 2021–2022, with only 2,010 passengers, mainly due to ongoing political challenges. A slight recovery was seen in 2022–2023, with 18,900 passengers, as station upgrading activities were initiated. Passenger numbers continued to increase in 2023–2024 and 2024–2025, reaching 46,790 and 51,410 respectively, which reflects gradual improvements in the railway services and the completion of some station upgrades.

3.4 Yangon Circular Railway Routes

The Circular Line and Suburban Line operate as separate systems, although some routes overlap. The Circular Line includes both loop and shuttle services, such as the Yangon–Insein and Insein–Yangon shuttle, as well as the Yangon–Mingalardon and Mingalardon–Yangon loop. In contrast, the Suburban Line operates only shuttle services, including the Yangon–Ywathargyi and Ywathargyi–Yangon route, and the Yangon–Toegyaunggalay and Toegyaunggalay–Yangon route. A complete round trip on the Circular Line takes approximately three hours, with an average stopping time of about 20 seconds at each station.

Ticket fare calculation is based on the rates of per person-mile. The ticket fares for the Yangon Circular Railway differ based on the type of train and travel distance. For trains operated with a Rail Bus Engine (RBE) locomotive, the fare is 400 kyats for a one-way trip up to 15 miles, and 800 kyats for a complete one-round trip covering more than 15 miles. Diesel Electric Multiple Unit (DEMU) trains charge 500 kyats for a one-way journey and 1,000 kyats for a full one-round trip. However, DEMU services are currently limited and do not serve stations within Hlaing Township. These trains operate only on the anticlockwise route from Insein Station to Yangon Central Station.

3.5 Railway Stations in Hlaing Township

In Hlaing Township, there are three key railway stations Kamayut, Thiri Myaing, and Okkyin located along Baho Road, which runs parallel to Yangon Bus Service (YBS) routes 11, 94, and 21. To enhance passenger accessibility and improve overall convenience, the platforms at all three stations have been raised by approximately three feet. This elevation helps facilitate easier boarding and alighting from trains, especially for elderly passengers, children, and those with mobility challenges. Along with these platform upgrades, significant reconstruction work has been carried out on the drainage systems and railway tracks at each station. These improvements are aimed at enhancing the durability and safety of the infrastructure, reducing the risk of flooding during heavy rains, and ensuring smoother train operations.

For pedestrian safety, overpasses have been constructed at Kamayut and Thiri Myaing stations. These pedestrian bridges allow passengers and local residents to cross over the railway tracks safely without disrupting train movements or risking accidents.

In contrast, Okkyin Station did not require a new pedestrian overpass since it already has a designated pedestrian crossing point where a road intersects with the railway, allowing safe and controlled access for pedestrians.

All three stations have also been upgraded to include improved toilet facilities, which provide better hygiene and comfort for passengers. Each station now features one toilet unit that is specifically designed to be accessible for persons with disabilities, ensuring inclusivity and equal access. Additionally, there are three separate toilet units each for male and female passengers, helping to accommodate the needs of a larger number of commuters.

To support commercial activity and enhance the convenience of passengers, two rental shop units have been constructed at each station. These shops offer opportunities for small businesses to operate within the station premises, providing goods and services that benefit daily commuters. Furthermore, a dedicated room has been included at each station to serve as a rest area for railway staff and as a space to welcome special guests or conduct official functions. This room contributes to better staff welfare and facilitates smoother station management.

Overall, these comprehensive improvements at Kamayut, Thiri Myaing, and Okkyin stations reflect ongoing efforts to modernize the Yangon Circular Railway, improve passenger experience, and ensure safe, efficient railway operations in Hlaing Township.

CHAPTER IV
SURVEY ANALYSIS

4.1 Survey Profile

This study assesses the impact of railway station upgrades in Hlaing Township, Yangon. In this urban area, railway stations function as essential public transport hubs that support the daily mobility needs of a diverse population including workers, students, and residents from low- and middle-income households. As the city continues to urbanize and expand, the improvement of station facilities is seen as a necessary step toward ensuring efficient, safe, and accessible public transportation. The primary objective of the study is to evaluate how these infrastructure upgrades have affected passenger experiences and local public service quality.

The dependent variable in this study is the overall satisfaction of train passengers with the current services and facilities available at the upgraded stations. Service-related variables include the cleanliness and maintenance of station environments, perceived safety and comfort, ease and efficiency of ticketing systems, clarity and availability of information displays, punctuality and reliability of train schedules, and the physical condition of trains and platforms. In addition, passenger demographic characteristics such as age, gender, education level, and township of residence are collected to better understand the profile of train users. Travel patterns, including frequency of train usage, primary purpose of travel (e.g., commuting to work or school), and station most frequently used, are also considered as influencing factors.

