EXPECTATIONS OF PEOPLE TOWARDS MAHANAKORN UNDERGROUND TRAIN

by

Ms. Varaporn Tanweenukul

A Final Report of the Three-Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
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Name	Ms. Varaporn Tanweenukul
Project Advisor	Asst.Prof.Dr. Boonmark Sirinaovakul
Academic Year	November 2001

The Graduate School of Assumption University has approved this final report of the three-credit course. CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

Approval Committee:

_____
(Asst.Prof.Dr. Boonmark Sirinaovakul)
Advisor

_____
(Prof.Dr. Srisakdi Charmonman)
Chairman

_____
(Dr. Chamnong Jungthirapanich)
Dean and Co-advisor

_____
(Assoc.Prof. Somchai Thayarnyong)
MUA Representative

November 2001

ABSTRACT

The research study is profitable for the Metropolitan Rapid Transit Authority (MRTA) who undertakes the first of its kind of underground train in Thailand. The main purpose is to show the factors that influence the Bangkok people and those who live in the suburb areas regarding their decision in choosing this mode of transportation and their expectations towards its service and facilities.

MRTA can use this study as a guide of service provision to the passengers in order to meet their needs. People will get the advantages of this new alternative way of transportation such as the fastness, the good service and the convenience as well as the reduction in traffic congestion and pollution.

The research is concentrated on Bangkok males and females aged 13 years and more. The experiment is done in the downtown areas and the 380 questionnaires are returned out of 400.

SPSS program accomplished the evaluation. The results of the evaluation suggest that the numbers of routes, the fastness and the fare rate is the most important factor for people in choosing Mahanakorn underground train as their transportation.

ACKNOWLEDGEMENTS

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I. INTRODUCTION

1.1 Introduction

Thailand is counted to be one of the developing countries. Many kinds of technologies have been developed and transferred from the developed countries so that, the new and advanced products and services emerged everyday in Thailand. Mahanakorn underground train is the first underground train system that is currently on progress. The traffic problem is a major problem that all Bangkok people face with everyday. With the increasing rate of cars purchased in Bangkok, it is rising the traffic pollution that affects the quality of life and health. The current transportation system seems to be insufficient and needs some improvement in service to serve the passengers. Consequently, Mahanakorn underground train is expected to be an alternative way of transportation to Bangkok people.

Mahanakorn underground train is the first underground train system in Thailand. Thai people never use this mode of transportation in travelling to their desired destinations. At present, they do not have sufficient information about Mahanakorn sub-train.

Mahanakorn underground train is a revolutionary way of transportation in Bangkok. The Bangkok passengers have more alternative ways of traveling to work, to schools, to university and somewhere else. Mahanakorn underground train can bring the passengers to the destinations with much less spending time than by buses, by trains, by boats and by cars. Mahanakorn underground train does not enhance the pollution. On the contrary, it helps reduce the pollution if people leave their cars and come to use the service of this underground train. It helps reduce air pollution, noise pollution as well as vision pollution on the roads. With the expansion of Mahanakorn underground

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train, more and more passengers are eager to use and gain its service. Traveling by Mahanakorn underground train is easy, convenient, fast going, safe and not expensive for the Bangkok passengers.

Bangkok people have felt excited to have and use this Mahanakorn underground train for years. Understanding the actual passengers' expectation about service and facilities will be very interesting and beneficial to both the readers and the organization involved. This study will lead to further improvement and development in order to better response to the passengers' needs in Bangkok and can be brought to further consideration for the sky-train service throughout Thailand.

1.2 Background of the Study

Mahanakorn underground train project is a very new technology of transportation in Thailand even though it exists abundantly in the developed countries for a long time ago. At present, Mahanakorn underground train project is on progress and expected to be ready to give the service in B.E. 2545. Thai people, especially people who live in Bangkok, have dreamt of and been eager to use it. It gains interest from the Bangkok people who try and choose it as an alternative way of transportation. The researcher also feels interested in this Mahanakorn project and would like to identify and indicate the actual expectation of the passengers towards its service and facilities. That is the reason why the researcher chooses to study this research topic.

1.3 Scope

The study is carried out to find out the expectation of the passengers towards Mahanakorn underground train service and facilities prior to their use the actual service.

The questionnaires are designed to evaluate passengers' needs and analyze their expectation that will be conducted in Bangkok. The experiment will be done in the main business areas and where there are many crowds of people that are Silom Road,

Siam-square Center, Victory monument and Ramkhamhaeng Road. The group of study will be concentrated on Bangkok males and females aged 13 and more years. The sample size of this study is 400 people.

