YANGON UNIVERSITY OF ECONOMICS
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PUBLIC BUS TRANSPORTATION IN YANGON CITY

(A CASE STUDY OF PASSENGERS' SATISFACTION ON YANGON BUS SERVICES (YBS)

KHIN SANDI KYAW

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PUBLIC BUS TRANSPORTATION IN YANGON CITY (A CASE STUDY OF PASSENGERS' SATISFACTION ON YANGON BUS SERVICES (YBS))

A Thesis submitted in partial fulfillment of the requirements for
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This is to certify that this thesis entitled "**Public Bus Transportation in Yangon City (A Case Study of Passengers' Satisfaction on Yangon Bus Services (YBS))"** submitted as the requirement for the Degree of Master of Economics has been accepted by the Board of Examiners.

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ABSTRACT

This study emphasizes public bus transportation, especially Yangon Bus Services (YBS). The objective of the study is to examine the passengers' satisfaction with bus travelers and to explore the relationship between overall satisfaction and five variables. In this study, 160 respondents from Yangon University of Economics in the Western District were surveyed using snowball methods. Passenger satisfaction is measured on a Five-Point-Likert-Scale using quantitative data analysis. Overall satisfaction of bus passengers among five factors (bus stop, bus drivers, buses, payment system, and bus routes) is mostly neutral. Overall satisfaction and five factors related to public bus transportation are positively correlated and statistically significant, according to the correlation analysis's findings. Yangon Bus Service (YBS) authorities should address the needs of the YBS system and work to improve the quality and maintenance of the buses in order to make it a better bus system. This study was compiled with the aim of making an improved bus system in the future.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BMTA	Bangkok Mass Transit Authority
BRT	Bus Rapid Transit
CBD	Central Business District
CNG	Compressed Natural Gas
CSO	Central Statistical Organization
DHSHD	Development of Human Settlements and Housing
GDP	Gross Domestic Product
GYCT	Golden Yangon City Transportation Co. Ltd
MRT	Mass Rapid Transit
PDR	People's Democratic Republic
PHV	Private Hire Vehicles
RHT	Right-Hand Traffic
RTC	Road Transport Corporation
SLORC	State Law and Order Restoration Council
VCSBE	Vientiane Capital State Bus Enterprise
YBPC	Bus Public Company Co. Ltd
YBS	Yangon Bus Services
YCDC	Yangon City Development Committee
YDBCC	Yangon Division Bus Control Committee
YPS	Yangon Payment System
YRG	Yangon Regional Government
YRTA	Yangon Region Yangon Region Transport Authority
YRTC	Yangon Region Private Transportation Committee
YUE	Yangon University of Economics
YUPT	Yangon Urban Public Transportation Co. Ltd

CHAPTER I
INTRODUCTION

1.1 Rationale of the Study

All of the countries in the world have transportation services. Transportation development has an influence on economic development. Transportation in urban areas is highly complex because of the modes involved, the multitude of origins and designations, and the amount and variety of traffic.

Transportation is significant because it facilitates trade, commerce, and communication, all of which are necessary for civilization to thrive. Traffic flows are managed by good planning, which allows for uninterrupted and steady movement from one location to another. Public transportation provides people with mobility and access to employment, community resources, medical care, and recreational opportunities in communities.

Public transport systems involve all transport systems, such as people do not have their own vehicles. These terms are generally taken to include public bus services, railway services, waterway services, pick-ups (modified pick-up trucks with seating in the covered back half), ferries, taxi services, motorcycle taxis (where the passenger rides pillion), and cycle rickshaws, which are the most common modes of transportation in Yangon.

Public transportation supports fuel efficiency and reduces air pollution to gain economic benefit by improving communities' health and also improving road congestion and providing an equitable transportation system. But it will have so many problems for those taking public transportation. The current metro area population of Yangon in 2021 was 5,422,000, including the new satellite townships. The area of Yangon (Metro) is 10,170 km2. The original city limits of Yangon, with 27 townships, covered 134 sq. miles. The city now extends over 352 sq. miles with 33 townships.

The primary issue is traffic congestion. Public transportation that is efficient, dependable, and economical is essential to our quality of life. In fact, traffic congestion in Yangon is at an all-time high. Today, public transportation is the most popular mode of transportation in the city. The present public transportation system in Yangon has

grown insufficient, and it is unable to move people effectively. It's also possible that the current public transportation system is constrained by the existing restricted road infrastructure, the poor physical state of roadways, and traffic congestion.

Yangon Bus Service (YBS) is a bus transport network system that started operations on January 16, 2017, serving Myanmar's former capital city of Yangon. When the YBS system was first implemented, people had difficulties with the change of bus lines, but later it was found that they could travel comfortably. Passengers were satisfied with the good layout of the bus, the standard of service and the cheap fares. In addition, the buses started running with new cars, the interior and exterior of the buses were clean, and the air conditioning system was good. Changing the YBS system has a lot of impact on people's travel.

Yangon Bus Services (YBS) services operate for 20 organizations under the YRTC in 2021. Yangon Bus Services (YBS) has 140 bus lines and a total number of buses is 5,735. In the western district, most bus travelers use Yangon Bus Services (YBS). Bus travelers use them for work and school daily. However, the quality of the buses may have decreased due to daily use since the start of the YBS conversion, and they have some depreciation for running the service. Thus, bus travelers' satisfaction on YBS has been decreasing day after day. So, the aim of this study is to explore travelers' satisfaction with YBS service in Yangon City.

1.2 Objectives of the Study

The objectives are to identify the current public transportation system in Yangon City, to examine passengers' satisfaction with Yangon Bus Services (YBS) in Yangon City's Western District, and to explore the relationship between overall bus passenger satisfaction and five relevant factors.

1.3 Method of Study

It used a descriptive method based on primary and secondary data. Face-to-face interviews (surveys) with a well-structured questionnaire were used to collect primary data. A sample of 160 respondents was collected at Yangon University of Economics (YUE) and used the snowball method for the survey. According to the snowball method, one bus rider in YUE was asked about the YBS system, the number of other riders was checked from these riders, and the questions were distributed according to the number of bus riders. All questions were asked using this method. This survey

measures traveler satisfaction on a five-point Likert scale using quantitative data analysis. The secondary data is collected by the Yangon Region Private Transportation Committee (YRTC), CSO, journals, and research papers concerning public transportation in Yangon City.

1.4 Scope and Limitation of the Study

The scope of the study is Yangon Bus Services (YBS) in Yangon City for 140 bus lines and organized by 20 companies. This study focused on the bus traveler's satisfaction with public bus transportation (YBS), especially at Yangon University of Economics in the Western District. The survey is conducted with a questionnaire about travelers' satisfaction with YBS services, and it will be collected from 160 respondents from Yangon University of Economics. This study period is between July and August 2022.

1.5 Organization of the Study

This study is divided into five chapters. Chapter one is an introduction to the rationale of the study, objective, method, scope, and organization of the study. Chapter two deals with a literature review. Chapter three is the study on road transportation in Yangon City. Chapter four is a study on survey analysis. Finally, chapter five is a conclusion which compiles findings and suggestions.

CHAPTER II
LITERATURE REVIEWS

2.1 The Characteristic of Public Bus Transportation

Public transportation, also referred to as public transportation, public transit, mass transit, or simply transit, is a mode of group travel that is open to the general public, unlike private transportation, which is typically scheduled, operated on established routes, and charges a posted fee for each trip. The majority of public transportation systems follow fixed routes with predetermined embarkation locations and operate according to a specified schedule, with the most frequent services operating at a headway.

Bus services use buses on regular routes to transport many passengers on shorter journeys. Buses can run on regular roads, have a lower traffic volume than trams or trains, and have relatively inexpensive bus stops to support people. Buses are the primary mode of public transport in use today. The bi-articulated bus, articulated bus, regular bus, and minibus are among the bus types that are in use around the world. Buses are so widely used in urban areas as shuttle services to supplement other forms of bus transportation. International differences in the use and scope of public transportation arise due to geographic, historical, and economic factors.

Regular buses, bus rapid transit (BRT), light rail, subways, ferries, etc. are all forms of urban public transportation. Personal motorized vehicles, bicycles, and foot travel are all examples of personal transportation. Walking, using public transportation, and driving were the original characteristics of today's urban areas. In most cities, there are various amounts of material. The types and distributions of buses used in metropolitan areas to provide fundamental needs so vary widely. The two worldwide oil crises of 1973 and 1979 resulted in high costs and limited supplies of fossil fuels, which encouraged the growth of public transportation systems. Urban public transportation, which is a crucial component of the urban passenger transportation system, has contributed to the sustainable growth of cities and urban transport by easing traffic congestion, lowering the need for fossil fuels and environmental pollution, and ensuring that urban residents can access cities. (Gao, Y.; Zhu, J, 2022)

Since the old period, road transportation has been needed. In particular, in modern times, the mobility of people and goods has grown to become one of the most important necessities that must be appropriately provided in our society and economy. (Raoniar, Rao & Senathipathi, 2015). As a result, the economy as a whole will stagnate without a transportation management system. Between producers, suppliers, industrial users, and commuters on their own, transportation helps to bridge the gap. Transport systems offer a key to discovering and managing many other networks at multiple scales (Beirao, 2007). Transportation is a process that involves moving passengers, commodities, and services from one starting point to another (Okoko, 2006). Communication between developed and developing countries is made possible by transportation. All forms of transportation that are accessible to the general public, regardless of ownership, are considered public transit (White, 2002). Common forms of public transportation include buses, minibuses, shared taxis, modified pick-up trucks, motor scooters (auto rickshaws), and pedal rickshaws (Adesanya, 2011; Muhammed, 2015).

Urban public transit differs distinctly among countries. In developing nations, road-based public transportation predominates. One of the variables influencing a city's structure and socioeconomic development is its public transportation system, which is the backbone of urban life (Santhakumar, 2003). The significance of public transportation can be attributed to its ability to supply transportation for those who cannot afford a car, as well as its contribution to the development and upkeep of livable communities by reducing traffic on the roads and ensuring long-term sustainability in terms of resource use and environmental impact (Nurul-Habib, Kattan & Islaam, 2009). By impacting the size, shape, and pace of cities as well as trade, availability of people and resources, and scale economies, transportation has a significant role in determining the appearance of both urban and rural areas (Banjo, 2008). (Owoeye, A. S., Yakubu-Wokili, H. U., Jatau, S. U., ONI, B. G., & Jatau, N. (2022))

The demand for mobility has increased as a result of the population growth. If the infrastructure for public transportation cannot keep up with demand, this could result in longer wait times and more traffic on the roads and in public transportation. The best way to achieve a reliable transportation system in any nation is to have a thorough understanding of the system's dynamics (Ogbazi, 1992). Although it is believed that reliability, comfort, and journey duration have a significant impact on customer satisfaction in relation to the type of trip, the majority of transportation

companies do not take these factors seriously (Raoniar, Rao, & Senathipathi, 2004)). (Owoeye, A. S., Yakubu-Wokili, H. U., Jatau, S. U., ONI, B. G., & Jatau, N. (2022))

One of the key problems that metropolitan public transportation networks currently face is the movement of people and goods. Public transportation use has decreased recently in certain wealthy cities. According to a variety of sources, the development is a result of more individuals working at home, ride-sharing services becoming more popular, and the low cost of automobile loans in many nations. Private automobiles are the main risk to public transportation among all kinds of transportation. If the use of public transport increases as a result, there will be some functional characteristics where it can be implemented or improved and maintained.

2.2 The Problem of Public Bus Transportation in Urban Area

The development of the automobile industry, urbanization, and economic expansion have all contributed to a substantial shift in urban mobility worldwide towards using public transportation. Today, a significant portion of people's regular activities involve private transportation. The main challenge facing cities around the world is finding a way to balance the relationship between people's increasing demand for private motorization and the development of urbanization, modernization, and motorization as well as the significant economic, social, and environmental costs. (Y. Gao and J. Zhu, 2022)

Urban transportation has been extremely convenient, but it has also created some very big problems for the urban environments in which it occurs. "The motor vehicle has been implicated in much that negatively affects our environment," says traffic in towns (Buchanan, 1963). Great Cities and Their Traffic by Michael Thomson, written in 1977, offers a helpful description of the reasons why most people are unsatisfied with their cities' transportation systems. The following are the seven problems of urban transport, interrelated with each other: (1) Traffic Movement and Congestion (2) Public Transportation Crowding (3) Off-peak Public Transportation Inadequacy (4) Pedestrian Difficulties (5) Parking Difficulties (6) Environmental Impact (7) Atmospheric Pollution. (Raghv, 2010)

Traffic Movement and Congestion: When the volume of movements that use urban transportation networks can no longer be managed, traffic congestion results. Congested places are located according to patterns of urban land use, physical transportation infrastructure, and activities that generate trips in those locations. The

levels of traffic congestion change over time, with a very distinct peak during the daily commute to work periods. Although overcrowding is the primary cause of most congestion, there are other facets of this fundamental problem that also need to be solved. Motor vehicle movements are challenging in complex areas, and long-term parking is nearly impossible. Uncontrolled use of motorized and other vehicles is one of the factors causing congestion in cities in developing nations. Since 1950, there has been a significant increase in private car ownership and use in western cities, but there has rarely been a corresponding expansion of the road system. This trend is likely to continue into the twenty-first century, further aggravating the problem. (Raghv, 2010)

Public Transport Crowding: At such peak times, the "human congestion" that develops within public transportation vehicles adds salt to injury, sometimes literally. The majority of daily trips are made during rush hours, which are marked by long waits at stations, packed terminals, stairwells, and ticket counters, as well as overly long stretches of hot and stuffy transit in crammed-in vehicles. The "overcrowding" that occurs in public transport vehicles at such peak times sometimes leads to injuries. Most of the daily journeys are long, so the stations, gates, bus lines, and ticket counters are crowded and cause tariff congestion. Bus users all over the world are facing dire situations with public transportation crowding in rush hours. It is an unbelievably difficult situation, especially in big cities in some developing countries. (Raghv, 2010)

Off-peak Inadequacy of public transportation: The basis of the urban transportation issue for public transportation providers is this inequality in automobile use. In order to provide peak-hour service, many now have to maintain enough trucks, equipment, and labor, which is a highly inefficient use of resources. Reducing off-peak services is frequently the only way to reduce costs, yet doing so drives away remaining customers and promotes increased car use. However, companies in underdeveloped nations are not troubled by this "off-peak problem." There, the metropolitan population is expanding quickly, and few people own cars, so there is enough off-peak traffic to support high vehicle occupancy rates throughout the day. (Raghv, 2010)

Difficulties for Pedestrians: Most of the victims in traffic accidents are pedestrians. Most of the time, their efforts to improve safety have focused on reducing pedestrian traffic rather than addressing the root of the problem, which is high traffic volume and speed. Additionally, there are roadblocks caused by parked automobiles and an increase in urban pollution, with individuals on foot being most directly affected by traffic noise and exhaust fumes. (Raghv, 2010)

Parking Difficulties: In city traffic, most vehicles are parked on the sides of major roads rather than trying to find a parking spot. Finding a place to park is like finding money to buy a car. Therefore, the problem of parking is one of the problems of urban transportation. Road congestion slows down public transport and makes it difficult to travel in a straight line. Providing adequate parking space for urban workers and shoppers or within central business districts (CBDs) has major implications for land use planning. The proliferation of multi-story car parks is only a partial solution, with additional on-street parking often leading to road congestion. (Raghv, 2010)

Environmental Impact: The use of automobiles contributes to pollution. Society is only starting to appreciate the devastating and dangerous effects of motor vehicle use. Traffic congestion is a significant problem in many parts of the city, and trying to deal with rising traffic congestion has other negative environmental impacts. Traffic noise is widely recognized as a major environmental problem that causes traffic congestion in urban areas. Walking and other activities in urban areas can be distracting, and more importantly, traffic noise can seep into buildings. (Raghv, 2010)

Atmospheric Pollution: Auto exhaust emissions are one of the worst costs for urban dwellers with many vehicles. This issue is important as the car is only one of many sources of air pollution, and prolonged exposure to air pollution can harm health. Traffic fumes from poorly maintained diesel engines can be very unpleasant to drive in urban areas, especially if Engine fumes affect all urban roads, and they almost certainly help create smog. However, when traffic increases, so will air pollution. According to ecologists, the sudden increase in the number of cars on our roads, occurring without serious restrictions, is quickly turning into a disaster for the environment. The main way cars cause air pollution is through their exhaust gases. There are many impacts from traffic in the metropolitan area. However, it should be noted that what is considered an environmental problem is often determined by personal preferences. (Raghav, 2010)

Some problems with the bus system and with unofficial bus services are the following: Services are generally of low quality, with unsafe boarding, lengthy waits and travel times, erratic scheduling, and uncomfortable accommodations for guests. Poor planning leads to inadequate route design. The lack of sufficient income restricts the ability to maintain and improve the vehicle fleet and services. Competition is limited by bus operators'-controlled entry. Bus drivers are motivated to drive recklessly and in a race for passengers as a result of incentives to maximize fare earnings. Some people

who can afford it choose to buy vehicles because of the poor quality of the bus services. Although it makes them more comfortable, the congestion it causes lowers the quality of bus services.

Rush hour traffic is an inevitable result of the way modern societies operate. A country's transportation system is inevitably shaped by the desires of many people who want to achieve specific goals. Despite efforts to reduce them, traffic jams persist. Regular commuters are becoming frustrated with policymakers' unwillingness to address the issue, which has become a public policy crisis. Governments will not completely eliminate rush hour traffic on the roads. The biggest problem is traffic. Reliable, affordable public transport is essential to our quality of life.

2.3 Public Bus Transportation in Some Selected Countries

Large cities in Asia face particular transportation issues. Urban transportation issues cannot be fully solved by traffic management alone; instead, guided transit systems that are distinct from ground transportation must be implemented. Some of the most recent steps taken to address urban transportation issues in Asia, including financial resources. Traffic congestion and air pollution are getting worse year after year as a result of the increased motorization in several Asian developing nations' major cities. The issues are so severe that they are impairing social and economic operations, and citizens must immediately enhance their city's transportation infrastructure. (M. Sugawara, 2001)

There are numerous vehicles operating for public use in different cities that range in size from buses to taxis. Bicycles and motorcycles are also prevalent. However, guided transit systems are few and far between, and even when they are, they are not fully utilized for urban mobility. Some nations have implemented a variety of traffic management techniques to address the issue of surface congestion. For urban transportation in Asia, Japan has offered cooperation, including various forms of economic and technical cooperation. Service continuity is one of the most crucial needs for transportation. The only controls the bus driver uses when traveling along the fast portion are the accelerator and brakes. This kind of bus is exceptional since it quickly transports passengers between cities without requiring them to change modes of transportation at bus terminals. (M. Sugawara, 2001)

2.3.1 Public Bus Transportation in Laos

The capital city of Lao PDR, Vientiane, has served as the nation's administrative center since 1560. Lao PDR has a land area of 236.8 thousand kilometers and is located between latitudes 14.1 and 22.3. In 2013, there were roughly 6.6 million people living there, making for Southeast Asia's lowest population density of 26 people per km^2. The annual population growth rate was 2.2% on average.