To gain a more comprehensive understanding of the station's service performance, the study also incorporates the perspectives of station staff. Staff members are asked to evaluate how the upgraded facilities, systems, and equipment support their day-to-day operational responsibilities and their ability to deliver quality services to passengers.

Two separate but complementary sets of questionnaires were designed one for passengers and another for station staff. Passenger questionnaires focus on satisfaction levels across different dimensions of service quality and station functionality, while staff questionnaires assess the adequacy of work environments and system support following the upgrades. Primary data were collected during a peak hour period at key railway stations in Hlaing Township.

4.2 Survey Design

This study collected primary data through a survey of train passengers, while secondary data was obtained from railway authorities, official websites, reports, and related journals. The primary focus of the analysis is passenger satisfaction with the services and facilities at the upgraded railway stations in Hlaing Township.

According to Taro Yamane's (1973) formula, the estimated sample size was 110 respondents from a population of 180 with a 5.5% margin of error and a 95% confidence level. In the end, 110 respondents who answered the survey were included in the study. This slight difference between the calculated and actual sample sizes arose due to practical challenges during data collection, such as non-responses or incomplete answers. The data on service quality and passenger experience was gathered through face-to-face interviews using a convenience sampling method among train passengers, including students, workers, office staff, and local residents who regularly use the stations. The survey was conducted at June 2025, covering both weekdays and weekends, using a combination of online and manual survey forms to capture a wide range of commuter experiences.

The formula used to determine the sample size is:

$$n = \frac{N}{1 + N(e^2)}$$

Where:

- n = the sample size,
- N = the population size (180),
- e = the acceptable sampling error (assumed to be 5.5% at a 95% confidence level).

Applying the values into the equation:

$$n = \frac{180}{1 + 180(0.055^2)} = 116.5 \approx 110$$

The survey questionnaire consists of multiple sections, covering different aspects of passenger satisfaction. It includes questions about demographic characteristics, travel patterns, and satisfaction with various service components such as station cleanliness, safety, ticketing process, information availability, train punctuality, and platform conditions.

A total of 100 passengers and 10 station staffs are participated in the survey. Respondents rated their level of agreement with each statement using a Five-Point Likert Scale, where 1 represents "strongly disagree," 2 "disagree," 3 "neutral," 4 "agree," and 5 "strongly agree." The collected data was analyzed using descriptive statistics, frequency distributions, graphs, reliability testing, and correlation analysis to understand passenger satisfaction levels and identify key service factors influencing their experience.

The questionnaire was divided into four main sections, designed to address the study objectives related to the Yangon Circular Railway System's development. Basic information from both passengers and station staff, such as age, gender, occupation, residence, and travel frequency (for passengers) or work experience and role (for staff) are collected. This helps analyze the socio-economic background of the community and staff involved in railway operations.

Passengers are asked about their satisfaction with station facilities and services, including cleanliness, safety, ticketing convenience, information availability, and accessibility. Station staff provide feedback on how well the upgraded infrastructure supports their daily work and service delivery. This helps evaluate the current state of railway infrastructure and its effects on both users and employees. Passengers answer questions about their experience during train travel, covering punctuality, cleanliness, comfort, safety, and staff behavior on board. Station staff may also comment on operational challenges related to train services. This identifies opportunities to improve service quality through infrastructure development.

Both passengers and staffs are invited to share their views on challenges faced and suggestions for further improvements. Passengers may comment on how railway development affects their daily lives and community access, while staff provide insights into operational challenges and future needs. Respondents rate their satisfaction using a Five-Point Likert Scale, ranging from strongly disagree to strongly agree. The data collected will be analyzed to understand socio-economic impacts, assess infrastructure

development, and identify opportunities and challenges in the Yangon Circular Railway System.

4.3 Survey Results

4.3.1 Demographic Profiles of Respondents

This section provides an overview of the demographic profiles and travel behavior of the respondents who participated in the survey for the assessment of railway station upgrades in Yangon. The data includes key characteristics such as gender, age group, and occupation, which help to identify the diversity of the respondents. Information on the purpose of travel, frequency of railway use, and trip type offers insight into commuter behavior and needs. Additionally, respondents were asked about their main reasons for choosing railway transportation, as well as their primary sources of information regarding train schedules and ticketing. The survey also identified the specific station most frequently used by each respondent Kamayut, Thiri Myaing, or Okkyin. Understanding these demographic and behavioral patterns is essential for evaluating public opinion on station infrastructure and for informing future improvements that address the real needs of Yangon's railway users.