1.4 Objectives

This research tries to identify and indicate the actual expectation and feelings of the passengers towards Mahanakorn underground train service and facilities prior to their actual use. The objectives of this project on Mahanakorn underground train are:

(1) To give an overview of Mahanakorn underground train services and facilities provided.

(2) To analyze the passengers' expectations and feelings towards its services and facilities.

(3) To evaluate the expectations of the passengers towards Mahanakorn underground train.

(4) To gain the passenger's point of views and their suggestions that will lead to the improvement of better services and facilities.

1.5 Importance of the Study

After the readers read through this study, they would receive the overview knowledge about Mahanakorn underground train project; its services and facilities provided to the passengers. They will understand the passengers' expectation, what kind of service they really need and hope from Mahanakorn underground train at the present.

The evaluation and recommendation gained from this study is beneficial to the Metropolitan Rapid Transit Authority and the organizations concerned. This study explains what kind of services and facilities that the passengers need, their suggestion and recommendation. Metropolitan Rapid Transit Authority and the

organizations concerned will get the actual point of view for further improvement of their services and facilities to gain its maximum utilization. It will lead to further improvement and development of sub-train in other areas of Thailand in the future.

1.6 Statement of the Problem

The statement of the problem of this study is:

(a) The expectation of the passengers who will use the Mahanakorn underground train in the following issues:

  (1) What are the most range of time traveling between home and workplace or education institutes that people tend to go out?

  (2) Will the people decide to choose Mahanakorn underground train as their alternative way of transportation?

  (3) What are the service and facilities people decide to choose from Mahanakorn underground train provided along the underground station? The answer of the problem will fulfill the management of Mahanakorn underground train to design the strategy, service, and facilities to meet the need of the passengers.

II.   LITERATURE REVIEW

2.1   Background of the Metropolitan Rapid Transit Authority of Thailand

The Metropolitan Rapid Transit Authority of Thailand (MRTA) is founded under the Act of the Metropolitan Rapid Transit of Thailand 2000, which was announced in the Government Gazette on 1 December 2000 and became active on 2 December 2000.

The MRTA is previously known as the Metropolitan Rapid Transit, which was founded under the royal decree of 1992 and was effective on 21 August 1992. It aims to keep the mass transit system in Bangkok and the metropolitan in order by constructing or providing the subway transit system, and managing or providing other services related to the subway system for the benefit of the MRTA and its transit system.

The Act also allowed the MRTA to determine several actions, for examples, "the subway safe zone" to effectively take care of the underground tunnels and the constructions. They are also allowed to set up the "subway zone" to support the passengers and the overall subway system. More over, the MRTA is permitted to earn profits from the other means apart from the tickets fares; and to develop their estates accordingly for the benefits of the passengers. They are authorized to perform the function in Bangkok, the metropolitan and in other provinces as the Royal Decree would permit.

The Metropolitan Rapid Transit Authority (MRTA) has been entrusted with the responsibility of implementing the first underground mass transit project ever undertaken in this country.   It is something that all the people of Thailand, not only those living in Bangkok, can be proud of and derive benefit from, both directly and indirectly.

2.2 MRTA Network Planning

MRTA is expediting the implementation of the Initial System Project Blue Line for completion and partial operation in late 2002. As for the Blue Line Extension and the Orange Line Project, MRTA has modified the overall plan, delaying the implementation in line with Thailand's economic downturn. The implementation plan for the four mass rapid transit system projects in Bangkok and the suburbs with an approximate combined total route length of 81 kilometers is as follows:

(1) The MRTA Initial System Project, 20 km. long, Hua Lamphong – Queen Sirikit National Convention Center – Bang Sue (the Blue Line)

Year 1995-1999:	Land acquisition
Year 1996-2003:	Detailed design and construction
Late 2002:	Partial service commencement
Late 2003:	Full service commencement

(2) The Blue Line Extension North Section, 12 km. long, from Bang Sue to Phra Nangklao Bridge.

Year 1999-2003:	Land acquisition
Year 2002-2005:	Detailed design and construction
Late 2006:	Service commencement

(3) The Blue Line Extension South Section, 14 km. long, from Hua Lamphong to Bang Khae.

Year 1999-2003:	Land acquisition
Year 2002-2007:	Detailed design and construction
Late 2007:	Service commencement

(4) The Orange Line, 35 km. long, from Bang Kapi to Rat Burana.