Buses are the primary mode of public transportation in Laos for long distance travel since there is no train system there other than the extremely brief cross-border train from Tha Naleng station in Vientiane to Nong Khai in Thailand. All provinces are served by the bus network. However, it is not very dense. The government-owned public bus route from Vientiane With a few peripheral cities like Vang Vieng, Xiengkhuang, Thakaek, Savannakhet, or Pakse, the Capital primarily serves the capital's outer regions. Many private firms that provide VIP buses have buses that appear newer, are more comfortable, have better service, and depart more frequently. They offer buses that connect Luang Prabang and Pakse, two major hubs, with Vientiane's bus stations. Regular local buses connect neighboring neighborhoods and border towns with these bus hubs. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

The city bus is the primary means of transportation offered by the public transit system in Vientiane. However, compared to other forms of transportation, bus service levels in the city are still below average. The Vientiane Capital State Bus Enterprise (VCSBE) provides twelve minibuses, three electric buses, and eleven bus routes. The JICA sponsored 42 buses that had air conditioning in 2012. Bus usage significantly rose following the introduction of the buses. However, in order to meet the city's people's transportation needs, more buses are required, and roads must be renovated in order to reduce unlawful parking and provide nicer streets, which will help boost the reliability and safety of bus operations. Buses leave from the Central Bus Station every 15 to 60 minutes and travel to a variety of locations inside the city limits. Typically, the buses run from 6 a.m. until 6 p.m. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

In Laos, right-handed traffic (RHT) is common. With financing from the Japanese government, Laos built a new motorway in 2007 that runs from Savannakhet to the Vietnamese border at Lao Bao. In Laos, this has significantly improved transportation. In contrast to 2002, when the trip took more than nine hours, this

roadway may now be traveled in a few hours. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

2.3.2 Public Bus Transportation in Thailand

The Kingdom of Thailand is a Southeast Asian nation located at the center of the Indochina Peninsula. To the north, Burma and Laos; to the east, Laos and Cambodia; to the south, the Gulf of Thailand and Malaysia; and to the west, the Andaman Sea and the southernmost tip of Burma. Bangkok is Thailand's capital, with a population of about 15 million people and a land area of about 7,760 km^2. The Bangkok Metro project cost $149.39 billion USD, or 44.2 percent of the country's GDP. Bangkok is also the world's fifteenth most populous city. The rest of the country is not as lucky as the metropolis, which is experiencing an economic and cultural boom. Lack of equal opportunity and income inequality have persisted. (Wikipedia, 2018)

Thailand has a variety of modes of transportation; none are particularly prevalent. The majority of long-distance travel is done by bus. Although plans are in the works to expand services with high-speed rail lines reaching many important regions of Thailand, low-speed rail travel has long been a rural long-distance transportation method. The main mode of moving freight throughout the nation is by road. Motorbikes are frequently used for short journeys. Public motorcycle taxis are available in Pattaya, Bangkok, and other major cities. Bangkok also has an extremely large number of taxis. The Skytrain is the best mode of transportation in Bangkok since it is quick, convenient, and user-friendly for tourists. Buses are also widely available in the city, but they are subject to the city's infamous traffic congestion. Taxis are reasonably priced, although traffic is a common problem. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

Buses are the most commonly used kind of long-distance transportation and are a primary method of transporting people, cargo, and small packages. Long-distance buses in the tour and VIP classes typically have opulent interiors, whereas buses in the city and lower classes frequently have vibrant paint jobs and advertisements. Almost anywhere in Thailand may be reached by bus because of Thailand's large transportation system. Buses are the most commonly used form of transportation in Thailand. There are many mini-van manufacturers as well. All-important cities are not served by the train, only the four main points. (Wikipedia, 2018)

All around the city and its surrounding regions, the Bangkok Mass Transit Authority provides bus and vehicle services. Several private businesses operate on many bus routes in Bangkok, often duplicating those run by the BMTA. BMTA now runs bus lines across Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakhon, and Nakhon Pathom in Bangkok and the surrounding metropolitan area. Local and city buses in Bangkok are available in a range of shapes, sizes, and costs, including half-size, full-size, double-length, open-window, fan, and air-conditioned vehicles. Bangkok's bus rapid transit system is known as the BRT. Only one of the five routes that were initially intended has been in operation since 2010. There are twelve stations along the 16 km (9.9 mi) route that provide self-development and self-access to the right side of the buses. At Chong Nonsi (S3) and Talat Phlu, both stations have BTS Skytrain connections to the Silom Line (S10). All of the vehicles used were Sunlong vehicles. Five baht is the flat rate. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

2.3.3 Public Bus Transportation in Singapore

The Kingdom of Thailand is a Southeast Asian nation located at the center of the Indochina Peninsula. To the north, Burma and Laos; to the east, Laos and Cambodia; to the south, the Gulf of Thailand and Malaysia; and to the west, the Andaman Sea and the southernmost tip of Burma. Bangkok is Thailand's capital, with a population of about 15 million people and a land area of about 7,760 km^2. The Bangkok Metro project cost $149.39 billion USD, or 44.2 percent of the country's GDP. Bangkok is also the world's fifteenth most populous city. The rest of the country is not as lucky as the metropolis, which is experiencing an economic and cultural boom. Lack of equal opportunity and income inequality have persisted. (Wikipedia, 2018)

Singapore is populated by 5.4 million people and has a land area of roughly 710 km2. Additionally, it has a high population density, with 7.6 thousand people per square kilometer. Transporting more people and commodities around the nation will be necessary due to Singapore's economy. The majority of Singapore's transportation is on land.

Based on five factors: availability, affordability, efficiency, convenience, and sustainability, Urban McKinsey's Transportation report (2018) ranked Singapore's transportation system as the best in the world overall. According to a survey by the London consulting firm Credo, Singapore also has one of the most economical public

transportation systems in the entire globe. With the development of driverless cars, Singapore has become one of the top destinations for major firms in the automotive industry to test and develop autonomous vehicles. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

As of 2019, over 4.0 million rides per day on average were taken on Singapore's buses, making up a sizeable portion of the country's public transportation system. SBS Transit, SMRT Buses, Tower Transit Singapore, and Go-Ahead Singapore run more than 365 regular bus routes. Additionally, there are about 5,800 vehicles now in use, most of which are single-deck and double-deck buses, with a small number of articulated buses. In accordance with its Bus Contracting Model, the Land Transport Authority has been in charge of regulating public bus service standards since 2016 and has acquired the necessary assets. Taxis and private hire vehicles (PHV) are a common mode of transportation, and the prices are thought to be reasonable when compared to those in most developed-nation cities. Initial prices ranged from $3.20 to $3.90. The number of taxis and private hire vehicles has climbed to 83,037 as of March 2019. While private rental cars can be reserved through ridesharing applications, taxis can be waved down at any time of day along any public route outside of the Central Business District (CBD). As of 2018, there were a total of 957,006 motor vehicles in Singapore, with 509,302 of these being private cars. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

2.3.4 Public Bus Transportation in Malaysia

The Kingdom of Thailand is a Southeast Asian nation located at the center of the Indochina Peninsula. To the north, Burma and Laos; to the east, Laos and Cambodia; to the south, the Gulf of Thailand and Malaysia; and to the west, the Andaman Sea and the southernmost tip of Burma. Bangkok is Thailand's capital, with a population of about 15 million people and a land area of about 7,760 km^2. The Bangkok Metro project cost $149.39 billion USD, or 44.2 percent of the country's GDP. Bangkok is also the world's fifteenth most populous city. The rest of the country is not as lucky as the metropolis, which is experiencing an economic and cultural boom. Lack of equal opportunity and income inequality have persisted. (Wikipedia, 2018)

Under British colonial authority, Malaysia's transportation system began to grow, and it is now a diversified and sophisticated system. With a total length of 290,099.38 kilometers, including 2,016.05 kilometers of expressways, Malaysia has a sizable road

system (in 2021). Over 800 kilometers of the nation's primary roadway connect Singapore to the Thai border. East Malaysia's road system is not as well-developed as Peninsular Malaysia's huge road network. In Peninsular Malaysia, the primary forms of transportation include buses, railways, vehicles, motorbikes, and to a lesser extent, commercial air travel. (Wikipedia, 2022)

The main mode of transportation in Kuala Lumpur is the well-connected road network, with Kuala Lumpur as Malaysia's capital having an extensive road network reaching the rest of Peninsular Malaysia. RapidKL is the Klang Valley's and Kuala Lumpur's major public transit provider. Rapid KL has completely redrawn the city's bus network since taking over from Intrakota Komposit Sdn Bhd in order to boost ridership and enhance the city's public transportation system. In order to improve connectivity and reduce the need for additional buses, RapidKL management has implemented a center system. RapidKL also runs the Ampang Line and Kelana 100: Current Status of Public Transportation in ASEAN Megacities, Jaya Line, two rail lines that RapidKL also runs in Kuala Lumpur and the Klang Valley. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

The main modes of transportation in Peninsular Malaysia are buses, railways, cars, including motorbikes (especially in Perlis and Kedah), and to some extent, economic flights. Outside of the city or even internationally, one must be aware of the basics of public transit. In general, Malaysia's transportation systems can be divided into two categories: rail-based and bus-based. The bus Rapid-KL is white and blue. Passenger payments for Rapid-KL buses are made by putting cash in a tiny box next to the driver's pack.

The Malaysian government provides a free bus service called Go-KL. This Go-KL bus is solely for passengers. The best method for getting a general overview of Kuala Lumpur is to take the Hop On/Hop Off Bus. The cost of the KL Hop-On Hop-Off bus ranges generally from RM 15 to RM 140. Rapid KL, Metrobus, as well as a few other smaller operators, operate a vast bus network. The existing bus system is run by 13 major companies, plus a few smaller ones that operate outside of urban regions. Rapid transit and commuter rail are widely used in cities because they ease traffic congestion on other systems and are seen as reliable, comfortable, and safe. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

2.3.5 Public Bus Transportation in Philippines

The Philippines is an island nation in Southeast Asia located in the western Pacific Ocean. Its official name is the Republic of the Philippines. The land area of the Philippines is roughly 300,000 km2. As of a July 2014 estimate, there are 107,668,231 people living in the nation. English is a second official language, with Filipino serving as the major one. The peso is the national currency. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

Transportation in the Philippines refers to the various modes of transportation within this country of more than 7,500 islands. The Philippine government has been enhancing transportation from a previously underdeveloped state through a variety of direct infrastructure initiatives, including a rise in air, sea, road, and rail transportation as well as transport hubs. The types of public transportation in Manila are mass transit, buses, jeepneys, flabs, FXs, or Asian Utility Vehicles, tricycles, pedicabs, and taxis. In 2014, Metro Manila was home to over 30% of all buses operating in the Philippines. A large number of the buses on the roads are used buses that were imported from Japan and have to be converted from right-hand drive to left-hand drive. In Metro Manila, diesel fuel is used in 90% of the buses. (Changhwan MO, Young-in KWON, Sangjun PARK, 2014)

Popular and recognizable public utility vehicles are jeepneys. They now serve as a representation of Philippine culture. Motorized tricycles are another prominent form of public transportation in the nation, especially in more rural and small-town settings. The four rail lines in the Philippines are Line 1 of the Manila Light Rail Transit System; Lines 2 and 3 of the Manila Metro Rail Transit System; and the PNR Metro Commuter Line, which is run by Philippine National Railways. In metropolitan regions, taxis and buses are also significant forms of public transportation. In the Philippines, jeepneys are the most widely used form of public transportation. They are now a widely recognized representation of Filipino culture. (Wikipedia, 2022)

2.4 Contribution of Public Bus Transportation to Well-being of the Community

Public transportation is very important for every country in the world. Public transportation, often known as mass transportation, is a word used to define any transportation system designed for group travel rather than individual travel by private vehicle. Since our population is increasing and we also need to slow down global

warming, public transportation has become more and more crucial. As a result, public transportation will continue to grow in importance. However, there are a few issues with mass transit as well.

The advantages of public transportation include: (1) efficient transportation method (2) fewer greenhouse gas emissions (3) less air pollution (4) less smog (5) less expensive than driving (6) the ability to avoid traffic jams (7) less public health problems (8) more opportunities to meet new people (9) no maintenance on your part (10) less negative externalities from cars (11) less fuel consumption. (Andreas, 2022)

One benefit of using public transportation is that it allows a very efficient method of transportation, allowing a large number of passengers to go in each vehicle. It is significantly more efficient than cars since it emits fewer emissions per passenger. In terms of cost, public transportation is also preferable because it is less expensive to transport many people in a single vehicle than it is for each person to use their own car. When compared to cars, public transportation emits a lot of fewer greenhouse gases. We should make every effort to reduce greenhouse emissions because they will soon become a significant issue due to global warming. (Andreas, 2022)

People can slow global warming by using public transportation. In large cities, air pollution is frequently a severe issue. Large numbers of automobiles and motorcycles are utilized to move people from place to place, particularly in China and the US. However, using cars that are mostly powered by fossil fuels results in a considerable amount of air pollution. During rush hour, cities all over the world have a lot of smog. Many cities are enveloped in pollution as a result of the massive emissions emitted during trips to and from work. So, using public transit instead of an automobile is a wise decision to help reduce the smog issue. Public transportation will be significantly less expensive for every individual compared to owning a private car if you take into account not only the expenses for gasoline but also the costs for repairs, maintenance, and so on. Depending on the area, taking public transportation may also be quicker than driving, especially during rush hour because major cities frequently experience heavy traffic. (Andreas, 2022)

The air pollution that is suggested by the use of cars may negatively affect human health in important ways. Significant air pollution increases our risk of pulmonary and cardiovascular ailments, which may drastically reduce our overall life expectancy. In addition, driving to work frequently results in high levels of stress for many people since they are frequently trapped in traffic. Since stress is known to play

a significant role in health issues, this could worsen their current state of health. Therefore, by avoiding driving and switching to public transportation, good health may be able to maintain and reduce risk of developing major health problems in the future.

There is a good likelihood that you may interact with many people over time if travel by bus or rail. Thus, by taking public transportation rather than driving automobile, might also have the opportunity to meet others. Using public transportation instead of car also saves you from having to deal with any maintenance issues. Instead of worrying about maintenance or other problems, can just take public transportation whenever need it.

In addition to private costs, there are major social costs associated with car use. Therefore, people can greatly reduce the negative externalities that are placed on the broader population by choosing public transportation over driving. By increasing air quality and reducing oil consumption, as well as through better land use rules, public transportation contributes to a healthier environment. It also aids in the expansion of business and employment prospects and provides an equitable transportation system. (Andreas, 2022)

Urban mobility makes it easier to access various resources and opportunities, which significantly improves people's quality of life. In actuality, it is vital to the creation and maintenance of social institutions and influences the features of daily mobility. (Cass, Shove, and Urry, 2005; Kaufmann, 2002; Manderscheid, 2009; Ohnmacht, Maksim, and Bergman, 2009). Mobility is not an issue of free personal choice and may be constrained by very severe structural factors (Massot and Orfeuil, 2005; Wenglenski and Orfeuil, 2006). It would be naive to believe that mobility applies equally to all social classes. The simple reason that modern cultures demand faster transportation and movement does not imply that everyone has access to it (Kaufmann, 2002; Urry, 2007). In short, mobility is not equitably distributed: some people have more transport possibilities than others, and some can travel much faster than others and in more directions. (Diego Hernández, 2017).

Public transportation is as much an issue of social policy as other more traditional social policy topics, such as health and education, because accessibility of commodities, services, and opportunities is essential to people's well-being. Due to the decreased demand, affordability is somewhat less dependent on an individual's performance in the job market. Three key factors must be considered while examining public transportation: (i) level of coverage, (ii) affordability of the service, and (iii) the

existence of specific mechanisms of financial decommodification. These three factors are standpoints of wellbeing and equity in the delivery of a social benefit. (Diego Hernández, 2017)

Studies on mobility, accessibility, and poverty have revealed a number of factors that either make access easier or more difficult (Cass, Shove, and Urry, 2005; Church, Frost, and Sullivan, 2000; Flamm, Jemelin, and Kaufmann, 2008; Titheridge, 2006; Urry, 2007). Focusing on public transport, these can be summarized in the following dimensions: (i) Transport opportunities: the size of the road system, the size of the public transportation system, travel times, the features of public transportation, the quality of rolling stock and static facilities in terms of convenience and safety, and the information provided to passengers. (ii) Institutional configuration: the extent to which the government is involved in establishing transportation options and determining who pays and benefits from travel expenses. Another concern is the preference given to private modes of transportation over public modes, as well as the cost of driving, the structure of public transportation fares, and the availability of mechanisms for control and subsidies. (iii) Individual characteristics: the extent to which people can benefit from transportation options, as well as their position within the institutional structure. People's income, time availability, organizational skills, knowledge of the system, and physical ability to use transportation are all factors to be taken into account in this regard. (iv) Urban form: People's income, time availability, organizational skills, knowledge of the system, and physical ability to use transportation are all factors to be taken into account in this regard. (Diego Hernández, 2017)

There are two primary components to that cost: "required" travel and "voluntary" trips related to the choice between better and worse forms of transportation. The cost borne by families provides information about the affordability of public transportation for households as well as the many ways in which those expenses are allocated to users and socioeconomic levels. The second step is to determine whether things "compete" with transportation costs, or how much of a household's spending is allocated to necessities that are mostly non-replaceable and how much is allocated to items that are likely to have little impact on wellbeing if consumption were to cease. (Diego Hernández, 2017)

Through better land-use regulations, less oil use, and improved air quality, public transportation helps to create a healthier environment. Additionally, it aids in the expansion of employment and commercial prospects. Additionally, it is essential in

emergency situations necessitating a quick and safe evacuation. Public transportation will become more and more crucial in the future if we want to fight global warming and safeguard the environment from all forms of pollution. In order to save the world and ensure that people can live in the future, public transportation will consequently play a significant part in transportation in the future.

2.4.1 Passengers' Satisfaction on Public Bus Transportation

The definition of satisfaction is the fulfillment of the customer (Korale et al., 2015). Counting levels of over-fulfillment, one may decide that a product's or service's features offer a gratifying amount of consumption-related fulfillment. A comparison form that gives rise to the satisfaction emotions could be a requirement fulfillment form. Any differences result in expectations; positive expectations maintain satisfaction while negative expectations produce disappointment.