Table 4.1 Demographic Profiles of Respondents

No	Name	Particular	Frequency
1	Gender	Male	48
		Female	52
Total			100
2	Age	Under 18	2
		18–30	16
		31–45	52
		46–60	20
		Above 60	10
Total			100
3	Occupation	Student	17
		Government Staff	23
		Private Sector Employee	36
		Self-employed	15
		Retired	9
Total			100
4	Purpose of travel	Commuting	43
		Education	11
		Shopping	10
		Tourism	4
		Visiting	32
Total			100
5	Main reason for choosing railway transportation for this trip	cost-effectivness	17
		convenient	38
		near by station	16
		comfort	19
		punctuality	6
		other	12
Total			100

No	Name	Particular	Frequency
6	Frequency of Use	Daily	48
		2–3 times/week	23
		Weekly	16
		Occasionally	10
		First time	3
Total			100
7	Trip Type	One-way	58
		Round-trip	42
Total			100
8	How do you get information about the train schedule and ticketing?	From station staff	62
		Applications (example-YRS)	11
		Website of Myanma Railway	1
		Social media	20
		Other	6
Total			100
9	Which station do you most frequently use?	Kamayut	38
		ThiriMyaing	30
		Okkyin	32
Total			100

Source: Survey Data (June, 2025)

Table 4.1 illustrates the survey collected responses from 100 railway users. Among them, 48 were male and 52 were female. In terms of age, the majority (52 respondents) were between 31 and 45 years old. This was followed by 20 respondents aged 46 to 60, 16 aged 18 to 30, 10 above 60, and 2 respondents under the age of 18. Regarding occupation, 36 respondents were employed in the private sector, 23 were government staff, 17 were students, 15 were self-employed, and 9 were retired. The main purpose of travel for most respondents was commuting, which accounted for 43 individuals. Other purposes included visiting (32), education (11), shopping (10), and tourism (4).

When asked about the main reason for choosing railway transportation, 38 respondents stated convenience, followed by comfort (19), cost-effectiveness (17), proximity to the station (16), punctuality (6), and other reasons (12). In terms of how often they used the railway, 48 respondents used it daily, 23 used it two to three times a week, 16 used it weekly, 10 used it occasionally, and 3 were first-time users. For trip

type, 58 were traveling one-way, while 42 were on round trips. Most respondents got information about train schedules and tickets from station staff (62). Others received information through social media (20), mobile applications like YRS (11), other sources (6), or the Myanma Railways website (1). The stations most frequently used were Kamayut by 38 respondents, Okkyin by 32, and Thirimyaing by 30.

The findings suggest that a significant portion of railway users are working-age adults commuting for work and personal activities. Convenience, comfort, and proximity are key factors influencing railway use, indicating that upgrades should prioritize improved facilities, accessibility, and efficient service. Additionally, since many passengers rely on station staff for information, enhancing digital communication tools and signage could further support community engagement and traveler satisfaction. Upgrading stations like Kamayut, Okkyin, and Thiri Myaing is particularly relevant, given their high usage, and could contribute positively to local economic and social development.

4.3.2 Satisfaction Experience at Kamayut Station

Survey results from Kamayut Railway Station show that recent upgrades have greatly improved passenger satisfaction and contributed to local community development. Passengers particularly appreciated improvements in environmental cleanliness, noting that the station and its surroundings are now cleaner and more hygienic. Upgrades such as better lighting have enhanced safety during early morning and evening travel, while additional seating has provided greater comfort for waiting passengers. These improvements have created a safer, more convenient, and pleasant environment for commuters.

Beyond improving travel conditions, the upgrades have also had a positive impact on the surrounding community. Enhanced accessibility and modern facilities have strengthened the station’s role as a key transport hub, encouraging economic activity and benefiting local businesses. These developments demonstrate how infrastructure improvements can not only improve passenger experience but also bring broader social and economic benefits to the area.

Table 4.2 Passengers Satisfaction with Experience at Kamayut Station

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Punctuality	0	2	11	20	3	3.67	0.72
2	Ticket price	0	4	17	12	3	3.39	0.8
3	Ticketing and schedule information	0	4	13	16	3	3.5	0.81
4	Improvements (contributed to a cleaner environment)	0	2	4	21	9	4.03	0.77
5	Seating availability at waiting area	0	4	12	17	3	3.53	0.81
6	Comfort and ventilation	0	2	11	21	2	3.64	0.68
7	Lighting Condition	0	2	10	22	2	3.67	0.68
8	Do upgrades benefit your community?	0	2	5	15	14	4.14	0.87
9	Satisfaction on overall experience	0	3	14	15	4	3.56	0.81
	Overall Mean						3.68	0.77

Source: Survey Data (June, 2025)

According to table (4.2), the survey findings from Kamayut Railway Station show that recent upgrades have generally improved passenger satisfaction and contributed positively to community development. The overall mean satisfaction score of 3.68 indicates moderately high user satisfaction.