Year 1999-2005:	Land acquisition

Year 2002-2009: Detailed design and construction

Late 2008: Partial service commencement

Late 2010: Full service commencement

2.3 The MRTA Initial System Project: Hua Lamphong – Queen Sirikit National Convention Center – Bang Sue (the Blue Line)

The Hua Lamphong – Queen Sirikit National Convention Center- Bang Sue, or the Blue Line, will be Thailand's first underground mass rapid transit line. The Cabinet passed a resolution on 12th September 1995 giving approval for MRTA to implement the project as a wholly underground route using the design and build concept. MRTA is to invest in the civil works and the private sector is to invest in the rolling stock system and operation. Revenue service is targeted to commence in late 2002.

Land Acquisition

(a) Land acquisition along the route.

Hua Lamphong – Huai Khwang Section: MRTA has already handed over all the land to the contractor for construction.

Huai Khwang – Bang Sue Section: MRTA has handed over 69.64% of the land to the contractor for construction.

(b) Land acquisition for the Depot

The Expressway and Rapid Transit Authority of Thailand (ETA), responsible for land acquisition for the Depot, had acquired 77.95% of the land. Expropriation of the remaining land has been facilitated by the Property Expropriation Act 1996. This work is currently in the process of compensation to the owners and transfer of land titles to MRTA.

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2.4 Mission, Objectives and Vision

Mission

"To provide the efficient, modern and standard mass transit system in Bangkok and the metropolitan to reduce the traffic problems and traffic jams for the better life quality and the cleaner environment."

Objectives

(1) To proceed the Mass Rapid Transit Charloem Rajamongkala route and open partially (Huay Khwang-Bangsue section) in 2002 and the entire route in 2003.

(2) To extend the subway network following the Bangkok and Metropolitan Mass Transit model scheme.

(3) To minimize the investing burden of the governmental sectors by allowing the private sectors to the participate the investment and servicing.

(4) To provide the convenient, fast, safe, stable and effective mass transit services in order to encourage the people to use system as much as possible.

(5) To reduce the traffic jam and other traffic malfunctions.

(6) To improve the quality of people's standard of living and the environment.

Vision

"To be the leading organization who provides one of the best mass transit system in Asia."

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2.5   The MRTA Policies

The study of the Blue Line area including the development and the design of facilities is the co-projects between the MRTA and other mass transit systems in order to develop the area around the Sky Train station effectively and appropriately. The MRTA has destined the project to be studied and completed within February 2002.

The project objectives of the 2001 fiscal year are:

(1)   To proceed and complete the model scheme and the principle plans.

(2)   To complete the bus routes modification.

(3)   To design the features and complete 50% of the entire work body.

The MRTA expects to bring the study result to assist in constructing the Blue Line route, to improve the bus routes and to guide the area development around the route.

The maintenance and renovation center area development model scheme is to utilize the 1,000-Rai land and to develop it commercially for the following objectives:

(1)   To proceed and complete the study and the model scheme within November 2000.

(2)   To proceed in accordant to the study.

The expecting result from the project is to maintain the model scheme as a frame and guideline to develop and utilize the maintenance and renovation area, as well as the usefulness of the developed area after Thailand had the new government led by the excellency Lt. Gen. Taksin Shinawatra on 17 February 2001. On 26 February 2001 the new cabinet has stated to the Parliament the policies that relate to the MRTA's development as followed:

(1) The Communication Policy

   (a) To support the development of the basic communication and transportation network on the basis of production cooperation, jobs opportunity and income generation.

   (b) To improve and develop the mass transit system and the national communication networks for the better linkage which will provide the convenient, fast and safe transport systems.

(2) Bangkok Development Policy

   (a) To improve the mass transit system networks efficiently, to encourage the quality service of the mass transit system and to connect the public utility constructions to be consistent with the development of the urban development and town plan.

2.6 The Plan of Operation of the 2001 Fiscal Year

The Chaloem Rajamonkala Route Project's 2001 plans are:

(1) To complete 98% of the entire design of the tunnel and the southern underground station (Hua Lampong-Huaykwang section).

(2) To complete 94% of the entire design of the tunnel and the northern underground station (Huay Kwang-Bangsue section).

(3) To proceed the design and complete 95% of the maintenance and renovation center construction.

(4) To proceed the design and complete 76% of the tracks.

(5) To proceed the design and complete 67% of the elevators and escalators.

The result of the tasks showed that there will be around 404,880 passengers/day (within 2003) and that the system will reduce the 17,000 million bahts loss caused by traffic jams per year.