According to Parasuraman et al. (1988) and Gronroos (1984), service quality is determined by contrasting customer expectations with service perception. In general, there are five different components that make up service quality: tangibles (facilities, tools, and staff appearance), reliability (ability to deliver the promised service consistently and accurately), responsiveness (willingness to assist customers and provide prompt service), assurance (knowledge and courtesy of employees and their capacity to inspire trust and confidence), and empathy (caring, individualized attention the firm provides its customers). (Oktiani Astuti Budiono, 2009)

The long-term overall assessment of a firm's performance affects the attitude toward service quality. Service quality is an externally observed attribute based on the customer's involvement with the service as experienced by the customer (Zeithaml & Bitner, 2006) Service quality is determined by assessing the interaction, result, and physical environment quality. One of the main factors that go into the consumer's evaluation of satisfaction is service quality. Quality and satisfaction in the service area have one remarkable characteristic in common, despite having independently developed. Both see service quality as a work of satisfaction and view satisfaction as a labor of expectation. In addition to formally backing up the belief that satisfaction involves quality at the counter-specific level, a quality-effects satisfaction argument must be proposed. (ALI EL ZEIN, 2019)

Understanding the relationship between quality and satisfaction is challenging due to the complex interactions between the performance factors used in quality and

satisfaction evaluations as well as the difference between encounter-specific and global judgment. The concept of performance-based quality was developed as a result of ideal expectations and unique consumer preferences. Like quality confirmations, additional performance dimension confirmations that are unrelated to the quality experience have also been demonstrated to affect satisfaction. (Oktiani Astuti Budiono, 2009)

It is required to formally support the viewpoint that satisfaction comprises quality at the counter-specific level in order to provide a quality-affected satisfaction model. As a result, quality is an important characteristic that influences how satisfied a customer is with a product or service. A product or service's quality is determined by all of its attributes that have an impact on its capacity to meet both explicit and implicit needs. The features of a good or service define its quality in the near term, which then meets consumer wants. Following this more immediate impact, it will be hypothesized that satisfaction may indirectly support judgments of overall quality. It is hypothesized that contentment is one factor on which quality is built and that satisfaction may have an impact on perceptions of quality around the world. Numerous studies on public transportation satisfaction and dissatisfaction have been conducted. (Oktiani Astuti Budiono, 2009)

The service quality items measured are derived from Friman's (2001) findings for public transportation and include reliability, employees, accessibility, and design. The constancy of a measurement is referred to as reliability. External and internal reliability are two components. The level of a measure's consistency over time is referred to as external reliability. Test/retest reliability is the name of this method of evaluating reliability. The level of internal consistency of a metric is referred to as internal reliability. The reliability analysis technique computes a number of widely utilized scale reliability measures and also gives data on the correlations between the scale's individual items. (Oktiani Astuti Budiono, 2009)

Passengers' views are an important factor for public bus transportation in a country. This perception provides for a better transportation system, such as comfort, safety, time-saving, reliability, and a better quality of life. It eases traffic in towns and cities. Compared to buying and maintaining an automobile, public transportation is less expensive. Bus lanes and other bus priority measures have eliminated the need to wait in rush-hour traffic. The quality of bus stops, the skill of bus drivers, the quality of buses, the payment system, the bus route, and road quality are encouraged to promote passenger satisfaction on public bus services.

2.4.2 Supply and Demand for Public Transportation

Each transport mode serves the function of promoting mobility since they all work toward the same common objective of satisfying derived transport demands. Unlike the resources and things that it frequently transports, transportation is a service that must be used right away because it cannot be kept. Transportation infrastructures with fixed capacities are used for mobility in order to supply transportation. A number of times, the simplest form of transportation is used to meet demand, most notably by walking through a landscape that has experienced little or no modification. (Dr. Jean-Paul Rodrigue and Dr. Theo Notteboom, 2017)

Suppliers of transportation services and consumers of these services make up the transportation market. Transport needs for the mobility of passengers and freight should be satisfied by the transport supply being able to keep up with the demand. An economic system, which consists of diverse activities carried out in various locations, creates movements that the transportation system must support. Infrastructures would be useless without mobility, and mobility would not be possible or cost-effective without infrastructures. Transport supply and demand are two notions that can be used to analyze this interdependency:

Transport Supply: The capability of transportation modes and infrastructure, typically over a limited geographic area and for a predetermined amount of time. Infrastructures (capacity), services (frequency), and networks (coverage) are used to indicate supply. Transport supply is often measured by the number of passengers, volume (for liquids or containerized traffic), or mass (for freight) that may be transported per unit of time and space. (Dr. Jean-Paul Rodrigue and Dr. Theo Notteboom, 2017)

Transport Demand: Even if those conditions are fully, partially, or not at all met. Thus, the demand for transportation can be classified as actual, where it has been quantified under current conditions, or potential, where it could occur under hypothetical circumstances. It is stated in terms of the number of people, volume, or tons per unit of time and distance, much like transportation supply.

Relationships between transport supply and demand continually change, but they are mutually interrelated. From a traditional economics perspective, the amount of transportation that the market is willing to utilize at a particular price and the amount being supplied for that price level interact until an equilibrium is found. Price changes not only have an impact on how much demand there is for transportation, but they can

also cause demand to shift to different routes, different forms of transportation, or different times of day. Structured changes in the cost of transportation may have an impact on people's and enterprises' locational choices over the long or medium term. The capacity of a certain transportation infrastructure and mode during a given time period is referred to as the transport supply. Even if they are only partially met, mobility needs for the same time period nevertheless result in transportation demand. (Dr. Jean-Paul Rodrigue and Dr. Theo Notteboom, 2017).

2.5 Reviews on Previous Studies

Oktiani Astuti Budiono (2009) studies customer satisfaction in public bus transport: a study of travelers' perceptions in Indonesia. The study's main goal is to discover more about how satisfied Indonesian bus passengers are generally. In Jakarta and Jogjakarta, Indonesia, this survey will look into how satisfied customers are overall with traditional public transportation. The research design, sample selection procedures, data gathering methods, and data analysis methods were all used in this study. There were 278 completed surveys, of which 108 were from Jakarta and 170 were from Jogjakarta. Overall research findings show that factors affecting service quality have an impact on overall satisfaction with public transportation. It is possible to use factor analysis based on many attributes as well as individual feature analysis.

Mohammed Quddus, Farzana Rahman, Fredrik Monsuur, Juan de Ona, and Marcus Enoch (2019) studied "Analyzing Bus Passengers' Satisfaction in Dhaka" using Discrete Choice Models. This study aims to investigate the relationship between Dhaka's bus service quality and its influencing factors. Discrete choice models have been created using a sample size of 955. The findings show that there is dissatisfaction with bus services, and the most significant factors in the "bad" and "very poor" assessments of service quality were identified as comfort level and driver competence. The results of this study can be used to create laws and regulations that will enhance bus transportation in Dhaka.

Mohd Faizun Mohamad Yazid Aeshah Mohd Ali Sanusi Abdul Manaf (2020) study that "Customer Satisfaction In Public Transport Service". This research shows that customer views towards service quality in the public transport services in Kuala Lumpur, Malaysia are analyzed. Five dimensions of service quality were measured to identify which ones play necessary roles in customer satisfaction. 300 questionnaires were distributed among the people who commute daily using public transport. Data collection was based on convenience sampling. The results indicated that only

reliability and tangibles are significant for customer satisfaction, while the other three dimensions are not supported. The service provider can use the results to study customer perceptions of their services. It can be used to improve their services and gain more trust from the customers.

Thet Nay Yi (2015) studied "The Study on Public Transport System." The objective of this survey is to study the existing public transport system of Yangon City and to analyze the existing road transport system of Yangon City, which is mainly composed of bus transport. The method is descriptive analysis. This study discovered that the current road transportation system is insufficient and cannot meet the needs of the commuting public efficiently. There is a need to upgrade the quality of roads and buses. As a result of rapidly growing motorization, Yangon is also facing problems such as traffic congestion, air pollution and inadequate access to transport facilities. However, it can be solved and its impact reduced by establishing or transforming more effective systems.

Radnovi, B., Milo Mari, R., Radnovi, V., Ili, M., & Luka, D. (2015) studied "Passenger Satisfaction with Public Transport Service in the City of Belgrade". The major aim is to evaluate the idea that there is a strong relationship between passenger happiness and elements like good service, staff' attitudes and behaviors, adequate information, high-quality cars, line routes, and schedule. For evaluating the findings and examining the formulated hypothesis, regression analysis and the correlation coefficient were utilized. According to an empirical study, there is a strong connection between the following factors and passengers' satisfaction with public transportation services. The results obtained provided suggestions and instructions for enhancing and raising the caliber of public transportation services. The study's findings also serve as a springboard for further investigation into the associations between different subgroups of the parameters that were studied and passenger satisfaction with services.

Aye Thida (2016) studied that “A Study on the City Bus Lines Transportation in Yangon Region”. This study's goal is to examine Ma Hta Tha, Yangon's major public transportation provider between 2001 and 2011, as well as other bus firms. The main objective of the study is to describe the current situation and problems with the city bus system in Yangon. The Yangon Region Buses Control Committee's head office and the associated bus lines provided secondary data for this study, which is mostly descriptive in nature. The drivers are therefore incompetent and receive insufficient safety training. The buses are in poor condition. There is not enough regulation of bus terminals and

stops to improve safety. It is vital to reevaluate the locations and facilities of the bus stops. In particular, with the development of a Bus Rapid Transit (BRT) system, bus priority procedures should be put into place over the long term.

Aye Hnin Hnin Naing (2016) studied "satisfaction of public transport services in Yangon". Additionally, the objective of the study is to assess how satisfied consumers of public transportation are with the transportation system. In order to analyze, a linear regression equation is used to define the efficiency factors for public transportation networks. These efficiency elements are separated into four groups using factor analysis. Retests of these groups are conducted using the reliability analysis as a guide. Using the mean and weight approach, the customer satisfaction index for four public transportation options is computed. As the finding that the ability to satisfy customers or users is crucial for any service, not just in the transportation industry but also in other sectors of society. From an environmental standpoint, public transportation networks are now considered crucial.

Aung Htoo Khaing (2018) studied "the relationships between perceived service quality, perceived value, perceived expectation, customer satisfaction, and Myanmar people's satisfaction with public transportation in Yangon". The purpose of the study is to investigate the perceptions of the Myanmar population in Yangon on service quality, value, and expectations for public transportation and to examine the effects of perceived service quality, perceived value, and perceived expectations (independent variables) on the degree to which customers are satisfied with public transportation. Survey-based primary data collection served as the foundation for the study. All 232 samples were chosen at random. For data analysis and testing of hypotheses, multiple regression analysis, standard deviation, and mean are used. It was discovered that value and anticipation were the elements that affected how satisfied customers were with the transportation service in Yangon.

Than Htike Soe (2018) studied " the customer perception of the use of card payment systems in Yangon public transportation." The purpose of this study is to determine the card payment method used by Yangon public transportation and to investigate how customers feel about using this system at present. Using the convenience sampling method, 200 commuters are selected. Card systems' costs, security of using card systems, and ease of using card systems are the criteria utilized to assess commuter perception. Findings show that commuters have positive perceptions of all factors, but that they are less positive about card payment security.

Findings indicate that in order to increase public satisfaction, the authorized person in charge of the public transportation sector should take into account the safe and convenient card payment system and set an appropriate card selling price.

CHAPTER III
ROAD TRANSPORTATION IN YANGON CITY

3.1 Profile of the Yangon City

The largest and most commercial city in Myanmar is called Yangon, often spelled Rangoon. The Mon people, who were living in Lower Burma at the time, established Yangon as Dagon at the beginning of the 11th century. Beginning in the 14th century, Dagon developed into a significant pagoda town for pilgrims under the Hanthawaddy Kingdom. The first king of the Konbaung Dynasty, King Alaungpaya, conquered Dagon in 1755, expanded the town and named it Yangon. In 1823, Yangon had a population of roughly 30,000. During the First Anglo-Burmese Conflict (1824–26), the British took control of Yangon, but after the war, the British gave it back to the Burmese. (YCDC, 2022)

In the Second Anglo-Burmese War of 1852, the British took control of Yangon and all of Lower Burma, turning it into the commercial and political capital of British Burma. Following the war, the British relocated British Burma's capital from Moulmein (today's Mawlamyine) to Yangon. Following the British conquest of Upper Burma in the Third Anglo-Burmese War of 1885, Yangon was designated as the capital of the entire Burma under British control. From 72.52 square kilometers (28.00 sq mi) in 1901 to 86.2 square kilometers (33.3 sq mi) in 1940, much has been expended. There were 500,000 people living in Yangon before World War II (1942), and only approximately a third of them were Bamar (Burman). The remainder included Karens, Chinese, Anglo-Burmese, and other people. From Thaketa, North Okkalapa, and South Okkalapa in the 1950s. (YCDC, 2022)

The size of Yangon City grew from just 208.51 square kilometers in 1974 (80.51 sq mi) to 346.13 square kilometers (133.64 sq mi) in 1985. In Hlaingthaya, Shwepyitha, and South Dagon in the 1980s, successive governments constructed satellite towns. However, since the late 1980s, the city has been rapidly expanding north to where Yangon International Airport is currently located. The size of Yangon City was just 80 square miles in 1985. It had grown to a total of 134 square miles, made up of 27

townships. The military regime's alterations to the English transcription of Burmese names led to the city's name being changed to "Yangon" in 1989. The military government's more free-market policies in the 1990s drew both domestic and foreign investment, modernizing the city's infrastructure to some extent. The military government relocated much of the government to Naypyidaw, 320 kilometers (199 miles) north of Yangon, as its new administrative capital in November 2005. The largest and most significant commercial, economic, and cultural hub of Myanmar is still Yangon. Up until 2006, Yangon functioned as the nation's capital. Then, the military administration moved the country's administrative center to Naypyidaw in north-central Myanmar. Yangon, Myanmar's most populous city and most significant commercial hub, has over 7 million residents. In 2008, 598.75 square kilometers (231.18 sq mi) of the city's area had continuously risen. (YCDC, 2022)

In 2009, 33 townships and about 352 square miles were included in the city's boundaries. It speaks of the local administrative region of YCDC, which is less expensive than the area that has been set aside for the development of human settlements and housing (DHSHD). Due to the construction of new satellite towns in the east and west, Yangon has taken on the shape of a cross, with the Central Business District (CBD), Htoukkyant, Dagon (Narth), and Dagon (South) forming the east-west and north-south axes, respectively. (Thet Aung, 2012)

The Yangon City Development Committee (YCDC) is in charge of running the city. Urban planning is also coordinated by the Yangon City Development Committee (YCDC). 33 townships make up the city, which is a part of the Yangon Region. Four districts that are within the purview of the city make up the Yangon Region. A Township Development Committee oversees each township, working with local authorities to make infrastructure and beautification decisions. Myo-thit, sometimes known as satellite towns or "new towns," do not fall under these jurisdictions. (YCDC, 2022)

The list of Yangon City Townships by Western District is as follows: Ahlon, Bahan, Dagon, Hlaing, Kamayut, Kyauktada, Kyimyindaing, Lanmadaw, Latha, Mayangon, Pabedan and Sanchaung. The eastern districts are Bototaung, Dagon Seikkan, Dawbon, Mingala Taungnyunt, New Dagon East, New Dagon North, New Dagon South, North Okkalapa, Pazundaung, South Okkalapa, Tamwe, Thakata Thingongyun and Yankin. Dala and Seikkyi Kanaungto are from the Southern District.

The Northern District includes Insein, Hlaingthaya, Mingaladon and Shwepyitha. (Wikipedia, 2022)

3.2 Population Density in Yangon City

Yangon's growth is driven by its expanding population, which has a direct impact on the city's public transportation infrastructure. For a better understanding of the past, present, and future demand for public transportation, the population growth and distribution of Yangon must be examined.

Three factors often contribute to population growth in Yangon: natural rise, migration from other locations, and boundary extension. Before Alaungpaya was conquered in 1775, Yangon was just a small fishing village. It first appeared as a new port for seagoing vessels and later developed into a little town that was hardly more than a village. At that time, Yangon had a population of roughly 10,000. Since the First Anglo-Burman War began in 1824, Yangon's population has steadily grown. It was only around 20,000 in 1856, approximately 40,000 in 1872, over 100,000 in 1872, 134,000 in 1881, 248,000 in 1911, and 293,000 in 1921, 400,000 in 1931, and it surpassed 500,000 in 1941. (Mi Cho Mar, 2010)

During the time of British rule, the port's commerce and industry continued to grow, which contributed significantly to the population's growth. The Indian migrants during that time were one of the key factors in the city's population expansion, which only started to decline after World War II (1942). The population of Yangon was 825,799 people at the time of the Population Census in 1953. Internal migration brought on by insurgency in rural areas was a major factor in the population growth during the years immediately following independence till the 1960s. According to population censuses conducted in 1973 and 1983, Yangon has a population of 2 million and 2.5 million people. In 2008, 4.6 million people lived. In 2010, a population estimate of 4.35 million (6.72 million in Yangon Region) and 4.753 million people in 2014, according to population censuses, were estimated to be living in the country and 5.16 million people and 5.4 million people were estimated in 2018 and 2021. The population growth rate had an annual increase of nearly 2%. In general, a city's downtown or CBD had a higher population density than its suburbs, which had a lower population density. Table 3.1 shows population growth in Yangon City in 2021.

Table (3.1) Population Growth in Yangon City

No.	Year	Population	Growth Rate
1	2010	4,381,000	2.05%
2	2011	4,471,000	2.05%
3	2012	4,564,000	2.08%
4	2013	4,657,000	2.04%
5	2014	4,753,000	2.06%
6	2015	4,851,000	2.06%
7	2016	4,951,000	2.06%
8	2017	5,053,000	2.06%
9	2018	5,157,000	2.06%
10	2019	5,244,000	1.69%
11	2020	5,332,000	1.68%
12	2021	5,422,000	1.69%

Sources: United Nations - World Population Prospects (2021)

3.3 Historical Background of Public Bus Transportation in Yangon City

More than 5 million people live in Yangon City, while there are nearly 7.4 million people living in the surrounding area. The population of the city has been growing at a pace of roughly 2% per year. The urban spatial organization of Yangon is comparatively monocentric. There are many people living in the city's center. The majority of jobs are located in urban cores. Suburban areas still have low densities. In contrast, suburban and outlying areas are experiencing faster rates of population expansion. The public transportation options in Yangon City are varied and include buses. In Yangon, bus travel accounts for over half of all travel, and it is the most popular method for all socioeconomic classes. (World Bank, 2020)

The Yangon Division Bus Control Committee oversees and coordinates the organization of privately owned buses (YDBCC). Since most people in Yangon use buses to get to work, school, and the market, there aren't nearly enough of them to meet demand. The committee was created on August 20, 1962, and it serves as a crucial body for regulating public transportation in the Yangon region, particularly in the city's congested urban area. Over the course of its 50-year existence, it has addressed a wide range of issues relating to public transportation services. The Revolutionary Council

Government established the Committee in 1962. There were a total of 1500 buses available for use as public transportation in Yangon at the time. (Thet Nay Yi, 2015)

The Road Transport Corporation (RTC) had 18 bus lines operating in 1988, including 329 vehicles on 12 regular and 6 special lines. The Road Transport Corporation (RTC) used 25-seat KM Hino buses and increased the number of buses with French-built Reynold buses and locally developed articulated buses. There are a total of 29 bus lines operated by the Yangon Division Bus Control Committee (YDBCC), including 16 regular lines, 13 special lines, and 13 express special lines. At that time, there were more than 1,600 buses operated by the Yangon Division Bus Control Committee (YDBCC). World War II surplus modified vehicles with a 20-seat capacity were used on the regular lines, and converted Toyota Hilux pick-up trucks with a 14-seat capacity were utilized on the express lines. The E-2,000 and T-2,000 types of trucks, each with a capacity of 18 seats, were also employed by cooperatives and veteran organizations as buses. (Thet Nay Yi, 2015)

In the city, 2 million people travel frequently. The bus, circular train, and ferry boats provided 1.48 million, with the rest being handled by taxis, other vehicles, and tri-shows. Nearly 93% of the 1.48 million travelers who traveled frequently used buses, as opposed to the roughly 5% and 2% who traveled by circular trains and ferry boats, respectively. 73% of the overall traveling frequency was used by Yangon Division Bus Control Committee (YDBCC) buses, and 16% by Road Transport Corporation (RTC) buses.