High ratings for environmental cleanliness (mean = 4.03) and perceptions of community development benefits (mean = 4.14) suggest that infrastructure improvements are seen as beneficial beyond the station itself, enhancing the surrounding area and quality of life. Positive scores for station comfort, lighting, and seating further reflect the value of physical upgrades in improving passenger experience. Lower scores related to ticket price fairness (mean = 3.39) and neutral views on some services indicate that affordability and information accessibility remain areas for improvement.

Overall, the data suggest that station upgrades at Kamayut have positively influenced both service quality and community development, though targeted efforts in specific service aspects could further enhance user satisfaction and maximize social impact.

4.3.3 Satisfaction Experience at Thiri Myaing Station

This section examines passenger experiences at Thiri Myaing station. It looks at how users perceive station facilities, cleanliness, safety, accessibility, and overall satisfaction. Understanding these experiences helps identify strengths and weaknesses in the current station conditions. Information about waiting areas, toilets, signage, and ticketing shows how well the stations meet commuter needs. By analyzing this information, the study aims to find areas that need improvement and support the development of better, more accessible, and user-friendly railway stations in Yangon.

Table 4.3 Passengers Satisfaction with Experience at Thiri Myaing Station

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Punctuality	0	3	7	17	1	3.57	0.74
2	Ticket price	0	4	17	5	2	3.18	0.77
3	Ticketing and schedule information	0	3	12	12	1	3.39	0.74
4	Improvements (contributed to a cleaner environment)	0	1	4	19	4	3.93	0.66
5	Seating availability at waiting area	0	3	18	6	1	3.18	0.67
6	Comfort and ventilation	0	2	13	11	2	3.46	0.74
7	Lighting Condition	0	2	8	16	2	3.64	0.73
8	Do upgrades benefit your community?	0	0	4	15	9	4.18	0.67
9	Satisfaction on overall experience	0	2	16	9	1	3.32	0.67
	Overall Mean						3.54	0.71

Source: Survey Data (June, 2025)

According to table 4.3, the survey results from Thiri Myaing Station indicate generally positive perceptions of the station's services and the recent upgrades. The overall mean satisfaction score across all indicators is 3.54, reflecting moderate to high satisfaction among respondents.Among specific aspects, the highest mean score (4.18) was recorded for agreement that the station upgrades have positively contributed to community development, suggesting a strong perceived link between infrastructure improvements and local socio-economic benefits. Additionally, environmental improvements (mean = 3.93) and lighting conditions (mean = 3.64) were rated favorably, highlighting the role of physical upgrades in enhancing user experience and community environment.

Areas such as ticket price fairness (mean = 3.18) and seating availability (mean = 3.18) showed relatively lower satisfaction levels, indicating room for further improvement in affordability and passenger comfort.Overall, the data suggests that the upgrades to Thiri Myaing Station have had a positive impact on both passenger satisfaction and perceptions of community development, though certain operational and service aspects still require attention to maximize benefits.

4.3.4 Satisfaction Experience at Okkyin Station

This section focuses on passenger experiences at Okkyin Station. It explores how users view the station's facilities, cleanliness, safety, accessibility, and overall satisfaction. Gaining insight into these experiences allows for identifying the strengths and areas needing improvement within the station's current condition. Details about the waiting areas, restrooms, signage, and ticketing processes reveal how effectively the station serves its commuters. By examining this information, the study seeks to highlight necessary improvements and contribute to making railway stations in Yangon more efficient, accessible, and comfortable for all users.

Table 4.4 Passengers Satisfaction with Experience at Okkyin Station

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Punctuality	0	4	7	18	2	3.58	0.81
2	Ticket price	0	5	17	5	4	3.26	0.89
3	Ticketing and schedule information	1	5	13	12	0	3.16	0.82
4	Improvements (contributed to a cleaner environment)	1	4	9	14	3	3.45	0.96
5	Seating availability at waiting area	1	7	14	7	2	3.06	0.93
6	Comfort and ventilation	1	4	15	11	0	3.16	0.78
7	Lighting Condition	1	3	9	16	2	3.48	0.89
8	Do upgrades benefit your community?	0	0	5	15	11	4.19	0.7
9	Satisfaction on overall experience	0	2	20	7	2	3.29	0.69
	Overall Mean						3.40	0.83

Source: Survey Data (June, 2025)

According to (Table 4.4), the satisfaction survey at Okkyin Station shows moderate overall satisfaction among passengers, with an overall mean score of 3.40. Respondents were most positive about the contribution of station upgrades to community development, with a high mean score of 4.19, suggesting that users recognize the broader social benefits of infrastructure improvements. Punctuality of train services also received relatively high satisfaction (mean = 3.58), while lighting conditions (mean = 3.48) and perceptions of a cleaner environment (mean = 3.45) further reflect the positive impact of the upgrades on the station's physical environment and service reliability.