The Blue Line Hua Lamphong-Bangkhae section is the project that will support and expand the service of the Raja Mangkala route as designed in the model scheme to decrease the number of a personal car usage from the suburban areas into the city centers. The route from Hua Lamphong to Bang Wa is aimed to open in 2008 and the entire route in 2010.

MRTA's 2001 Fiscal year objectives are:

(1) To proceed for the approval from the cabinet.

(2) To issue the land ownership royal decree.

(3) To select the consultants, the contractor and the concession.

The expecting results of the project are the estimated figures of 207,330 passengers/day (within 2004), which will reduce the 8,600 million bahts loss caused by traffic jams.

2.7 Project Specifications

(1) Total Route

Hua-Lamphong-Samyan-Silom-Queen Sirikit National Convention Center-Asoke-Huai Kwang-Suthisan-Lad Prao-Mochit Station-Bang Su Railway Station.

(2) Total Route Length

20 Kilometers approximately.

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(3) Station

18 stations, along with centered-platforms, sided-platforms and intervention platform at the length of 200 Meters and 23 Meters in width (a standard station), and also platform screen door.

(4) Park and Ride for Passengers

Lad Prao Parking Lot as provided (car park capacity: more than 2,000 cars).

(5) Rail System

Heavy Rail with an air-conditioner carriage (3.2 Meters in width and 19-23 Meters in length; 320 passengers/carriage). The train consists of 3 or 6 carriages, with speed capacity less than 80 km./hr.

(6) Service Provided

They come every 5 minutes during rush hour.

They come every 10 minutes outside rush hour.

(7) Average Speed: 35 km./hr.

(8) Service Hour: 5AM.-12PM.

(9) Fee System

Automatic System (can use with other transportation systems). The rate varies according to the route taken.

(10) Accommodations

We provide our passengers with lift, escalator, kiosk, and handicapped accommodation in each station.

(11) Cooperation with other means of transport

To provide our passengers with fast efficiency, convenience and safety, MRTA planned to have a provision of MRT Inter-modal Transfer. Our projects are as follows:

An interchange facilities with BTS sky train at Silom, Asoke and Mochit Stations, along with an interchange ticket.

An interchange facility by providing bus bay at the main stations: Queen Sirikit National Center, Khampaeng Phet, and bus station at passenger car park. Besides, we have 2,000 cars park and ride at Lad Prao and Khampaeng Phet stations.

Moreover, MRTA is carrying out a study on route facilities such as, to improve bus routes and to guide the area development around the route, and also a center for cooperating various transportation systems.

2.8 Project Values and Investment Pattern

MRTA project, Charloem Rajamongkala, has 108,628 million bahts expenditures (excluded interests occurred during construction period and value added taxes) which we can divide into:

Table 2.1. The Expenditures of the MRTA Project.

Land Acquisition	24,479	Million Bahts
Consultant, Study, Design and Management Expenditures	3,096	Million Bahts
Design & Construction in Civil Engineering and Public Consultant	63,635	Million Bahts
Mechanical & Electrical System Expenditures	17,418	Million Bahts
Total	**108,628**	**Million Bahts**

Remarks: *the values shall vary on the private sector's proposal, excluded interests occur during construction period and expenditures occur before any implementation shall start.

(1)   Return on Investment

A study on the return on investment of the project, which is carried out by IFCT, showed that we shall receive 428,457 million bahts of return on investment in time saving and reduction in transportation expense for 25 years, the whole period of concession. It means that we yield 11.32% in economic internal rate of return (EIRR). The benefits are concluded as follows:

Table 2.2.   Time-saving on Transportation.

Year 2003	4,397 Million Bahts/Year
Year 2007	27,772 Million Bahts/Year
For the whole concession period	386,766 Million Bahts

Table 2.3.   Reduction in Vehicle Expenses.

Year 2003	824 Million Bahts/Year
Year 2007	2,174 Million Bahts/Year
For the whole concession period	41,691 Million Bahts

(2)   Internal Rate of Return on Equity

An analysis of internal rate of return on equity, which is carried out by IFCT, showed that the private sector which is a 25 year-concessionaire, shall yield approximately 15% internal rate of return on equity, and MRTA

shall yield approximately 4.4% approximately internal rate of return on equity.

2.9 Progression of Charloem Rajamongkala Route

Total progress: 69.38% (73.44% as expected). According to the contract, we can divide into 6 groups:

The 1st Contract: Design and Construction of Underground Structures – South (Hua Lamphong – Rama IX), the route length is 10 Km. along with 9 stations.