After the State Law and Order Restoration Council (SLORC) took power in 1988, new towns such as Shwepyithar, Hlaingthayar, and Dongon Myothit were built, the frequency and amount of travel increased. Small cars known as "Express" were replaced with converted light trucks like Dyna or Counter, while outdated BM Hino buses were replaced with imported, reconditioned buses like Daewoo buses in order to increase the efficiency of buses. (Thet Nay Yi, 2015)

Driving trishaws, bicycles, and motorbikes is prohibited in the city of Yangon. Pickup bus lines are not permitted to operate in Latha, Lanmadaw, Pebedon, Kyauktada, Batahtaung, or Pazundaung Townships of Downtown Yangon as of February 2010. In order to noise pollution, the use of car horns was prohibited in six townships of Downtown Yangon in May 2003. The city-wide ban on car horns was implemented in April 2004. Both the governmental and private sectors presently run a

fleet of buses, pick-ups, modified light trucks, and micro buses in Yangon City. (Thet Nay Yi, 2015)

Many of the roads are disrepair and narrow to support the growing number of cars. The great majority of Yangon residents rely on a massive bus network to go around because they cannot afford to buy cars. As a result, in 2005 the government directive to reduce the cost of imported petroleum, all buses and 80% of the taxis in Yangon now operate on Compressed Natural Gas (CNG). Approximately 6300 crammed buses operated by over 300 public and private bus lines travel the city daily, carrying over 4.4 million people in 2006. From the Dagon Ayeyar Highway Bus Terminal and the Aung Mingala Highway Bus Terminal, highway buses depart towards other cities. (Thet Nay Yi, 2015)

Yangon's Ma Hta Tha, which translates to "Yangon Division Motor Vehicles Supervisory Committee," was the previous name of Yangon's public transportation system. This Committee was established in 1962 and disbanded on January 15, 2017. The Yangon Region Transport Authority (YRTA), which had been established on July 8, 2017, took its place. The Yangon Region Transport Authority (YRTA) is the Yangon Region's operational transit agency. During the early days of the switch from the Ma Hta Tha to the Yangon Bus Services (YBS) system, passengers traveling outside of Yangon encountered difficulties. According to a statement made during a press conference, all 300 bus lines registered with the Yangon Division Motor Vehicles Supervisory Committee (Ma Hta Tha) will be replaced on January 16 by 61 new bus lines. (Dr. Mon Mon Aung, 2017)

In order to oversee all transportation activities in the Yangon Region, the Yangon Region Transport Authority (YRTA) was dissolved and replaced by the Yangon Region Private Transportation Committee (YRTC) on June 23, 2021, with 10 members, including the chairman. They are one chairman, one vice president, six members, one secretary and one associate secretary. The vision of the Yangon Region Private Transportation Committee (YRTC) is the development of safe and secure public transport. The Yangon Region Private Transportation Committee (YRTC) has six missions for Yangon Bus Services. (i) the prosperity of the Yangon Bus Services (YBS) system; (ii) the rise of integrated public transportation; (iii) the improvement of activities related to Smart Mobile Activities; (iv) the reduction of Yangon's traffic congestion by improving public transportation; (v) making freight transportation the cheapest and most efficient; (vi) the improvement of Mass Rapid Transit (MRT); and

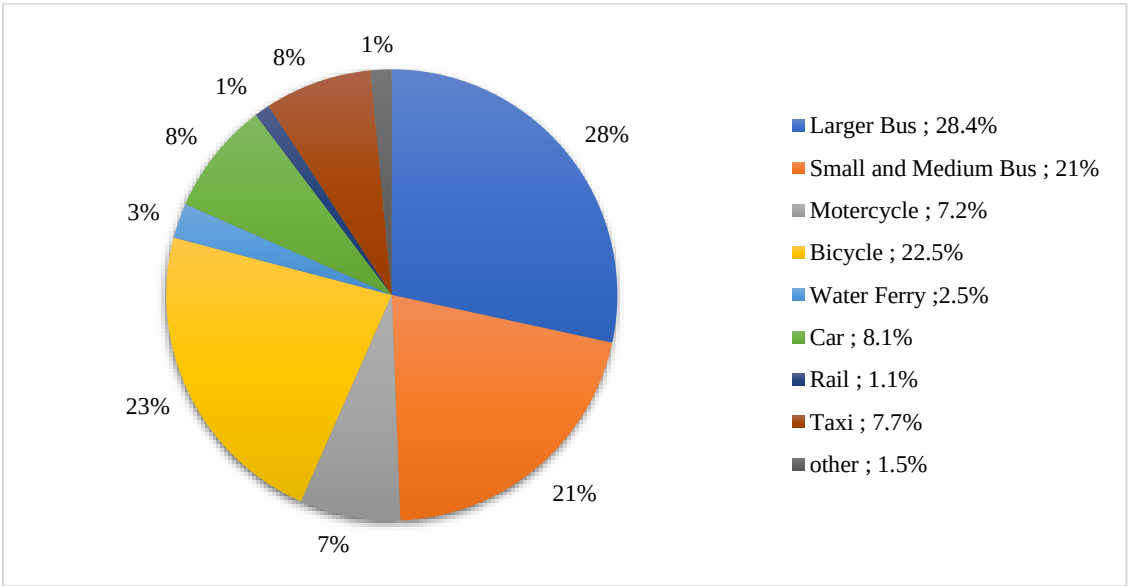
Yangon Region-based socio-economic development through the improvement of Yangon city transportation.Nowadays, this organization is one of the public bus transport authorities and serves to improve the public bus system.

3.4 Whole Bus Transportation Service in Yangon City

Urban transportation conditions in Yangon have been rapidly deteriorating since 2012. The number of private vehicles has expanded as a result of the economic recovery and the easing of import and licensing restrictions on vehicles. Although they are increasingly used in non-urban areas of the region, motorcycle and bicycle restrictions have severely restricted their use in Yangon City. In the same period, from 2010 to 2017, motorization in the Yangon Region nearly tripled. An urgent problem that is threatening the city's productivity and quality of life is traffic congestion. (World Bank, 2020)

In 2022, there will be roughly 1.9 million daily bus riders. Across all income levels, those who do not own private vehicles have the highest bus mode share. Although the modal share for buses is still high, ranging from 18.2% to 24.1% across different income groups, it is highest for the vehicle owner group at almost all income levels. An essential benefit for Yangon in developing its urban transportation system is the city's high modal share of bus transit. Figure (3.1) shows the modal split excluding walking (YUTRA 2019). (World Bank, 2020)

Figure (3.1) Modal Split Excluding Walking (YUTRA 2019)



Source: Myanmar Urban Mobility Overview Notes

The Yangon Regional Government (YRG) made significant improvements to its bus transit system between 2015 and 2017. The Yangon Motor Vehicles Supervisory Committee (Ma Hta Tha), a heritage entity, was transformed into the Yangon Region Transport Authority in 2016, marking the biggest stride forward (YRTA). With the exception of rail-based transportation, which is governed by Myanmar Railways, Yangon's designated dedicated transport authority (YRTA) has the jurisdiction to regulate a variety of transportation methods, including buses, school buses, coaches, water buses, and taxis. (World Bank, 2020)

On January 16, 2017, the Yangon Region Public Transportation Authority (YRTA) inaugurated the Yangon Bus Services (YBS) program. It has made progress in the right direction in terms of offering public transportation services. The YBS aimed to improve bus service quality while reducing traffic congestion and commute times for around 1.9 million people. To address the issue of several operators competing on the same key routes along arterial highways, the new bus system first limited the number of bus lines. Additionally, YRTA replaced a sizable portion of its old, dirty buses with new ones. (World Bank, 2020)

3.4.1 Road Network of Yangon City

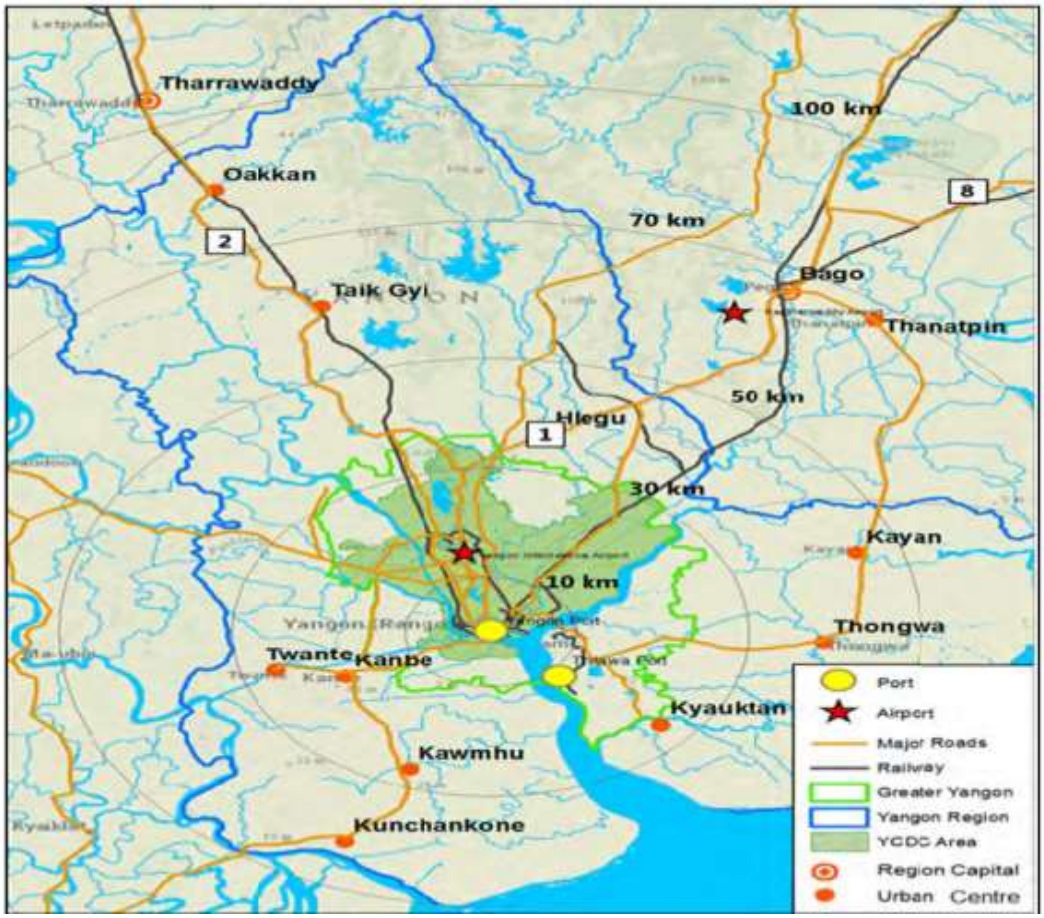
The most significant urban area in the entire nation is found in Yangon City, which is situated in the lower commercial areas of Myanmar. The development of new sectors added to the existing pattern has frequently been used to carry out urban expansion of the greater built-up region. The north also has a longer road network layout. South as opposed to East-West movement. Out of 45 townships in the Yangon Region Northern District and Yangon Southern District, 33 townships are under the control of the Yangon City Municipal Development Committee (YCDC), and 12 townships are beyond the YCDC's influence zone. These three districts are located in Yangon.

According to the layout of the city, Yangon's road system was shaped like an elongated snake that ran north to south. Since the time of the British Administration, Fraser's built a road in the downtown area that is primarily made up of seven major north-south highways and five important east-west roads. Between major roadways, symmetrical little streets were constructed. Bogyoke Aungsan Road, Ahnawyahtar Road, Maharbandoola Road, Merchant Road, and Strand Road are the five major roads

that run north to south (Kannar Road). With the exception of strand roads, all of the roads that extend in an east-west direction are subject to two-way traffic regulations.

While some significant highways in the east were not rebuilt, major routes from north to south already had their width increased to six lanes. There are still four lanes going west. Traffic signals govern intersections on the major road grid, and there are currently 121 traffic signal lights in the main business district and the busiest intersections in suburban areas. Kyimyindine Kannar Road, Lyonegyi Road, Phone Gyi Road, Lanmadaw Road, Shwedagon Pagoda Road, Alapya Pagoda Road, Upper Pansodan Road, Theinbyu Road, Upper Pazundaung Road, and Maharbandoola Bridge Road are the principal access routes to the downtown area (from west to east). Figure (3.2) show the transport network in Yangon region.

Figure (3.2) Transport Network in Yangon Region



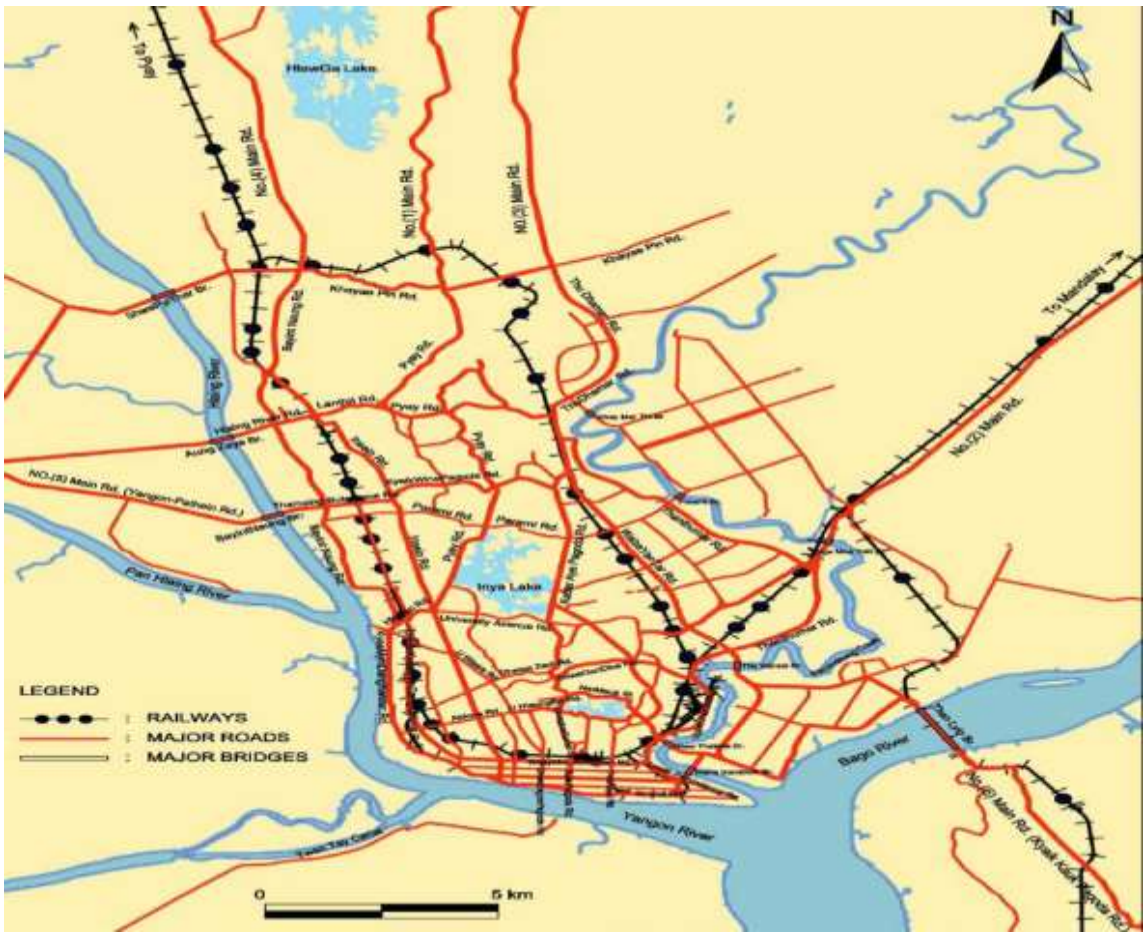
Sources: Project for comprehensive urban transport plan of the greater Yangon (YUTRA)2019

Pyay Road in the west and Kabaraye Road in the east are two major roads that have been utilized for a very long time as article lines connecting the main business district with suburban areas and outlying towns. Today, new major transportation is

being constructed in a variety of directions to link urban areas with suburban ones. The roads that connect the central business district and the suburbs are Kyimyidine Kannar Road, lower Kyinmyidin Road, Bahan Road, Banyardala Road, and Shukhintha Myobutt Road.

Seven major interstates lead into the city. Express highway roads that lead to Bago, Mandalay, Mawlamyaing are Highways No. 1, 2, and 3. Both No. 4 and No. 5 act as detours on the express highways to Pyay and the western portions of important cities like Nyaungdon and Pathein. New satellite settlements up to Yangon's south and south-eastern regions are accessible by Highway No. 6. The No. 7 highway route links the south and south-western parts of the regions. Yangon-Insein Road is a new main route that connects Yangon and Insein. The Bayintnaung main road, which runs together the Hlaing River, was recently constructed, along with the Bayintnaung Whole Sale Market and a new bus line. Figure (3.3) show the current road network in Yangon City.

Figure (3.3) Current Road Network in Yangon City



Source: JICA Study Team based on information from YCDC, 2012

Almost all of Yangon City's major transportation have a landscaped middle and dual two or three lanes. The duties of each road are listed below, even though the Yangon City Development Committee (YCDC) classifies roads according to their number of lanes and width. Table 3.2 show summaries the configuration of the major road in Yangon City.