Areas such as ticket price fairness (mean = 3.26), availability of information (mean = 3.16), and seating availability (mean = 3.06) were rated lower, indicating that operational and service-related improvements are still needed to enhance the overall passenger experience. Overall, the findings suggest that the upgrades at Okkyin Station are contributing positively to community development and certain aspects of service quality, though targeted efforts in affordability and facility services could further improve user satisfaction and maximize community benefits.

Passenger respondents at the railway station reveals both appreciation for recent upgrades and significant expectations for further improvements to enhance service quality, comfort, and community development. While prior survey data indicated moderate to high satisfaction levels (e.g., overall mean scores of 3.40–3.68 at different stations), qualitative feedback identifies key gaps that, if addressed, could substantially improve passenger experience and the station's role in urban life.

Many passengers suggested additional facilities such as roofing over platforms, more seating, and cleaner, comfortable waiting areas. These improvements are essential for passenger comfort and inclusivity, particularly benefiting elderly and vulnerable users, and align with broader goals of equitable public infrastructure. Concerns about safety including requests for security guards, CCTV, fire alarms, and safer platform crossings reflect the importance of security for building public trust in railway services. A safe station environment contributes not only to individual well-being but also to community stability and sustainable urban development. Cleanliness emerged as a major issue, with complaints about littering, dirty platforms, and insufficient waste management. Addressing hygiene standards is critical for public health and maintaining the station's image as a valued community asset.

Passengers also called for digital improvements, such as real-time train schedules, online ticketing, contactless payments, and Wi-Fi. These upgrades support modern, efficient service delivery and contribute to smart city initiatives, making public transport more accessible and attractive. Frequent complaints about limited train services, delays, and crowded conditions underscore the need for improved operational efficiency and capacity. Reliable, punctual train services are vital for economic participation and for supporting sustainable urban mobility.

Overall, the survey highlights that while recent upgrades have been beneficial, further improvements in infrastructure, cleanliness, safety, and digital services are necessary. Addressing these issues would not only enhance passenger satisfaction but also strengthen the station's role as a catalyst for community development and urban sustainability.

4.3.5 Passenger Satisfaction on onboard Train for all stations (kamayut, Thiri Myaing and Okkyin)

The onboard passenger survey reveals moderate satisfaction, reflecting both strengths and weaknesses in service quality. Passengers reported positive experiences with basic conditions like lighting and ventilation, indicating acceptable levels of comfort. However, seating comfort and window cleanliness need improvement to enhance convenience and visibility. More notably, respondents expressed dissatisfaction with train cleanliness and onboard safety, raising concerns about health, security, and overall passenger trust. Furthermore, limited time for boarding and alighting was seen as inconvenient, particularly for vulnerable groups such as the elderly and those with mobility challenges. To achieve better public transport and community development outcomes, improvements in cleanliness, safety, comfort, and operational efficiency are crucial for creating a more inclusive and reliable rail service.

Table 4.5 Passenger Satisfaction on onboard Train for all stations (Kamayut, Thiri Myaing and Okkyin)

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Seat Availability and Comfort	0	19	48	31	3	3.18	0.77
2	Cleanliness inside the train	6	57	27	7	4	2.47	0.87
3	Security and Safety on board	3	32	53	12	1	2.76	0.74
4	Window cleanliness and visibility	3	20	44	29	5	3.13	0.89
5	Adequate Lighting inside the train	1	16	39	42	3	3.3	0.81
6	Stop time at each station	6	34	46	12	3	2.72	0.86
7	Ventilation and air flow	2	18	40	36	5	3.24	0.87
	Overall Mean						2.97	0.83

Source: Survey Data (June, 2025)

According to (Table 4.5), the onboard passenger survey reveals moderate levels of satisfaction, with an overall mean score of 2.97. This indicates that while some aspects of the train experience are acceptable, there remain significant areas requiring improvement to align with broader goals of enhancing public transport and supporting community development.