Table (3.2) Major Road Configuration in Yangon City

No.	Road Name	Type
1	No. (1) Main Road	2-way, 6 lanes
2	No. (2) Main Road	2-way, 2 lanes
3	No. (3) Main Road	2-way, 4 lanes
4	No. (4) Main Road	2-way, 4 lanes
5	No. (5) Main Road	2-way, 4 lanes
6	No. (6) Main Road	2-way, 4 lanes
7	BayintNaung Road	2-way 6 lanes
8	Kyeemyindaung Road	2-way 6 lanes
9	Upper Kyeemyindang Road	2-way, 4 lanes
10	Insein Road	2-way 6 lanes
11	Pyay Road	2-way 6 lanes
12	U Wisara Road	2-way 6 lanes
13	ThuDamar Road	2-way 6 lanes
14	KabaAye Pagoda Road	2-way 6 lanes
15	Shwedagon Pagoda Road	2-way 4 lanes
16	Zoological Garden Street	2-way 6 lanes
17	Theinbyu Street	2-way 4 lanes
18	Waizayandar Road	2-way 6 lanes
19	Upper Pazudaung Street	2-way 4 lanes
20	Lower Pazudaung Street	2-way 4 lanes
21	ThanThumar Street	2-way 4 lanes
22	Khayaepin Road	2-way 2 lanes
23	Lanthit Road	2-way 4 lanes
24	Thamaing Buteryone Road	2-way 4 lanes
25	Kyaik Wine Pagoda Road	2-way 4 lanes

Table (3.2) Major Road Configuration in Yangon City (Continued)

No.	Road Name	Type
26	Bogyoke Aungsan Road	2-way 4 lanes
27	Parami Road	2-way 4 lanes
28	Hledan Street	2-way 6 lanes
29	University Avenue	2-way 4 lanes
30	Dharma Zedi Road	2-way 6 lanes
31	ShweGoneDine Road	2-way 6 lanes
32	NatMauk Street	2-way 6 lanes
33	Ahlone Road	2-way 4 lanes
34	U Htaung Road	2-way 4 lanes
35	PhoneGyee Street	2-way 4 lanes
36	Sule Pagoda Road	2-way 6 lanes
37	Pansodan Street	2-way 4 lanes
38	BoMyatHtun Road	2-way 4 lanes
39	BoThaHtaung Payar Road	2-way 4 lanes
40	Anawratha Road	1-way 3 lanes
41	Maharbandoola Road	1-way 4 lanes
42	Merchant Road	1-way 4 lanes
43	Strand Road	2-way 6 lanes

Source: Prepared by JICA Study Team based on information from YCDC (2012)

3.4.2 Public Buses Lines in Yangon City

On April 23, 2021, the Yangon Region Transportation Authority (YRTA) was disbanded, and the Yangon Region Private Transport Committee (YRTC) was established to manage all transportation activities in the Yangon Region. YBS is now reorganized into 20 companies and is managed by YRTC. There are 2 types of buses, which are city buses and minibuses. There are 895 minibuses and 4,840 city buses registered with YRTC. The total number of buses in YBS companies is 5,735 currently operating. (YRTC report, 2022)

Yangon Urban Public Transportation Co. Ltd (YUPT) has 26 bus lines. They use city bus 1,092 and minibus 115 for daily journeys. A total of 1,207 buses are used for 26 bus lines. This company has 21 % of the whole YBS in 20 organizations. Yangon

Bus Public Company Co., Ltd (YBPC) operates 14 bus lines, the most frequent of which is city bus 615. This company has 10.7% of the whole YBS in 20 organizations. Yangon Urban Public Transportation Co. Ltd (YUPT) has 9 bus lines. They are using city bus line 314 for their daily journey. This company has 5.8% of the total YBS in 20 organizations. Luuhtu Matesway Public Company Limited has 6 bus lines. They are using city bus 265 for their daily journey. This company has 4.6 % of the whole YBS in 20 organizations. Omni Focus General Services Public Co., Ltd. operates nine bus lines and relies on City Bus 900 on a daily basis. This company has 6.97 % of the whole YBS in just 20 organizations. The current YBS Companies and Bus Lines List in Yangon City can be seen in Appendix (1).

Khit Thit Bayintnaung Public Co. Ltd. has 11 bus lines. They are using city bus 370 and minibus 177 for daily journeys. A total of 547 buses are used for 11 bus lines. This company has 5.9 % of the whole YBS in just 20 organizations. Shwe Taung Paing Transport Public Co. Ltd. has seven bus lines. They are using city bus 173 and minibus 43 for daily journeys. A total of 216 buses are used for 7 bus lines. This company has 3.76 % of the whole YBS in 20 organizations. Kong Baung Yangon Public Co., Ltd. has 2 bus lines. They are using City Bus 149 for their daily journey. This company has 3.38 % of the whole YBS in 20 organizations. Amyintmyatsone Power Group Public Transport Co., Ltd. has 4 bus lines. They are using city bus 78 and minibus 59 for daily journeys. A total of 137 buses are used for 4 bus lines. This company has 2.28 % of the whole YBS in 20 organizations. Power Eleven Public Co., Ltd. has 3 bus lines. They are using city bus 163 and minibus 58 for their daily journey. A total of 221 buses are used for 3 bus lines. This company has 3.85 % of the whole YBS in 20 organizations.

North Yangon Titegyithar Public Co. Ltd has 4 bus lines. They are using city bus 78 and minibus 24 for their daily journey. A total of 102 buses are used for 4 bus lines. This company has 1.7 % of the whole YBS in 20 organizations. Shwelankhing Public Co. Ltd has only 1 bus line and uses 71 buses for passengers. This company has 1.28 % of the whole YBS in 20 organizations. Golden Yangon City Transportation (GYCT) Co. Ltd has 12 bus lines. They are using city bus 390 and minibus 53 for their daily journey. A total of 443 buses are used for 12 bus lines. This company has 7.7 % of the whole YBS in 20 organizations. RCBT Public Co. Ltd has 10 bus lines. They are using city bus 112 and minibus 157 for daily journeys. A total of 269 buses are used for 10 bus lines. This company has 4.69 % of the whole YBS in 20 organizations. Sanwaila Public Co. Ltd has only 1 bus line and uses 46 buses for passengers. This company has

0.8 % of the whole YBS in 20 organizations. TransLink Public Co., Ltd. has seven bus lines. They are using city bus 182 and minibus 52 for daily journeys. A total of 234 buses are used for 7 bus lines. This company has 4.08 % of the total YBS in 20 organizations.

City Liner Public Co. Ltd have only 1 bus line and uses 11 buses for passengers. This company has 0.19 % of the whole YBS in 20 organizations. Shwepyitharther Public Co., Ltd. operates three bus lines, with daily trips taking place on city bus 190, minibus 32, and mini bus 32.A total of 234 buses are used for 7 bus lines. This company has 3.87 % of the whole YBS in 20 organizations. Transport Star Public Co. Ltd has 2 bus lines. They are using city bus 82 and minibus 18 for daily journeys. A total of 100 buses are used for 2 bus lines. This company has 1.7 % of the whole YBS in 20 organizations. Thet Yin Aung Transport Public Co. Ltd has 3 bus lines. They travel by city bus 25 and minibus 46 on a daily basis. A total of 121 buses are used for 3 bus lines. This company has 2.1 % of the whole YBS in 20 organizations. YBS Routes and Distances can currently be seen in Appendix (2).

According to the registered list, there are a total of 140 bus lines, of which only 128 are running with numbers. In addition, there are airport buses and buses that run under other names. According to the list sent by the relevant bus companies and private supervision groups, 132 bus lines are allowed to operate. Two companies have the same number of bus lines. Eight bus lines are 12, 21, 23, 33, 39, 40, 65, and 79 mentioned. According to the lists sent by the relevant bus line companies and private supervision groups, the number of lines running is 134, and 6 lines are running with the other name of the bus line, and the total number of traffic routes is described as 140.

Table (3.3) YBS Companies' Monthly Inventory of Transportation

Number of Buses	Total Buses	Total driving bus per month	Total Frequency per month	Total Passenger per month	Total driving bus per day	Total Frequency per day	Total Passenger per day
City Bus	4,840	81,731	273,925	32,422,273	2,724	9,131	1,080,742
Mini Bus	859	12,633	42,668	2,959,014	421	1,422	98,634
Total	5,735	94,364	316,593	35,381,287	3,145	10,553	1,179,376

Source: Yangon Region Public Transport Committee YRTC (July,2022)

Table (3.3) shows the YBS companies' inventory of transportation as follows. In July 2022, the average total number of vehicles per day was 3,145 buses, and the total frequency of vehicles per day was 10,553 buses. The average total number of passengers per day is 1.2 million. The average total daily income per day is 233 million Kyats**.** The average total number of vehicles per month is 94,364 buses, and the total frequency of vehicles per month is 316,593 buses. The average total number of passengers per month is 35 million. The average total daily income per month is 7,726 million Kyats.

3.4.3 Payment System of Yangon Bus Services (YBS)

On YBS bus services in Yangon city, the Yangon Region Private Transport Committee (YRTC) will continue to use the "Electronic Payment System." In mid-2020, the YPS cards were introduced, and more than 60,000 cards were used on 1,900 buses by passengers. The Yangon Regional Private Transport Corporation (YRTC) is working to enable card payments via the Yangon Payment System (YPS). All service issues and passenger double charges will be resolved by this method. Buyers do not have to pay for the YPS cards if they make a 3,000-kyat top-up, as the YRTC sets the price of the cards at 2,000 kyats.

The Yangon Region Government officially recognizes the YPS Card as a legal card. YPS cards will be used to ride YBS buses. This card is to be used by the Yangon Public Transportation Service. YPS Customer Service Centers and G&G Stores, which are YPS Authorized Representatives, both sell YPS Cards. This YPS Card is available for purchase by all residents of Myanmar and foreign nationals. The effectiveness of the YPS Card will be under YPS's control.

All YPS cards have a one-year warranty from the date of purchase, and if something goes wrong with the card, a free replacement card is likewise covered by a one-year warranty. Customers can deposit at G&G stores that are YPS Authorized Distributors with a minimum of K3,000 and can ask about the funds on the card at YPS Customer Service Centers for K2,000. The bus validator will also display the remaining balance.

According to the Yangon Region Private Transport Committee, the YBS system's card payment system has been installed on more than 1,900 buses, and talks with the relevant bus lines are currently being conducted (YRTC). The equipment is currently installed in 608 vehicles operated by YPBC, 304 by Bandoola, 700 by YUPT,

265 by Ludu, and 27 by JYCT, according to the data of YRTC. Yangon Region Private Transport Authority (YRPTA) oversees the operation of Asia Starmar Transport Intelligent Co. Ltd. With the Yangon Payment System (YPS)card, 2,700 buses are now being operated by 51 bus lines. Over 500,000 commuters each day are thought to exist. Using the Yangon Payment System (YPS) Card can be seen in Appendix (3).

CHAPTER IV
SURUEY ANALYSIS

4.1 Survey Profile

Public bus transportation is the main transport system for the people in Yangon City. The population of Yangon City has rapidly grown yearly. People migrate from rural to urban areas for various reasons. The majority of people who use public transportation are low- and middle-income. As the population increases, the city needs to have a better quality of public transportation. Public transportation contributes to well-being, such as the expansion of business and employment prospects, and it has a significant impact on people's quality of life. Passenger satisfaction on bus transportation systems has many implications for changes to improve service quality. Bus travelers want to get reliability, comfort, and safety. This will ensure satisfaction. This research asked the travelers using the bus in the Western District, especially at Yangon University of Economics. This study period is used for the primary data analysis on five variables during July to August 2022 and secondary data analysis during 2011 to 2021.

The dependent variable used in these studies is overall satisfaction with Yangon public bus transport service. Independent variables are specific service quality attributes that consist of the seven parts of public bus transport departure. They are demographic characteristics of YBS travelers, travel patterns, and passenger satisfaction on public bus transportation such as passenger satisfaction at bus stops, passenger satisfaction at drivers' stations, passenger satisfaction on the bus itself, passenger satisfaction at payments, and passenger satisfaction on the bus routes. Data was collected using a questionnaire, the most common tool to evaluate overall satisfaction with Yangon Bus Services (YBS).

4.1.1 Sample Design

These studies were collected about the data of public bus transport with a primary survey, and the secondary data was obtained from the bus service organizations

such as Yangon Regional Private Transportation Committee (YRTC), website, internet, and journals. The primary data used for analysis is the satisfaction of bus travelers. The quality of bus service data was gathered through a face-to-face interview with the snowball method amongst bus passengers of students, officers, teachers, and public servants in Yangon University of Economics, Western District. The survey was carried out from July to August 2022. The snowball method involved asking one bus passenger in YUE about the YBS system, counting how many other passengers there were, and then allocating questions based on the number of passengers. The survey was primarily conducted during weekdays, except the weekend. This survey will look at passenger satisfaction and dependability on public transportation. Using quantitative data analysis and measuring the Five-Point-Likert-Scale for traveler's satisfaction. The survey result shows descriptive methods, frequency statistics and percentage, graphs, reliability and correlation statistics for public bus travelers' satisfaction with YBS service in Yangon.

This survey had a total of 63 questions covering the seven parts: part one is demographic characteristics of YBS travelers; part two is about travel patterns; part three presents passengers' satisfaction on the bus stop; part four describes passengers' satisfaction with drivers; part five is about passengers' satisfaction on the bus; part six presents passengers' satisfaction with payment; and part seven represents passengers' satisfaction on the bus routes. 160 passengers were asked for their perception of these services, measured on a Five-Point Likert Scale ranging from 1 to 5 (where 1 for strongly disagree, 2 for disagree, 3 for neither agree nor disagree (neutral), 4 for agree and 5 for strongly agree). This study focuses on 160 respondents with 63 questions, including seven parts about their perceptions of YBS services.

4.1.2 Questionnaire Design

The questionnaire was divided into seven parts. Part one is about the demographic characteristics of YBS travelers. It has six questions. The questions' items correspond to the city where people live, age, sex, education, family size, work, income, disabled people, and regular travel to use public bus transport. Part two is about travel patterns, which consists of seven questions about behavior involving the purpose of the journey, gathering information, frequently using, how many people use the bus, and waiting time. Part three is about travelers' satisfaction with bus stops, which includes (9) questions about cleanliness, distance to home, seat and shelter, maintenance, route maps, bus line information, and safety. Part four is about passenger satisfaction with

the driver, including (9) questions consisting of drivers' uniforms, behaviors, skills, limited speed, safety first for passengers, comfort, stopping until the bus stops, giving seats to pregnant, disabled, and monks. Part five focuses on passenger satisfaction on the bus, with thirteen questions covering cleanliness, seat availability, seat comfort, enough room on the bus, temperature, getting fresh air, bad weather, safety on the bus, providing a dustbin, and emergency uses (extinguisher, hammer). Part six is about passenger satisfaction with the payment system, and it includes questions about cash, cards, free for the disabled, free for the elderly, free for monks, and free for children. Part seven is the final section, which is about passenger satisfaction on bus routes, and it consists of nine (9) questions about measuring long bus route distances, bus arrival times, the number of buses in one bus line, the number of bus stops on one route, providing route map information outside and inside the bus, road quality, adequate traffic light/signaling, and numerous road obstructions.

Respondents were asked to rate their satisfaction with the item of overall satisfaction and 46 specific quality attributes for public transportation. The Five Point Likert-Scale rate ranged from strongly disagree, disagree, neither agree nor disagree (neutral), agree and strongly agree. This research uses descriptive analysis. Graphs, percentages, and their correlation are used in this study. The data represents satisfaction with the conventional bus system, which is very useful data for the public transport system, and it informs the policy makers on what improvements are necessary for the public bus transportation for YBS in Yangon.

4.1.3 Target Population

The target population of this study is the age of 18 and above who live in Yangon City and also, they are the bus travelers who have used public bus transport, especially Yangon Bus Services (YBS). The age group of 20 to 50 years old was chosen since individuals in this group typically commute and most likely use public transportation as their source of transportation. Most students typically have to attend the university outside of their own quarters starting at age 20. People typically stop engaging in normal commuting behavior at the age of 50 since they have nearly retired.

4.2 Reliability Analysis

When measurements are performed by numerous times, a scale's reliability is the degree to which the results are consistent. Reliability analysis is the degree to which

a test consistently measures whatever it measures. The reliability analysis determines the percentage of a systematic variance in a scale by analyzing the correlation between the results from various scale administrations. As a result, if the correlation in the reliability analysis is high, the scale produces reliable outcomes and is thus reliable. If the alpha is.70 or greater, the instrument is regarded as being reliable.

Table (4.1) Cronbach Alpha Analysis

No.	Variable	No. of item	Cronbach Alpha
1	Passenger satisfaction on Bus Stop	9	0.700
2	Passenger satisfaction on Bus Driver	9	0.797
3	Passenger satisfaction on Bus	13	0.778
4	Passenger satisfaction on Payment System	6	0.770
5	Passenger satisfaction on Bus Routes	9	0.728

Source: Survey Data (July, 2022)

Table (4.1) shows that internal consistency is measured by Cronbach Alpha, which indicates how closely linked a group of items are to one another. The lowest related range as bus stop is the acceptable range of 0.700 because a minimum correlation coefficient of 0.7 or more is accepted. Internal consistency is higher for bus driver (0.797), bus (0.778), and payment system (0.770), while bus route has 0.728. The Cronbach Alphas' values for all variables are more than 0.7. So, this result is acceptable.

4.3 Data Analysis

The aim of the research is to measure overall customer satisfaction and the related service quality attributes that influence it the most. A questionnaire is the most common tool to investigate similar aims. The collected data will be analyzed using a statistical method. Statistical tools (SPSS) were used for data input and analysis.

Data analysis was conducted in three steps; the first was statistical analysis, which was undertaken to measure frequency and percentage. The second is that an overall satisfaction analysis was performed with the aim of measuring five variables. Third, a correlation analysis was performed to indicate the correlation between each factor and overall satisfaction. Data analysis was carried out in two ways. The first was to measure all the data collected to investigate the voice of bus passengers in Yangon

city. The key concepts in quantitative methods are reliability, overall satisfaction and correlation.

Data was collected from reliable sources, from respondents who had experience of using public bus transport. The survey questions were made based on the literature review. Reliability refers to the consistency of a measure. SPSS software offers "reliability analysis statistics." Reliability analysis allows one to study the properties of measurement scales and the items that make them up. The reliability analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale.

4.3.1 Demographic Characteristics of Bus Travelers

The following table (4.2) shows the demographic characteristics of bus travelers who take YBS bus transportation. Part one of the questioners is about the demographic characteristics of the YBS travelers based on nine questions.

According to the table (4.2), respondents consisted of 57 men and 103 women. The percentage of women is 64.4% more than the percentage of men (35.6%). This result is that most of the respondents in the school, students, workers and teachers are women.

The age range of respondents was under 20 with 6.9%, between the ages of 21–25 with 41.9%, between the ages of 26–30 with 22.5%, between the ages of 31–35 with 10.0%, between the ages of 36–40 with 3.8%, between the ages of 41–45 with 7.5%, between the ages of 46–50 with 4.4%, and 3.0% with the age of over 51. The 20-35 age group accounted for the highest number of respondents with 74.4%.

At the education level, the lowest respondents were 1.3% of secondary students, 9.4% of the respondents were basic education high school students, 41.8% of the respondents were graduates, 15.6% of the respondents were masters, 5.6% of the respondents were Ph.D and 26.3% of the respondents were university students. Although most of the workers are graduates, most of the bus users are also educated. So, most of the respondents (63%), who are educated people, use the bus services for their daily work. At the family size, 5% have two family members, 19.4% have three family members, 28.7% have four family members, 25.6% have five family members, 13.1% have six family members, and 8.2% have seven or more than eight family members. Most respondents have four or five family members with 54.3%.

Table (4.2) Demographic Profiles of Respondents

No.	Name	Particular	Frequency	Percentage (%)
1.	Gender	Male	57	35.6
		Female	103	64.4
Total			**160**	**100**
2.	Age	18 to 19	11	6.9
		between 21-25	67	41.9
		between 26-30	36	22.5
		between 31-35	16	10.0
		between 36-40	6	3.8
		between 41-45	12	7.5
		between 46-50	7	4.4
		over 51	5	3.0
Total			**160**	**100**
3.	Education	Secondary School	2	1.3
		B.H.S	15	9.4
		Graduate	67	41.9
		Master	25	15.6
		Ph.D.	9	5.6
		other (university students)	42	26.3
Total			**160**	**100**
4.	Family Size	2 peoples	8	5.0
		3 peoples	31	19.4
		4 peoples	46	28.7
		5 peoples	41	25.6
		6 peoples	21	13.1
		7 peoples	10	6.3
		Other	3	1.9
Total			**160**	**100**
5.	Work	Student	71	44.4
		Public servant	86	53.8
		Private company	1	0.6
		NGOs/ INGOs	1	0.6
		Other	1	0.6
Total			**160**	**100**
6.	Income	100,000-200000	44	27.5
		200,001-300,000	66	41.3
		300,001-400,000	48	30.0
		400,001-500,000	1	0.6
		Over 500,000	1	0.6
Total			**160**	**100**

Source: Survey Data (July, 2022)

People use public transport for work and school daily. 53.8% of the respondents are public servants, 44.4%of the respondents are students and the other eligible are especially 0.6%. People with low and medium incomes use public buses the most.