Among the assessed indicators, adequate lighting (mean = 3.30) and ventilation and airflow (mean = 3.24) received the most positive feedback, reflecting reasonable satisfaction with basic onboard conditions. However, seat availability and comfort (mean = 3.18) and window cleanliness (mean = 3.13) also suggest room for improvement in terms of passenger comfort and visibility. In contrast, cleanliness inside the train (mean = 2.47) and security and safety onboard (mean = 2.76) were rated poorly, with more than half of respondents expressing dissatisfaction with train hygiene and onboard safety. These issues directly impact public health, passenger trust, and the perceived reliability of rail services.

Similarly, stop time at each station (mean = 2.72) received low ratings, indicating that passengers may feel rushed or inconvenienced during boarding and alighting. This can particularly affect the elderly, disabled, or those traveling with children, undermining the accessibility and inclusiveness of public transport.Overall, the findings suggest that to fully realize the benefits of station upgrades for community development, attention must also be paid to the quality of onboard services. Enhancing cleanliness, comfort, safety, and operational timing on trains is essential to improve the overall travel experience, increase ridership, and support a sustainable, equitable urban mobility system.

4.3.6 Station Staff Satisfaction on Experiences at All Stations (Kamayut, Thiri Myaing, Okkyin)

Station staff satisfaction with their experiences at the station is an important aspect of service quality and operational efficiency. Several factors contribute to this satisfaction, including station infrastructure, toilet facilities, cleanliness and sanitation, lighting and visibility, service systems, and perceptions of passenger satisfaction. Additional elements such as ticketing processes, clarity of signage, seating availability, and safety measures also play a significant role. These factors together determine how effectively the station environment supports staff performance and enhances the overall quality of services provided to passengers.

Table 4.6 Station Staff Satisfaction with Experiences at All Stations (Kamayut, Thiri Myaing, Okkyin)

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Infrastructure (Building/Platform)	0	0	0	8	2	4.2	0.42
2	Toilet Facilities	0	0	0	9	1	4.1	0.32
3	Ticketing system functionality and efficiency	0	0	7	3	0	3.3	0.48
4	Station cleanliness and sanitation	0	0	1	8	1	4.0	0.47
5	Lighting and visibility at station	0	0	1	9	0	3.9	0.32
6	Availability and condition of seating area	0	1	3	6	0	3.5	0.71
7	Signage and information clarity	0	0	6	4	0	3.4	0.52
8	Safety features and emergency preparedness	0	1	7	2	0	3.1	0.57
9	Station’s facilities and systems for serving passengers	0	0	1	9	0	3.9	0.32
10	Passenger satisfaction with station facilities	0	0	2	8	0	3.8	0.42
	Overall Mean						3.72	0.46

Source: Survey Data (June, 2025)

Respondents from station staff highlights a generally positive assessment of current station conditions and services, according to (Table 4.6), with an overall mean score of 3.72. This survey was conducted among 10 staff members working at different railway stations. This suggests that recent upgrades have led to noticeable improvements in infrastructure, cleanliness, and passenger service delivery, contributing to the station's development role in the community. Key areas receiving high ratings include station infrastructure (mean = 4.2), toilet facilities (mean = 4.1), and cleanliness and sanitation (mean = 4.0). These findings indicate that physical improvements at the station have been effective in enhancing the work environment and service standards, aligning with public expectations for modern and hygienic facilities.

Staff also reported satisfaction with lighting and visibility (mean = 3.9) and overall service systems (mean = 3.9), reflecting adequate conditions that support safe and efficient passenger flow. Furthermore, perceptions of passenger satisfaction (mean = 3.8) suggest that station upgrades have had a visible impact on user experience. Moderate scores were observed for the ticketing system (mean = 3.3), signage and information clarity (mean = 3.4), and seating availability (mean = 3.5). These indicate opportunities for further enhancement, particularly in areas that affect efficiency, comfort, and navigability important for creating inclusive and user-friendly public spaces.

The lowest rating was for safety features and emergency preparedness (mean = 3.1), signaling a need for targeted improvements in risk management infrastructure. Strengthening emergency systems would not only improve staff confidence and readiness but also enhance public safety, a critical component of sustainable community infrastructure. Overall, station staff feedback supports the view that infrastructure upgrades have positively influenced service delivery and environmental conditions. Continued investment in technical systems, safety, and passenger support features will be essential to deepen the station's role as a key asset for community development and inclusive urban mobility.

4.3.7 Overall Mean Scores at All Stations (Kamayut, Thiri Myaing, Okkyin)

Assessing satisfaction among passengers and staff helps to understand the quality of railway services at different locations. Passenger satisfaction varies by station, with some stations rated higher than others. Overall, passengers tend to be more satisfied with the station facilities than with the onboard train services. In contrast, station staff generally have a more positive view of their working environment than passengers do. These differences highlight important areas to focus on for improving both station and onboard experiences.