The range of income levels under 100,000 kyats was 27.5%, 41.3% of respondents have between 200,000 and 300,000 kyats of income and 30.0% have 300,000-400,000 kyats. At least 0.6% are self-employed, NGOs and others. Most respondents have an income of 200,001-400,000 kyats of 71.3%. Because the lower classes earn less and can use public transportation, the bus service should be improved.

4.3.2 Travelers' Patterns

Table 4.3 describes the traveler patterns of passengers using the YBS in Yangon City. These questions are divided into 7 parts. The title of part two questionaries is "Travelers' pattern". This analysis is to improve public bus transport and to aim to make bus passengers fulfilled in the future. 43.1% of respondents use one bus line to reach their desired destination, 51.9% of respondents use two bus lines, 3.8% of respondents use three bus lines, 0.6% of respondents use four bus lines and 0.6% of respondents use more than four bus lines.

A bus user cannot reach the desired distance using only one bus line. The respondents used two bus lines for the journey, with 51.9%. A bus user faces the difficulty of using multiple bus lines to reach a desired distance. 15.6% of respondents use public bus transport every day, 29.4% use 5 days in a week, 22.5% use 2-4 days in a week, 5% use one day in a week, 4.4% use one day in a month, 22.5% use sometime. Other reasons are 0.6%. Most of the respondents were workers and students, and 51.9% used it 2 to 5 days a week.

The purpose of the travelers, the range of the respondents, was 26.9% travelled to work, 49.4% travelled to school combined with a trip with another purpose, 6.9% were shopping trips(market), 1.3% were recreation trips, 12.5% were visit trips, 0.6% travelled to do business and 2.5% were other trips. Workers and students are the main types of bus travelers in daily use, at 26.9% and 49.4%.

Table (4.3) Travelers' Pattern

No.	Name	Particular	Frequency	Percentage
1.	Frequency in one journey	1 bus	69	43.1
		2 buses	83	51.9
		3 buses	6	3.8
		4 buses	1	0.6
		Other	1	0.6
Total			**160**	**100**
2.	How often use?	Every day	25	15.6
		5 days in week	47	29.4
		2-4 days in week	36	22.5
		1 day in week	8	5.0
		1 day in month	7	4.4
		Sometime	36	22.5
		Other	1	0.6
Total			**160**	**100**
3.	Purpose of journey	Work	43	26.9
		School	79	49.4
		Market	11	6.9
		Recreation	2	1.3
		Visit	20	12.5
		Business Place	1	0.6
		Other	4	2.5
Total			**160**	**100**
4.	Get information	Internet	67	41.9
		Bus Stop	16	10.0
		TV	1	0.6
		Ph app	25	15.6
		Friends	46	28.7
		Other	5	3.1
Total			**160**	**100**
5.	Waiting time	Under 2 min	2	1.3
		2-5 min	11	6.9
		5-10 min	42	26.3
		10-15 min	24	15.0
		15-20 min	24	15.0
		20-25 min	25	15.6
		25-30 min	19	11.9
		Over 30 min	13	8.1
	Total		**160**	**100**

Table (4.3) Travelers' Pattern (Continued)

No.	Name	Particular	Frequency	Percentage
6.	Assumption for YBS	Cheaper	122	76.3
		Clean	1	0.6
		Quickly	11	6.9
		Comfort	13	8.1
		Other	13	8.1
Total			**160**	**100**
7.	Use in Daily	Bus	136	85.0
		Taxi	16	10.0
		Rail	2	1.3
		Other	6	3.8
Total			**160**	**100**

Source: Survey Data (July, 2022)

The information gets form internet with 41.9%, from bus stops with 10%, TV with 0.6%, mobile applications with 15.6%, from friends is 28.7% and other is 3.1%. There are many items available for information about the bus, and most bus riders get information from the Internet.

Regarding the bus waiting time, 1.3% of the respondents had a waiting time of less than 2 minutes, 6.9% waited 2–5 minutes, 26.3% waited 5–10 minutes, 15% waited 10-15 minutes, 15% waited 15-20 minutes, 1.5% waited 20–25 minutes, 11.9% waited 25–30 minutes and 8.1% waited over 30 minutes. 71.9% of the respondents said that the majority of bus riders had to wait between 5-25 minutes between buses. 76.3% of the respondents' opinion is that it is cheaper, 0.6% is clean, 6.9% is quick, 8.1% is comfortable and 8.1% is other. The majority of respondents had access to a private bus vehicle (85%), taxi (10%), rail (1.3%) and other (3.8%). Most bus users in Yangon use public bus transportation due to its affordability and convenience for daily use. Therefore, Yangon Bus Services (YBS) needs to be a good transport service in order to improve everyone's quality of life.

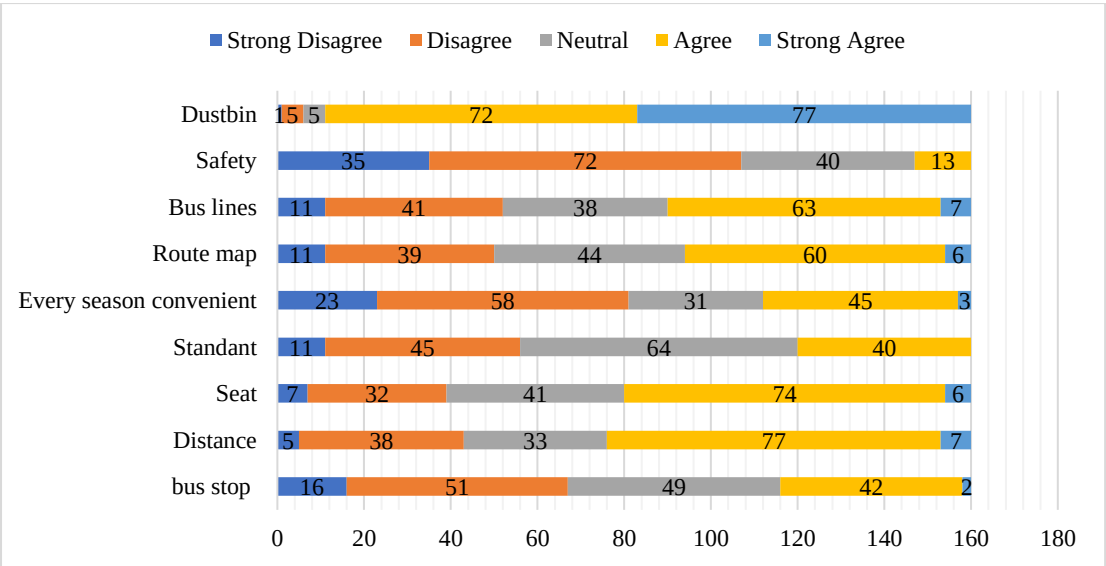
4.4 Descriptive Analysis for Passengers' Satisfaction on Bus Transportation

This analysis consists of passengers' satisfaction with bus stops, bus drivers, buses, payment systems, and bus routes. Also, it can analyze the overall passengers' satisfaction with Yangon Bus Services which shows the passengers' perception of public bus transportation. It can be used to signal the requirements for a public bus transportation system to policymakers. On a scale of 1 to 5 (1 is strongly disagree, 2 is strongly disagree, 3 is neither agree nor disagree (neutral), 4 is agree, and 5 is strongly agree) for measuring passenger satisfaction on public bus services. The standard deviation is a measurement of how much a collection of values vary or are dispersed. While a high standard deviation suggests that the values are dispersed over a wider range, a low standard deviation suggests that the values tend to be close to the mean of the collection.

4.4.1 Passengers' Satisfaction for Bus Stop

Descriptive analysis presents passenger satisfaction on bus stop as part three of the whole item. It analyses the passengers' satisfaction with bus stop cleanliness, distance from home, seat arrival, condition and maintains, every season's convenience, route map information, bus line information, safety and dustbin. It can be analyzed through Figure (4.1) and Table (4.4). According to the descriptive analysis, passengers' satisfaction on bus stop can be represented by overall satisfaction concerning the bus stop situation.

Figure (4.1) Passengers' Satisfaction on Bus Stop



Source: Survey Data (July, 2022)

Table (4.4) Overall Satisfaction on Bus Stop

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Deviation
1	Bus stop clean	16 10.1%	51 31.9%	49 30.6%	42 26.3%	2 1.3%	2.77	.992
2	Distance from home	5 3.1%	38 23.8%	33 20.6%	77 48.1%	7 4.4%	3.27	.976
3	Seat condition	7 4.4%	32 20.0%	41 25.6%	74 46.3%	6 3.8%	3.25	.965
4	Standard and maintains	11 6.9%	45 28.1%	64 40.0%	40 25.0%	- -	2.83	.885
5	Every season convenient	23 14.4%	58 36.3%	31 19.4%	45 28.1%	3 1.9%	2.67	1.092
6	Routes map information	11 6.9%	39 24.4%	44 27.5v	60 37.5%	6 3.8%	3.07	1.023
7	Bus lines information	11 9.6%	41 25.6%	38 23.8%	63 39.4%	7 4.4%	3.09	1.048
8	Safety at bus stop	35 21.9%	72 45.0%	40 25.0%	13 8.1%	- -	2.19	.872
9	Dustbin	1 0.6%	5 3.1%	5 3.1%	72 45.0%	77 48.1%	4.37	.749
	Overall mean						**3.056**	

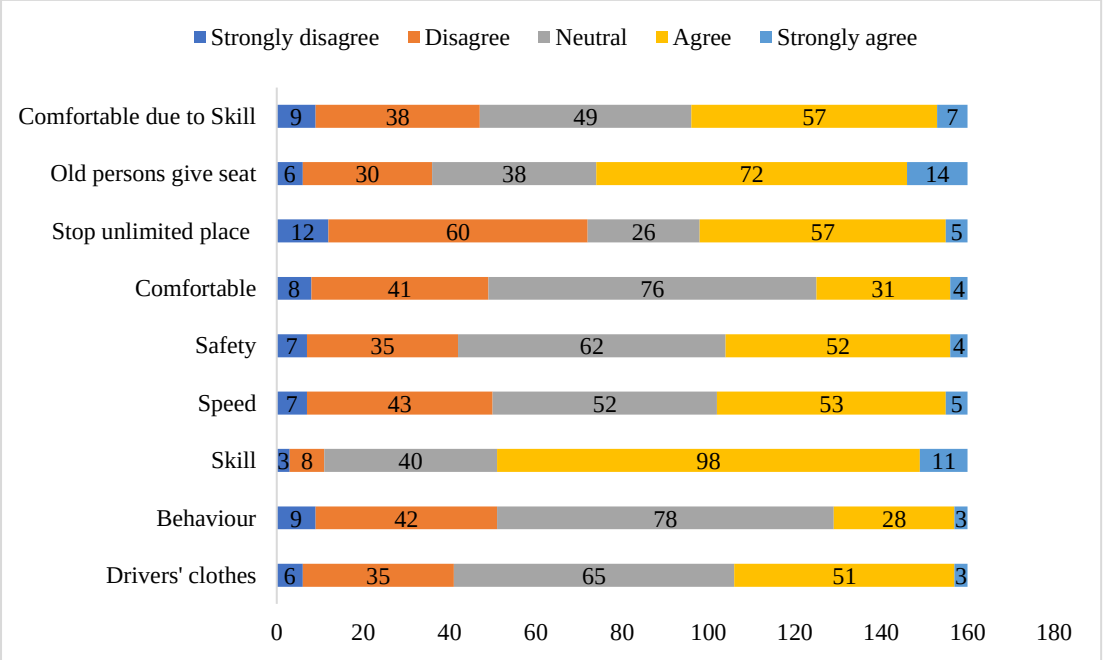
Source: Survey Data (July, 2022)

According to table (4.4), bus stop cleaning, standard and maintenance, every season's convenience and safety at the bus stop, some questions are not satisfied. Nearly satisfied items are distance from home, seat condition, route map, bus line and dustbin at the bus stop. The associated mean of all bus stop quality attributes demonstrated that passengers were neither dissatisfied nor satisfied with service quality in public bus transport (M = 3.0). Table 4.4 summarizes the distribution of responses. The mean of the overall mean also indicates that customers are neutral on the bus stop with public bus transport (M = 3.056). The public bus authority should be cleaner, safety and better maintained for the bus stop. The good environment of bus stops is an important factor for good YBS service in Yangon.

4.4.2 Passengers' Satisfaction for Bus Drivers

Descriptive analysis presents passenger satisfaction on bus drivers as part four of the whole item. It analyses the passengers' satisfaction with the bus driver, clothes, behavior, skill, speed, comfort, unlimited stops, old people's seats, comfortable due to skill. It can be analyzed using Figure (4.2) and Table (4.5). According to the descriptive analysis, passengers' satisfaction with bus drivers can be represented by the frequency and percentage of questions concerning the bus driver's attitudes.

Figure (4.2) Passengers' Satisfaction on Bus Drivers



Source: Survey Data (July, 2022)

Table (4.5) Overall Satisfaction on Bus Drivers

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Drivers' cloth	6 3.8%	35 21.9%	65 40.6%	51 31.9%	3 1.9%	3.06	.874
2	Behavior	9 5.6%	42 26.3%	78 48.8%	28 17.5%	3 1.9%	2.84	.846
3	Skill	3 1.9%	8 5.0%	40 25.0%	98 61.3%	11 6.9%	3.66	.760
4	Speed	7 4.4%	43 26.9%	52 32.5%	53 33.1%	5 3.1%	3.04	.951
5	Safety	7 4.4%	35 21.9%	62 38.8%	52 32.5%	4 2.5%	3.07	.905
6	Comfortable	8 5.0%	41 25.6%	76 47.5%	31 19.4%	4 2.5%	2.89	.861
7	Unlimited stop	12 7.5%	60 37.5%	26 16.3%	57 35.6%	5 3.1%	2.89	1.073
8	Old peoples' seat	6 3.8%	30 18.8%	38 23.8%	72 45.0%	14 8.8%	3.36	1.006
9	Comfort due to skill	9 5.6%	38 23.8%	49 30.6%	57 35.6%	7 4.4%	3.09	.996
	Overall mean						**3.10**	

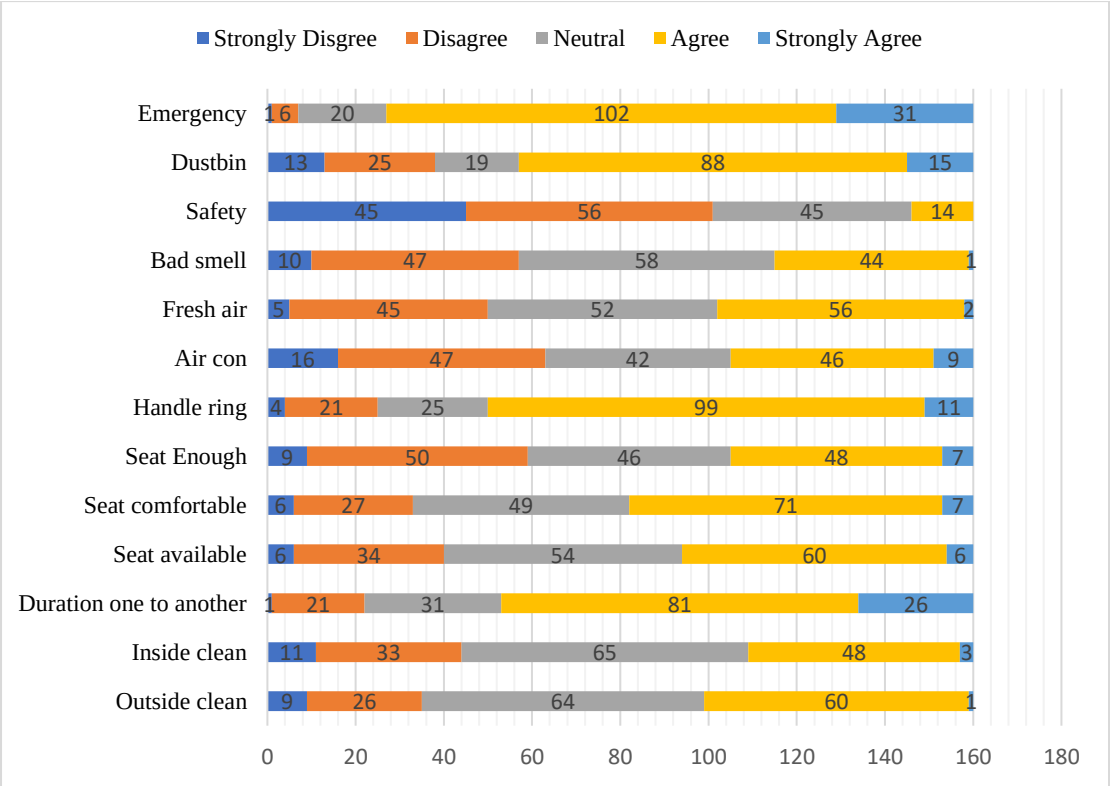
Source: Survey Data (July, 2022)

According to table (4.5), driver behavior and comfort during driving are not satisfied. Unlimited stops are good behavior for a driver who stays within the rules. Other items are nearly satisfied. The associated mean of all driver service attributes demonstrated that customers were neither dissatisfied nor satisfied with service quality in public bus transport (M = 3.0). Table 4.5 summarizes the distribution of responses. The mean of overall satisfaction also indicates that customers are neutral with public bus transport (M=3.10) on bus drivers. The role of a driver is an important part of serving safely and improving public bus transportation. If the passenger and driver have a better relationship, the passenger satisfaction level for public bus transportation will be satisfied. People who travel by bus benefit from greater convenience, dependability, and safety.

4.4.3 Passengers' Satisfaction for Bus

Descriptive analysis presents passenger satisfaction on buses as part five of the whole item. It analyses the passengers' satisfaction on the bus, outside clean, inside clean, duration from one bus to another, available seat, comfortable seat, space inside the bus enough, handle ring, aircon, fresh air, bad smell, safety, dustbin, and emergency instrument. It can be analyzed through Figure (4.3) and Table (4.6). According to the descriptive analysis, passengers' satisfaction with bus drivers can be represented by the frequency and percentage of questions concerning the bus driver's attitudes.

Figure (4.3) Overall Satisfaction on Buses



Source: Survey Data (July, 2022)

Table (4.6) Overall Satisfaction for Bus

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Outside clean of bus	9 5.6%	26 16.3%	64 40.0%	60 37.5%	1 .6%	3.11	.883
2	Inside clean of bus	11 6.9%	33 20.6%	65 40.6%	48 30.0%	3 1.9%	2.99	.928
3	Duration one to another bus	1 .6%	21 13.1%	31 19.4%	81 50.6%	26 16.3%	3.69	.919
4	Seat available	6 3.8%	34 21.3%	54 33.8%	60 37.5%	6 3.8%	3.16	.931
5	Seat comfortable	6 3.8%	27 16.9%	49 30.6%	71 44.4%	7 4.4%	3.29	.927
6	Space inside the bus enough	9 5.6%	50 31.3%	46 28.7%	48 30.0%	7 4.4%	2.96	1.009
7	Handle ring	4 2.5%	21 13.1%	25 15.6%	99 61.9%	11 6.9%	3.58	.894
8	Air con	16 10.0%	47 29.4%	42 26.3%	46 28.7%	9 5.6%	2.91	1.098
9	Fresh air	5 3.1%	45 28.1%	52 32.5%	56 35.0%	2 1.3%	3.03	.900
10	Bad smell	10 6.3%	47 29.4%	58 36.3%	44 27.5%	1 .6%	2.87	.912
11	Safety	45 28.1%	56 35.0%	45 28.1%	14 8.8%	- -	2.17	.942
12	Dustbin in bus	13 8.1%	25 15.6%	19 11.9%	88 55.0%	15 9.4%	3.42	1.113
13	Emergency Tools	1 .6%	6 3.8%	20 12.5%	102 63.7%	31 19.4%	3.98	.726
	Overall mean						**3.17**	

Source: Survey Data (July, 2022)

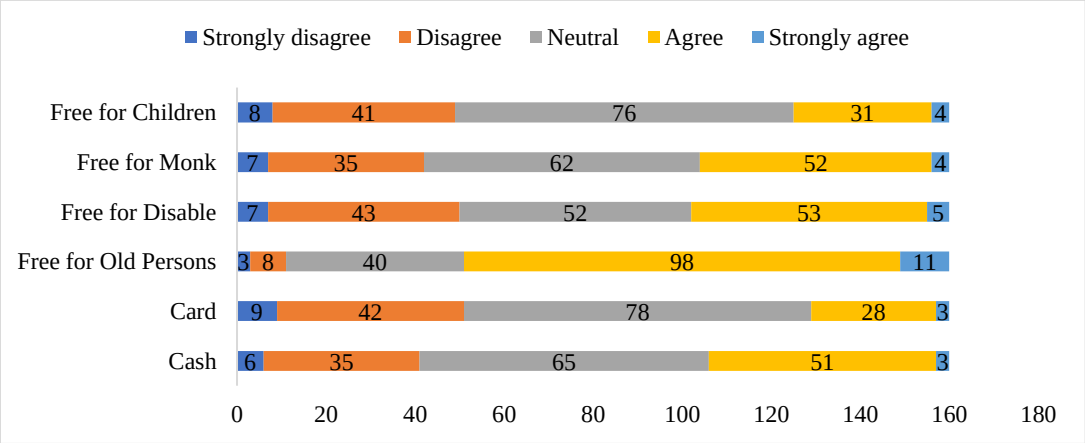
According to Table (4.6), the respondents' answers are that space inside the bus is enough, air conditioning, bad smell, inside the bus clean and safety are not satisfied. Outside the bus clean, seats are available and comfortable, the handle ring, fresh air and dustbin are nearly satisfied. Duration from one bus to another is accepted. People are pleased with the emergency tools. Customers were neutral with the level of services offered by public bus transportation, which related means for all bus service indicators (M = 3.0). Table 4.8 indicates how the responses were divided. According to the overall satisfaction mean (M = 3.17), customers' attitudes toward using public transportation by bus are neutral.

Public bus services are the main factor in public bus transportation. If a country has good bus services, the social economy of the people in that country can be improved effectively. If there are good bus services, people will use the bus more and more instead of private cars, and it will reduce tariff congestion, air pollution, and fuel consumption. Therefore, the state should focus on improving transportation activities, which are mainly relied on for economic activities

4.4.4 Passengers' Satisfaction for Payment System

Descriptive analysis presents passenger satisfaction on bus payment system as part six of the whole item. It examines passenger satisfaction with payment systems such as cash, card, free for the elderly, free for the disabled, free for monks, and free for children. It can be analyzed by using Figure (4.4) and Table (4.7). According to the descriptive analysis, passengers' satisfaction with the bus payment system can be represented by the frequency and percentage of questions concerning the bus's attitudes.

Figure (4.4) Passengers' Satisfaction on Payment System



Source: Survey Data (July, 2022)

Table (4.7) Overall Satisfaction of Payment System

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Cash	3 1.9%	18 11.3%	23 14.4%	102 63.7%	14 8.8%	3.66	.861
2	Card	1 .6%	14 8.8%	52 32.5%	79 49.4%	14 8.8%	3.57	.798
3	Free for old persons	17 10.6%	36 22.5%	34 21.3%	54 33.8%	19 11.9%	3.14	1.205
4	Free for disables	13 8.1%	26 16.3%	37 23.1%	64 40.0%	20 12.5%	3.32	1.136
5	Free for monk	12 7.5%	5 3.1%	24 15.0%	89 55.6%	30 18.8%	3.75	1.040
6	Free for children	13 8.1%	18 11.3%	32 20.0%	75 46.9%	22 13.8%	3.47	1.115
	Overall mean						**3.49**	

Source: Survey Data (July, 2022)

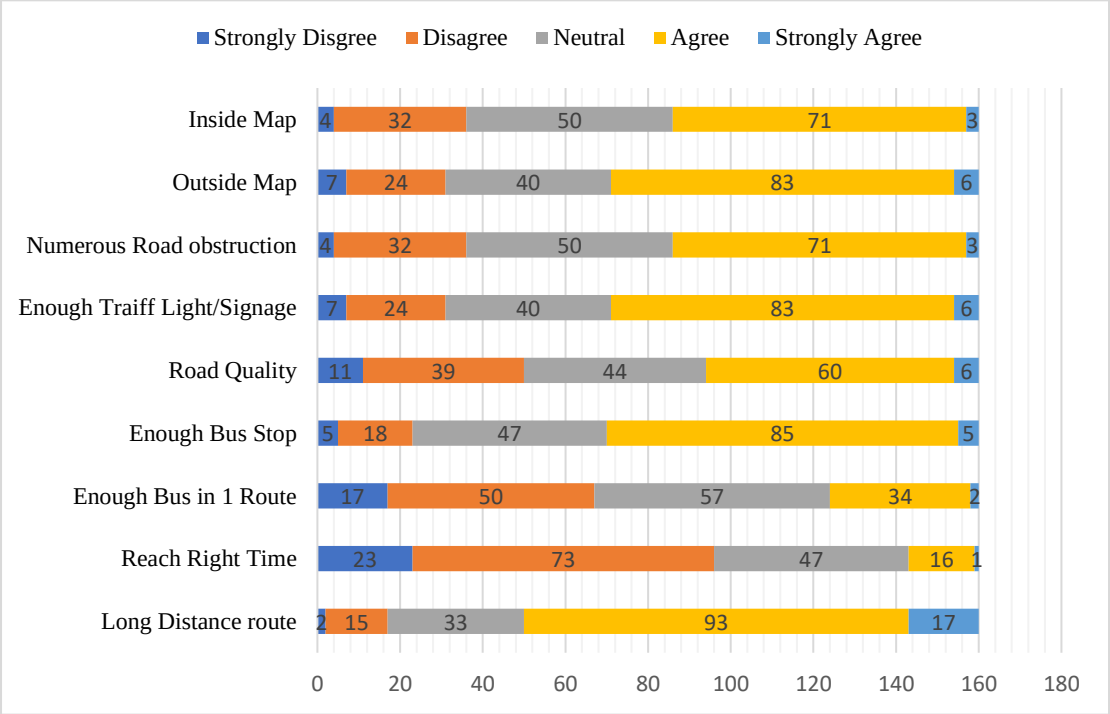
Table (4.7) shows the means and quantity of 160 respondents on payment systems, such as cash, card, free for old people, free for disabled people, free for monks, and free for children. Customers were satisfied with the bus payment system offered by public bus transportation, which related items' means for all payment indicators (M≥ 3.0). Table 4.7 indicates how the responses were divided. According to the overall mean (M =3.5), customers' attitudes toward using public transportation by bus payment system are satisfied.

As Myanmar is a developing country, cash is mostly used for transactions and payments. There are a few people who use cards, but most people use cash. Any payment system is convenient for bus users. According to Myanmar's traditional and cultural beliefs, citizens are religious and kind, allowing monks, pregnant women, children, elderly people, and the disabled to ride the bus for free. Such behavior is a respectable culture in Myanmar.

4.4.5 Passengers' Satisfaction for Bus Routes

Descriptive analysis presents passenger satisfaction on bus routes as part seven of the whole item. It analyses the passengers' satisfaction on bus routes, the distance of the route, reaching the right time, frequency enough on one route, enough bus stops on one route, road quality, enough tariff light/signaling, numerous road obstructions, and outside and inside bus route information. It can be analyzed through Figure (4.5) and Table (4.8). According to the descriptive analysis, passengers' satisfaction on bus routes can be represented by the frequency and percentage of questions concerning the bus's attitudes.

Figure (4.5) Passengers' Satisfaction on Bus Routes



Source: Survey Data (July, 2022)

Table (4.8) Overall Satisfaction of Bus Routes

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
1	Long distance route	2 1.3%	15 9.4%	33 20.6%	93 58.1%	17 10.6%	3.68	.836
2	Reach right time	23 14.4%	73 45.6%	47 29.4%	16 10.0%	1 .6%	2.37	.873
3	Enough number of buses in one route	17 10.6%	50 31.3%	57 35.6%	34 21.3%	2 1.3%	2.71	.961
4	Enough bus stop	5 3.1%	18 11.3%	47 29.4%	85 53.1%	5 3.1%	3.42	.850
5	Road quality	11 6.9%	39 24.4%	44 27.5%	60 37.5%	6 3.8%	3.52	.785
6	Enough tariff light/ signage	7 4.4%	24 15.0%	40 25.0%	83 51.9%	6 3.8%	3.36	.934
7	Numerous road obstruction	11 6.9%	39 24.4%	44 27.5%	60 37.5%	6 3.8%	3.23	.878
8	Outside map	7 4.4%	24 15.0%	40 25.0%	83 51.9%	6 3.8%	3.36	.934
9	Inside map	4 2.5%	32 20.0%	50 31.3%	71 44.4%	3 1.9%	3.23	.878
	Overall mean						**3.21**	

Source: Survey Data (July, 2022)

According to table (4.8), the means and quantity of the respondents, such as distance of the route, enough bus stops on one route, road quality, enough tariff light/signaling, numerous road obstructions, and outside and inside bus route information are satisfied. The right time and frequency on one route are not met. Customers were neutral with the bus routes offered by public bus transportation, which related items means for all mean indicators (M = 3.0). Table 4.8 indicates how the responses were divided. According to the overall mean (M = 3.21), customers' attitudes toward using public transportation by bus routes are neutral. The quality of roads and the network are the lifeblood of public bus transportation. If the number of bus passengers and the number of buses is sufficient, it may be possible to operate

comfortably. In order to avoid traffic, sufficient traffic lights and crosswalks should be provided in crowded areas and intersections.

4.5 Overall Passengers' Satisfaction on Yangon Bus Services (YBS)

This research describes the overall passenger satisfaction of Yangon Bus Services (YBS) in Yangon City. Each variable shows traveler respondents' mean score.

Table (4.9) Overall Passengers' Satisfaction on Yangon Bus Services (YBS)

No.	Description	Mean Score
1	Passenger satisfaction on Bus Stop	3.06
2	Passenger satisfaction on Bus Driver	3.10
3	Passenger satisfaction on Bus	3.17
4	Passenger satisfaction on Payment System	3.49
5	Passenger satisfaction on Bus Routes	3.21
	Overall satisfaction on YBS	**3.27**

Source: Survey data (July, 2020)

Table (4.9) shows the overall passengers' satisfaction of public bus systems such as Yangon Bus Services (YBS). Passengers' responses indicate neutral satisfaction with bus stops (mean = 3.06), bus drivers (mean = 3.10), buses (mean = 3.17) and bus routes (mean = 3.21).

Bus payment systems (mean = 3.49) are assumed to be nearly satisfied. Overall satisfaction with Yangon Bus Services (YBS) in Yangon city is M = 3.27, indicating that customers are either satisfied or dissatisfied (neutral). This condition is that the passengers using the bus daily may not be satisfied. So, the Yangon Bus System (YBS) should change to provide a better public bus transportation system for the public in Yangon City.

4.6 Correlation Analysis of Passengers' Satisfaction on Yangon Bus Services (YBS)

An analysis of correlation shows the relationship between two or more variables. The strength of the relationship between two variables can be determined using Pearson's correlation coefficient, which has a range of values from -1 to +1 inclusive. The positive sign showed that the two variables are positively correlated, and

the negative sign means they are negatively correlated. The correlation coefficient's greater value indicates that there is a strong correlation between two variables. The results of the overall satisfaction factor correlation coefficients are shown in the table (4.10).

Table (4.10) Correlation Analysis of Passengers' Overall Satisfaction on YBS

No.	Factors	Correlation Coefficient
1	Passenger satisfaction on Bus Stop	.630**
2	Passenger satisfaction on Bus Driver	.689**
3	Passenger satisfaction on Bus	.576**
4	Passenger satisfaction on Payment System	.830**
5	Passenger satisfaction on Bus Routes	.600**

Source: Survey data (July, 2020)

(**correlation is significant at the 0.01 level (2 tailed))

Table (4.9) shows the Pearson correlation and is significant at the 0.01 level. According to the correlation analysis in SPSS, the result indicates that overall satisfaction and all variables are positively correlated. Overall satisfaction and bus are moderately correlated at 0.576 and their correlation is statistically significant. Bus stops, bus drivers, and bus routes are strongly correlated with overall satisfaction at 0.630, 0.689 and 0.600 and their correlation is statistically significant. Overall satisfaction and the bus payment system have a very strong correlation at 0.830.

CHAPTER V
CONCLUSION

5.1 Findings

Yangon is the commercial city in Myanmar. It is the best place to do any trade with foreign countries. Yangon City is a focal point for foreign trade rather than domestic trade. Yangon has more employment opportunities than other cities because it can use land, waterways, and air for trade. A good transportation system is also essential for the convenience of commerce. A good transport system not only improves the economy but also contributes to the improving social life of the country. The transportation system is essential, and the public bus system needs to be improved so that people can go to their desired destinations daily. People from the countryside migrated to Yangon and began working. Therefore, Yangon has become a densely populated city.

It focused on public bus transportation in Yangon City, especially Yangon Bus Services (YBS), and analyzed the passenger satisfaction of Yangon Bus Services (YBS). A sample of 160 respondents was asked from Yangon University of Economics in the Western District. Seven questions were asked about the overall satisfaction of YBS passengers with bus transport. Types of questionaries are used in the Five-Point-Likert-Scale for satisfaction analysis. The use of methods is descriptive, including statistics, reliability, satisfaction, and correlation analysis. The questionaries' parts one and two involve the demographic profile and travel pattern of passengers. Another five parts of questions are used to measure satisfaction with the YBS. This study describes the passengers' satisfaction with using public bus transportation and aims to have a better quality of bus service for the daily bus user in the future.

This study shows that bus user satisfaction is needed to improve bus transportation and provide a better system for reform. This research found that the highest percentage of respondents were 64.4% of females and 35.6% of males. The age group is between 21 and 35 (74.4%), who have used public bus transportation in Yangon City, especially those who live in the Western District. The respondents were

mainly students and public servants, with 44.4% and 53.8%. 63.1% are educated people, and 26.3% are university students. 71.3% of the population earns between 2000 and 400000 kyats.

At traveler pattern, commuters use at least two or three bus lines for a trip. Passengers can't just take one bus to get to where they want to go. Take the bus one step at a time. There are difficulties, such as waiting for the next bus. Most of the respondents are students and workers who use the bus to go to school and work in daily routine. Thus, they can face traffic jams during rush hours and spend their personal time on the bus. According to research, most people use the internet, from friends and phone applications to get information, and the view of bus users is that public bus rides are cheaper and more suitable for daily use as public transport.

Passengers' satisfaction decisions were measured using five items for this research. At the five factors, commuters' satisfaction with YBS, such as bus stops, bus drivers, buses, payment systems, and bus routes, is neutral, meaning that people are neither satisfied nor dissatisfied with using the bus transport. To make public bus services (YBS) a good system for society, everyone should actively participate in improvement activities such as research.

Regarding bus stops' nine items, this study found that passengers' overall satisfaction is most neutral. Travelers are satisfied with having a dustbin at bus stops. There is no satisfaction in cleanliness, seat condition, standard and maintenance, all-season convenience, and safety at bus stops. The environment of a bus stop is an important factor for passengers' health and safety. As a result, bus stops are one of the factors influencing passenger satisfaction with public bus services (YBS).

Regarding bus drivers' nine items, this study found that overall passenger satisfaction was the most neutral. Passengers are satisfied due to full driving skills. Dissatisfaction with the lack of behavior and the comfort of the bus drivers. Drivers have to drive according to the set rules, so they should not stop and pick up passengers at other places except at the bus stop. If the drivers and passengers have a good relationship, the passengers can travel to their destination safely and have confidence in the driver. As a result, bus drivers are one of the factors influencing passenger satisfaction on public bus services (YBS).

Regarding the buses' thirteen items, this study found that overall passenger satisfaction was the most neutral. Passengers are satisfied with the handle ring and emergency tools on the bus. Dissatisfaction with buses' interior cleanliness, insufficient

interior space, air conditioning, a bad odor, unsafe conditions, and long wait times between buses. Buses are the main item for all bus users. Buses are reliable; cleanliness, comfort, and security are essential. As a result, buses are one of the most important factors influencing passenger satisfaction with public bus services (YBS).

Regarding the bus payment systems' six items, this study found that overall passenger satisfaction is satisfactory. Passengers are satisfied with cash, cards, free for monks and free for children. Any payments, such as card and cash payment systems, are processed in Myanmar. As a result, the bus payment system is one of the factors influencing passenger satisfaction with public bus services (YBS).

Regarding the bus routes' nine items, this study found that overall passenger satisfaction was the most neutral. Passengers are satisfied with road quality. Dissatisfaction with late arrivals and a lack of buses on a single route. An adequate number of bus routes and operating buses will reduce waiting time for passengers. As a result, bus routes are one of the most important factors influencing passenger satisfaction with public bus services (YBS).

Factors affecting passengers' satisfaction are important for good public bus services. According to the summarized results, passengers are most neutral about overall factors. In developing a good transportation system, it was found that the actions of the bus transport authorities are important as well as the public's opinion on the bus services. Therefore, people should actively participate in the transport and the investigation.

Correlation analysis shows the relationship between two or more variables. Using Pearson's correlation coefficient, the positive sign showed that the two variables are positively correlated, and the negative sign meant they are negatively correlated. The correlation coefficient's greater value indicates that there is a strong correlation between two variables. The result indicates that overall satisfaction and all variables are positively correlated. Overall satisfaction and all variables are correlated and statistically significant. The bus is moderately correlated and the payment systems are very strongly correlated. Overall satisfaction with Yangon Bus Services (YBS) is strongly correlated with bus stops, bus drivers, and bus routes.

5.2 Suggestions

According to the result and finding of the study, passengers' satisfaction with Yangon Bus Services (YBS) should be improved to provide commuters with better bus service quality. Since trade, business, and communication are all essential for society to develop, public bus transportation is important. Planning effectively can control traffic flows, enabling continuous and steady transit between different locations. People who use public bus transport have access to work, community resources, healthcare, and recreational options in their areas, as well as mobility. Better bus service quality will save people time and money on commuting. The residents who live in Yangon face traffic congestion, air pollution, inadequate parking, noise, and wastage of time. These problems can be solved by developing a better transport system.