Table 4.7 Overall Mean Scores at All Stations (Kamayut, Thiri Myaing, Okkyin)

Sr.No	**Overall Mean on Station Experience by Passengers**
1	3.68 (Kamayut)
2	3.54 (Thiri Myaing)
3	3.40 (Okkyin)
Sr.No	**Overall Mean on Onboard Train by Passengers**
1	2.97 (For all Stations: Kamayut,Thiri Myaing ,Okkyin)
Sr.No	**Overall Mean on Station Experience by Station Staffs**
1	3.72 (For all Stations: Kamayut,Thiri Myaing ,Okkyin)

Source: Survey Data (June, 2025)

Among the three stations, Kamayut received the highest overall mean score of 3.68, indicating that passengers experienced relatively better conditions there. Thiri Myaing followed with a score of 3.54, while Okkyin had the lowest score at 3.40. These figures suggest that passenger satisfaction with station experience varies by location. In contrast, the overall mean score for onboard train experience across all stations was 2.97, which is lower than the station scores. This indicates that passengers were generally less satisfied with the onboard services. Meanwhile, station staff across all three stations rated their station experience slightly higher, with an overall mean of 3.72, suggesting a more positive perception compared to that of the passengers.

CHAPTER V
CONCLUSION

5.1 Findings

The survey results indicate that recent station upgrades have positively influenced the overall satisfaction of both station staff and passengers, reflecting improvements in service quality and contributing to community development goals. Station staff reported high levels of satisfaction with key infrastructure elements such as the station buildings, platform conditions, toilet facilities, cleanliness, and lighting, with mean satisfaction scores above 4.0 in these areas. This suggests that physical improvements at the stations are well recognized by staff who work there daily. However, staff expressed moderate satisfaction with ticketing system functionality and emergency preparedness, indicating room for improvement in operational efficiency and safety measures.

Passenger feedback on onboard train conditions showed mixed results. While seating availability and ventilation received moderate satisfaction ratings, concerns about cleanliness, security, and stop times at stations were evident, with mean scores below 3.0. These findings point to gaps in the quality of the travel experience that need to be addressed alongside station upgrades to ensure a comprehensive improvement in service delivery.

Additionally, both passengers and staff highlighted important areas for further enhancement. Suggestions included adding more seating and shelter on platforms, improving safety through CCTV and security personnel, and upgrading digital information systems such as real-time train schedules and online ticketing. Cleanliness, both on platforms and inside trains, was repeatedly emphasized as a critical factor for user satisfaction and public health. These improvements would not only enhance passenger comfort and safety but also support broader goals of sustainable and inclusive community development by making rail transport more reliable, accessible, and user-friendly.

Overall, the data suggests that while the physical upgrading of stations has been largely successful and appreciated, continuous efforts are needed to improve service

efficiency, safety, and passenger experience onboard trains. Addressing these factors holistically can strengthen the role of railway stations as key nodes for urban mobility and drivers of economic and social development within their communities.

5.2 Suggestions

To improve the overall experience, it is important to upgrade the ticketing system by making it more efficient and user-friendly. Introducing online ticketing and contactless payment options, along with real-time digital schedule displays, will help passengers plan their trips better and reduce confusion. Increasing the frequency of cleaning both on trains and at stations, including waiting areas and toilets, will ensure a cleaner and healthier environment. Proper waste management and controlling vendors can further support hygiene standards.

Enhancing safety is also essential. Installing more CCTV cameras, emergency alarms, and employing security personnel will help passengers feel safer. Improving platform safety by providing safer crossing options such as pedestrian bridges or ramps will reduce accidents. Providing more covered seating and benches on platforms will protect passengers from weather conditions and reduce fatigue while waiting. Improving ventilation and lighting inside trains and waiting areas will increase passenger comfort.

Increasing the frequency of trains and ensuring they run on schedule will make the service more reliable. Longer stop times at stations will help passengers board and leave trains more comfortably during busy hours. Lastly, developing station spaces to include convenience stores, snack shops, and green areas can turn stations into social and commercial centers, benefiting both the community and the local economy. Implementing these improvements will not only meet passenger and staff needs better but also contribute positively to community development and sustainable urban mobility.

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APPENDIX - I

QUESTIONNAIRES

Circular Railway Passenger Satisfaction Survey

Section A: General Information

1. Gender: ☐ Male ☐ Female
2. Age Group: ☐ Under 18 ☐ 18–30 ☐ 31–45 ☐ 46–60 ☐ Above 60
3. Occupation: ☐ Student ☐ Government Staff ☐ Private Sector Employee ☐ Self-employed ☐ Retired ☐ Other: _____
4. Please indicate your place of residence:
   Ward: _____ Township: _____
5. Purpose of Travel Today: ☐ Commuting ☐ Education ☐ Shopping ☐ Tourism ☐ Visiting ☐ Other: _____
6. What is your main reason for choosing railway transportation for this trip?
   ☐ Cost-effectiveness ☐ Proximity of the station (near your location)
   ☐ Convenience ☐ Comfort ☐ Punctuality ☐ Other (please specify): _____
7. Frequency of Use:

   ☐ Daily ☐ 2–3 times/week ☐ Weekly ☐ Occasionally ☐ First time

8. Trip Type: ☐ One-way ☐ Round-trip
9. Typical Trip Duration: ☐ <30 mins ☐ 30–60 mins ☐ 1–2 hrs ☐ >2 hrs
10. How do you get information about the train schedule and ticketing?

    ☐ YRS Application ☐ From station staff ☐ Website of Myanma Railways ☐ Others (please specify): _____

Please rate the following aspects of your experience using the **5-point scale** below:

1 – Very Dissatisfied | 2 – Dissatisfied | 3 – Neutral | 4 – Satisfied | 5 – Very Satisfied

Section A: Railway Station Experience

No.	Station Aspect	1	2	3	4	5
1	Punctuality of train arrival and departure	☐	☐	☐	☐	☐
2	Ticket price fairness	☐	☐	☐	☐	☐
3	Availability of ticketing and schedule information	☐	☐	☐	☐	☐
4	The improvements at the station have contributed to a cleaner environment around the area	☐	☐	☐	☐	☐
5	Seating availability in waiting areas	☐	☐	☐	☐	☐
6	Comfort and ventilation in the station	☐	☐	☐	☐	☐
7	Lighting Condition	☐	☐	☐	☐	☐
8	Do you agree that the recent upgrades to this railway station have positively contributed to the development of your community?	☐	☐	☐	☐	☐
9	I am satisfied with my overall experience at this railway station.	☐	☐	☐	☐	☐

Section B: Onboard Train Experience

No.	Train Aspect	1	2	3	4	5
1	Seat availability and comfort	☐	☐	☐	☐	☐
2	Cleanliness inside the train	☐	☐	☐	☐	☐
3	Security and safety onboard	☐	☐	☐	☐	☐
4	Window cleanliness and visibility	☐	☐	☐	☐	☐
5	Adequate lighting inside the train	☐	☐	☐	☐	☐
6	Stop time at each station is sufficient	☐	☐	☐	☐	☐
7	Ventilation and air flow	☐	☐	☐	☐	☐

Section C: Additional Feedback (Optional)

1. Are there any additional improvements or facilities you would suggest for enhancing the passenger experience at this station?

2. Do you have any complaints or concerns about this railway station? If yes, please describe them below:

Railway Staff Survey on Station Upgrading

Section A: General Information

1. Gender: ☐ Male ☐ Female
2. Age Group: ☐ Under 25 ☐ 25–35 ☐ 36–50 ☐ Above 50
3. Years of Service:
   ☐ 1–5 years ☐ 6–10 years ☐ More than 10 years
4. Station Name: _____
5. What is your position/job title at the railway station?

   _____

Section B: Station Conditions

Please rate the following aspects using the scale below:

1 – Very Poor 2 – Poor 3 – Average 4 – Good 5 – Excellent

No.	Station Aspect	1	2	3	4	5
1	Station infrastructure (building/platform)	☐	☐	☐	☐	☐
2	Toilet facilities (cleanliness, availability)	☐	☐	☐	☐	☐
3	Ticketing system functionality and efficiency	☐	☐	☐	☐	☐
4	Station cleanliness and sanitation	☐	☐	☐	☐	☐
5	Lighting and visibility in the station	☐	☐	☐	☐	☐
6	Availability and condition of seating areas	☐	☐	☐	☐	☐
7	Signage and passenger information clarity	☐	☐	☐	☐	☐
8	Safety features and emergency preparedness	☐	☐	☐	☐	☐

No.	Station Aspect	1	2	3	4	5
9	How would you describe the station's facilities and systems for serving passengers?	☐	☐	☐	☐	☐
10	How satisfied do passengers seem with the current services and facilities at the station?	☐	☐	☐	☐	☐

Section C: Additional Comments

- What challenges or issues still remain at the station?

- Suggestions for further improvement:

* Thank you very much for your participation. *