With 160 respondents, this study measured overall passenger satisfaction on the bus transportation system as well as five related factors. The results show how many need to be implemented for better bus transportation systems. Good bus stops are located with safety and cleanliness. They play a vital role in increasing the satisfaction of bus riders and customers. Cooperation to clean the station environment, adherence to rules and maintenance lead to well-developed bus stops.

Drivers should pay attention to the safety of their passengers. The elderly and disabled passengers only start driving after taking seats. The driver avoids speaking harshly to passengers or speeding. Drivers should patiently answer passengers' questions about the route. The driver is also seen driving with many passengers packed in. When driving a bus, they compete with each other. Driving above the speed limit should be effectively penalized. When using YBS, the safety of people's lives depends entirely on the driver.

On the bus, in addition to the cleanliness of the inside and outside of the buses, the condition of the air conditioner and the bad should be taken into consideration. Buses in Yangon have many situations that are not reliable for bus users. There are many crimes, such as robbery on buses and harassment of women. The driver is also seen driving with many passengers packed in. As the relevant departments should take effective action against the perpetrators of such crimes, the drivers and the traveling public should also help each other.

As Myanmar is a developing country, both cash and card systems are used in the payment system. Usually, when using the bus, cash system users are more frequent than card users. Cash users face the most cashback problems. In addition, there are

difficulties for drivers in paying higher fares than the fixed rates. Card users find it more convenient than cash users. In addition, it can also be reduced from ragas that can be transmitted through money.

Since Yangon is a densely populated city, the number of buses needed to travel around is also necessary. Buses should run regularly enough to avoid overcrowding during peak hours. There are not enough buses running on the same route, so the waiting time is too long. Buses do not run on time, so there is a long wait.

For final suggestion, the difficulties faced by Yangon Bus Services (YBS) users are crowded rides during peak hours, road blocks, bad air conditioning, a lot of waiting for the bus and having to ride step-by-step to get to the destination. For the YBS system to become a better bus system in the future, Yangon Bus Services (YBS) authorities should address the system's needs and try to improve the quality and maintenance of the buses. This study was compiled with the aim of making a better bus system in the future.

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Appendix (1) Current YBS Companies and Bus Line List in Yangon City

No.	Companies	Bus Lines No.	City Buses	Mini Buses	Total Buses
1	YUPT Public Co. Ltd	No.2	30	-	30
		No.3	25	-	25
		No.110	25	-	25
		No.4	111	-	111
		No.7	43	-	43
		No.111	91	-	91
		No.112	45	-	45
		No.113	30	-	30
		No.8	25	11	36
		No.10	30	18	48
		No.11	26	24	50
		No.15	50	-	50
		No.17	36	24	60
		No.24	30	-	30
		No.114	20	-	20
		No.26	35	-	35
		No.28	30	-	30
		No.29	105	-	105
		No.36	40	-	40
		No.115	24	-	24
		No.116	50	-	50
		No.40	61	-	61
		No.58	35	-	35
		No.59	35	10	45
		No.65	60	-	60
		No.84	-	28	28
	Total Buses	**26**	**1207**		
2	YBPC Co. Ltd	No.37	60	-	60
		No.104	50	-	50
		No.105	50	-	50
		No.106	30	-	30
		No.107	50	-	50
		No.43	40	-	40
		No.62	45	-	45
		No.72	40	-	40
		No.87	44	-	44
		No.108	16	-	16
		No.88	50	-	50
		No.89	90	-	90
		No.96	40	-	40
		No.109	10	-	10
	Total Buses	**14**	**615**		

No.	Companies	Bus Lines No.	City Buses	Mini Buses	Total Buses
3	Bandula Public Company Limited	No.12	39	-	39
		No.13	32	-	32
		No.14	41	-	41
		No.25	39	-	39
		No.117	28	-	28
		No.30	36	-	36
		No.38	31	-	31
		No.55	38	-	38
		No.128	30	-	30
	Total Buses	**9**	**314**		
4	Luuhtu Matesway Public Company Limited	No.32	50	-	50
		No.78	50	-	50
		No.93	55	-	55
		No.94	50	-	50
		No.97	30	-	30
		No.118	30	-	30
	Total Buses	**6**	**265**		
5	Omni Focus General Services Public Co.Ltd	No.20	60	-	60
		No.56	30	-	30
		No.82	65	-	65
		No.83	71	-	71
		No.98	42	-	42
		No.99	55	-	55
		No.101	27	-	27
		Airport	30	-	30
		Airport	20	-	20
	Total Buses	**9**	**400**		
6	KhitThit Bayintnaung Public Co. Ltd	No.15	8	17	25
		No.18	-	22	22
		No.21	152	-	152
		No.35	91	-	91
		No.52	-	22	22
		No.53	-	44	44
		No.54	-	13	13
		No.61	109	-	109
		No.68	10	17	27
		No.69	-	18	18
		No.75	-	24	24
	Total Buses	**11**	**547**		
7	ShweTaung Paing Transport Public Co. Ltd	No.5	24	-	24
		No.33	-	41	41
		No.34	68	2	70
		No.51	-	-	-
		No.70	36	-	36
		No.95	45	-	45
	Total Buses	**7**	**216**		

No.	Companies	Bus Lines No.	City Buses	Mini Buses	Total Buses
8	KongBaung Yangon Public Co.Ltd	No.31	137	-	137
		No.64	57	-	57
	Total Buses	**2**	**194**		
9	Amyintmyatsone Power Group Public Transport Co.Ltd	No.6	78	-	78
		No.125	-	-	-
		No.46	-	5	5
		No.92	-	54	54
	Total Buses	**4**	**137**		
10	Power Eleven Public Co. Ltd	No.21	48	-	48
		No.39	58	-	58
		No.41	57	58	115
	Total Buses	**3**	**221**		
11	North Yangon Titegyithar Public Co. Ltd	No.90	49	-	49
		No.122	2	-	2
		No.123	25	24	49
		No.124	2	-	2
	Total Buses	**4**	**102**		
12	Shwelankhing Public Co. Ltd	No.40	71	-	71
	Total Buses	**1**	**71**		
13	GYCT Public Co. Ltd	No.1	33	6	39
		No.9	-	33	33
		No.16	26	4	30
		No.119	43	-	43
		No.19	63	-	63
		No.23	70	-	70
		No.39	-	-	-
		No.57	27	-	27
		No.60	25	10	35
		No.100	28	-	28
		No.102	35	-	35
		No.103	40	-	40
	Total Buses	**12**	**443**		
14	RCBT Public Co. Ltd	No.44	12	7	19
		No.66	40	-	40
		No.67	-	11	11
		No.71	20	31	51
		No.73	-	9	9
		No.74	6	17	23
		No.77	3	41	44
		No.79	27	-	27
		No.91	-	41	41
		No.127	4	-	4
	Total Buses	**10**	**269**		

No.	Companies	Bus Lines No.	City Buses	Mini Buses	Total Buses
15	Sanwaila Public Co. Ltd	No.23	46	-	46
	Total Buses	**1**	**46**		
16	Trans Link Public Co. Ltd	No.27	48	-	48
		No.76	25	35	60
		No.79	50	-	50
		No.80	19	-	19
		No.120	-	17	17
		No.81	15	-	15
		No.85	25	-	25
	Total Buses	**7**	**234**		
17	City Liner Public Co. Ltd	No.86	-	11	11
	Total Buses	**1**	**11**		
18	Shwepyitharther Public Co. Ltd	No.42	88	-	88
		No.121	-	32	32
		No.65	102	-	102
	Total Buses	**3**	**222**		
19	Transport Star Public Co. Ltd	No.22	82	-	82
		No.126	-	18	18
	Total Buses	**2**	**100**		
20	Thet Yin Aung Transport Public Co. Ltd	No.33	-	54	54
		No.45	25	-	25
		No.63	-	42	42
	Total Buses	**3**	**121**		
	Total All Buses	**136**	**5735**		

Source: Yangon Region Public Transport Committee YRTC (2022)

Appendix (2) Currently YBS Routes and Distances

No	Bus Line	From	To	Miles
1	1	Hlegu market	Zawana	37.5
2	2	YuZaNa Garden	AungMingalar	16
3	3	YuZaNa Garden	Tamwe-Sule	16
4	4	YuZaNa Garden	Sule (City Hall)	15
5	5	Dangon Seinkkan	Bojoke Aung San Road	13.5
6	6	Dangon Seinkkan	Dangon Ayar Highway	30.75
7	7	KaMaYa (533)	Sule (City Hall)	14.9
8	8	Yoma avenue	Lathar	18
9	9	Dangon Seinkkan	Tamwe	11.5
10	10	Native Village	University of Dangon	17.87
11	11	AungMingalar	Lathar	17
12	12	North Dangon	Sule (City Hall)	13
13	13	Parime	Botahtaung Pagoda	8
14	14	Parime	Thakhin Mya Park	13.7
15	15	University of Dangon	Hlawga	22
16	15	University of Dangon	YTU	19
17	16	Shwe Pauk kan	Dangon Ayar Highway	16
18	17	Shwe Pauk kan	Dangon Ayar Highway	17
19	18	Mingalardon	Tamwe	19
20	19	Shwe Pauk kan	Thakhin Mya Park	18
21	20	Hlaingthayar	Thakhin Mya Park	21
22	21	West Yangon University	KanarLame	20
23	21	West Yangon University	Mawtin	27
24	21	West Yangon University	Lathar	20.4
25	22	West Yangon University	Thakhin Mya Park	22
26	23	WYTU	Thakhin Mya Park	16
27	23	West Yangon University	Thakhin Mya Park	15
28	24	University of Dangon	Botahtaung Pagoda	13
29	25	University of Dangon	Thein Phyu Road	14.9

No	Bus Line	From	To	Miles
30	26	University of Dangon	Botahtaung Pagoda	16.20
31	27	Mental Health Hospital	15ft Bridge	17.5
32	28	University of Dangon	Sule	13.5
32	29	University of Dangon	Tamwe Awine -Sule	14.5
33	30	University of Dangon	Thakhin Mya Park	18.13
34	31	University of East Yangon	Pazundaung	13.7
35	32	Myanmar Maritime University	Htaukkyant	34
36	33	Kyauktan	Workers' Hospital	22
37	33	Kyauktan	KyauktawGyi Pagoda	22
38	34	Khayan	TheinPhyu	46
39	35	Htaukkyant	Mawtin	24
40	36	Shwe Pauk kan	Sule	14.5
41	37	Htaukkyant	ChaukhtatYone (Yangon)	23
42	38	Parime	ThiriMingalar Zayy Thit	9.3
43	39	Shwepyithar	Anoryahtar Road	21.25
44	39	Shwepyithar	MinYeKyawSwar Road	21
45	40	Shwepyithar	Thakhin Mya Park	17.9
46	40	WartaYar Road (2)	Thakhin Mya Park	20
47	41	Hamwbi	Thakhin Mya Park	33
48	42	No. (4) Road and TharduKan industrial Zone	TharKata	42.75
49	43	WarYarLat	Merchant Road (51)	18
50	44	Hlegu	ThiriMingalar Zayy Thit	26
51	45	Hlegu	MinKone Zayy	21.4
52	46	DarPein	Zawana	22
53	51	Khayan	Bago	38
54	52	Hlaingtharyar	Htantapin	8
55	53	Ahlel Yar	Nyaungdon - Ahlel Yar	6
56	54	Hlaingtharyar	Kyansitt Thar road - Hlaingtharyar	6

No	Bus Line	From	To	Miles
57	55	Parime	Thakhin Mya Park	16
58	56	Thakhin Mya Park	YaZaDrititz-ThakhinMya park	5.6
59	57	Thakhin Mya Park	Botahtaung Pagoda - Thakhin Mya Park	6
60	58	Thakhin Mya Park	LinsaDaung- Thakhin Mya Park	5.9
61	59	No. (2) road	HninSeKone Road	16.71
	60	Yuzana Garden city	ThiriMingalar Zayy Thit	16
62	61	West University of Technology	Sule	16
63	62	University of Dagon	HantharWady (time city)	17
64	63	Kyauktan	LinSaDaung	12
65	64	Waibagi (University of Medical)	Pansodan	15
66	65	Hlawga	Botahtaung Pagoda	28
67	65	Shwepyithar	Botahtaung Pagoda	25.5
68	66	Mental Health Hospital	University of Computer	23
69	67	Ahlel Yar	Yangon-Pethein-Ahlel Yar	14
70	68	Shwepyithar	West Yangon University	20
71	69	Shwepyithar	HlaingtharYar	18
72	70	ThiLawar Housing	Merchant road	23
73	71	LayDoungKam	Zawana	20
74	72	Thakata	Sule (city Hall)	28
75	73	Shwepyithar	Htaukkyant	19
76	74	Shwepyithar (81)	HlaingtharYar (Dagon Ayar Highway)	18
77	75	ThuWana	NatsinLam	12.4
78	76	ThiLaWar(6)	MinDaMa Road	20
79	77	Shwepyithar	Shwedagon pagoda	22
80	78	Shwepyithar	Yangon Railway Station	19
81	79	West Yangon University	LinSaDaung	26

No	Bus Line	From	To	Miles
82	79	West Yangon University	KanarLam	29.12
83	80	Dagon SateKan	Kungyangon	12.5
84	81	Public Housing for Rent Project	Merchant Road	16.13
85	82	Dagon Ayar Highway	ThaKaTa	23
86	83	Dagon Ayar Highway	ShweLi Road (61)	22.54
87	84	National village	North Dagon	16
88	85	HlaingtharYar	ThaKaTa	25
89	86	HlaingtharYar	Bandoola Bridge	15.2
90	87	University of Dagon	Pyidaungzu Road-Sule	24
91	88	University of Dagon	Danyinkone LamSone	17
92	89	Tharkata	HantharWady (time city)	17
93	90	Taikkyi	Thakhin Mya Park	72
94	91	Taikkyi	KyauktawGyi Pagoda	38
95	92	Htaukkyant	Zawana	20
96	93	West Yangon University	Yangon Railway Station	20
97	94	University of Computer	Yangon Railway Station	19
98	95	Kyauktan	Bahan (3) Road	21.69
99	96	Shwepyithar (Hlawga LamSone)	Tharkata	23
100	97	University of Economics	Htaukkyant	31
101	98	Dagon Ayar Highway	Botahtaung Pagoda	23
102	99	Dagon Ayar Highway	ShweLi housing	19
103	100	Dagon Taung	KanarLam daung	14
104	101	University of Technology	University of Economics	28
105	102	Dagon Satekan	University of Dangon	20
106	103	South Dangon	Dagon Ayar Highway	22
107	104	WarYarLat	Yangon ChaukhtatYong	23
108	105	Hmawbi (TU)	Yangon ChaukhtatYong	33
109	106	Okkan	Yangon ChaukhtatYong	140
110	107	Hlawga	Yangon ChaukhtatYong	31

No	Bus Line	From	To	Miles
111	108	University of Dagon	UWisarYa Road-Sule	16
112	109	Hmawbi (TU)	Tharkata	31
113	110	YuZaNa Garden	ThuWaNa-Sule	16
114	110	Dogon Taung	ThuWaNa-Sule	16
115	111	Dogon Taung	Sule (City Hall)	16.55
116	112	West Jisu	Sule (City Hall)	18
117	113	Ngamoeyeik Car Gyi Gate	Sule (City Hall)	8.1
118	114	YaYaKa	Botahtaung Pagoda	14.11
119	115	AungMingalar Highway	Sule	12.5
120	116	Htaukkyant	Sule	20.9
121	117	University of Dangon	Thakhin Mya Park	18.1
122	118	University of Economics	Yangon Rail Station	20
123	119	AungMingalar Highway	DaAyar Highway	22
124	120	ThaKaTa	AungSan football Stadium	8
125	121	No. (4) Road and TharduKan industrial Zone	Dagon Ayar Highway	20
126	122	ChinKone	Thakhin Mya Park	61
127	123	Ahpyauk	Insein	33.5
128	124	Ahpyauk	Insein	33.5
129	125	Dagon SateKam	Dagon Ayar Highway	28.25
130	126	West Yangon University	KyauktawGyi Pagoda	13.5
131	127	Veterans housing- Sanpya Zayy	Mental Health Hospital-Veterans housing	28.13
132	128	University of Dangon	Thakhin Mya Park	17.6
133	-	Airport	Pyay Road- GabarAye Pagoda- Airport	22.8
134	-	Airport	Aungmingalar -DagonAyar Highway- Airport	26.25
135	-	Tontay	Dala	18
136	-	Tontay	West Yangon University	40

Source: Yangon Region Public Transport Committee YRTC (2022)

Appendix (3) Bus Lines List Using the Yangon Payment System (YPS) Card

No.	Bus Lines	Travel Plan
1	No.2	Yuzana Garden – Aungmingalar Highway
2	No.3	Yuzana Garden – Sule
3	No.4	HninSi Housing - Sule
4	No.6	South Dagon – Hlaingtharyar
5	No.7	Akyawtal- Sule
6	No.8	Yoma Guest House - Lathar
7	No.10	University of Dagon - Tharkayta
8	No.11	Aungmingalar Highway - Lathar
9	No.12	South Dagon – Sule
10	No.13	Parime – Botahtaung Pagoda
11	No.14	Parime – Thakhinmya Park
12	No. 23	West Yangon Technological University - Thakhinmya Park
13	No.24	University of Dagon - Sule
14	No.25	University of Dagon – Mingalar Market
15	No.28	University of Dagon - Sule
16	No.29	Shwepokekan - Sule
17	No.30	University of Dagon - Tharkayta
18	No.32	Htaukkyant - Myanmar Maritime University
19	No.36	Shwepokekan – Sule
20	No.37	Htaukkyant - Sule
21	No.38	Parime – Tharimingalar market
22	No.40	Shwepyithar – Thakhinmya Park
23	No.43	Waryarlat – Botahtaung Pagoda
24	No.55	Parime – Thakhinmya Park
25	No.57	Thakhinmya Park - Linsadaung
26	No.58	Thakhinmya Park – Thakhinmya Park
27	No.59	South Dangon – Hninsikone
28	No.60	South Dangon – Tharimingalar New Market
29	No.62	University of Dagon - Kyeemyindaing
30	No.63	Kyaukon- Linsadaung

No.	Bus Lines	Travel Plan
31	No.65	Shwepyithar – Botahtaung Pagoda
32	No.72	Ayarwon – Sule
33	No.78	Yangon Rail station – University of Computer (Yangon)
34	No.87	University of Dagon - Sule
35	No.88	University of Dagon - Pyitawthar
36	No.89	Ayarwon – Panpingyi
37	No.93	Yangon Rail station – West University of Yangon
38	No.94	Yangon Rail station – University of Computer (Yangon)
39	No.96	Hlawga - Thakayta
40	No.97	Htaukkyant – Yangon University of Economics
41	No.104	Waryarlat – Sule
42	No.105	University of Technological (Hmawbi) - Sule
43	No.106	Oakkan - Sule
44	No.107	Hleku – Sule
45	No.110	Yuzana Garden - Sule
46	No.112	Yoma Geust House – Sule
47	No.113	Cargyi Gate – Sule
48	No.115	Aungmingalar Highway – Sule
49	No.116	Htaukkyant - Sule
50	No.117	University of Dagon – Thakhinmya Park
51	No.118	Yangon Raily Station – Yangon University of Economics

Source: The Globel New Light of Myanmar (January, 2022)