Work Progress: 89.71% (90.64% as expected)

The 2nd Contract: Design and Construction of Underground Structures – North (Tiem Ruam Mitr - Bang Sue), the route lengths is 10 Km. along with 9 stations.

Work Progress: 83.19% (84.71% as expected)

The 3rd Contract: Contract an Electronic Carriage Maintenance Center at Huai Khwang with the area of 300 rai approximately.

Work Progress: 99.39% (99.89 as expected)

The 4th Contract: Design, Supply and Installation of Track work

Work Progress: 70.19% (76.94% as expected)

The 5th Contract: Design and Installation of Lift and Escalator for all 18 stations

Work Progress: 72.78% (67.76% as expected)

The 6th Contract: Selection of a Concessionaire to Co-invest in the M&E Equipment and Operation of the MRT System

Work Progress: 6.50% (21.44% as expected)

Smart Card: The Hi-Tech Card for Skytrain Passengers

Recently the smart card has been used to increase quality in services and reduce cost in selling the skytrain passenger cards. In addition, passengers don't have to bring

the passenger cards from the bag and then swipe any more. More conveniently, with the smart cards they only bring the card near the card reader and enter.

Singapore's public transportation system, for example, will use smart card technology soon. By the end of year 2001 smart cards will be used at every sky train and bus stations. With these cards the passengers can enter the sky train doors or get on the buses without stopping to insert the card into the card reader. They just bring the smart cards near the card reader about 1-5 centimeter and then enter the doors.

The new way of passenger tickets will not raise the ticket price at all. Moreover, this is going to be a huge saving for the investor in a long term. The smart cards will reach the end of their lives in 5 years, compared to the 2 years of the traditional passenger tickets with magnetic stripe. With smart cards the the passengers will move through the door faster as this new systems take only 0.1 second to read one card. It is expected that the passengers can pass the card reader 35 persons/minute. (This rate is at 25 persons/minute at present). Change in ticket system will also bring in more capacities to link the sky train to other systems of public transportation in the future.

2.10 Disaster Prevention and Safety

Measures in Preventing Fire

(1) Fire Extinguishing Measures

The main objectives of these measures are to extinguish fire and to facilitate the people to escape as fast as possible and be safe. The measures include automatic fire alarm system and the system for public announcement for emergency directions.

(2) Fire Prevention Measures

The objective is to reduce the risk of fire, and if it happens then make it limited one. This can be achieved by defining features, properties and

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form of the building. They use the inflamable material and produce little smoke when burned. They provide enough and simple stairways to escape fire. In addition to two regular stairways they also have two ventilation shafts in every station of Mahanakorn underground train. If the distance between any two stations were more than one kilometer they would install intervention shaft. For the 20-kilometre distance of the sky train, Chalerm Rajamongkol Line there are 8 intervention shafts between stations.

The measures in preventing fire for the underground train is set according to the international standard called NFPA (National Fire Protection Association), which includes both fire prevention and extinguishing.

(3)   Fire Prevention and Extinguishing

The fire prevention and extinguishing system in every station and in the tunnel includes the following:

(a)   Fire alarm system

(b)   Water spray system

(c)   Water hose system

(d)   Fire extinguisher in tunnel

(e)   Gas-extinguished system

(f)   Portable Fire Extinguisher

(4)   Fire alarm system

The system will sensor smokes or excessive heat to locate the fire correctly and fast. The fire alarm equipment will be installed in the control room of every station. It consists of the smoke sensor equipment, heat sensor equipment, heat equipment and fire extinguish equipment, as may be

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needed by the cases. The sensors will signal to the fire alarm equipment. The officers then inspect to identify what happens and whether those smokes and heat can lead to fire. In case of fire, even such a little opportunity, there will be a ring sound to alert passengers and officers immediately.

(5) Air Spray System

This is the automatic fire extinguishing system with the automatic sprinkler installed in every area, such as retail areas, passenger areas, platforms, and rooms. There is one tank of fire extinguishing liquid on the platform floor and two 1.25 kilowatt electric water pumps and a 0.75 watt control pump in order to regulate water pressure in the hoses.

(6) Water hose system

Three fire extinguishing units will be installed on each stairways of every platform. The water for the fire extinguishing system came from the tang in the same way as the water sprinkler system.

(7) Sprinkler system in the tunnels

There are water systems along two sides of the tunnel from the station, with sprinkler installed every 50 meters. It is also possible to supply water through the water hose at the ventilation shaft between each station.

(8) Gas-extinguished system

This system uses FM200 which is a non CFC gas and will not be dangerous to the ozone atmosphere and safe for living things. The gas-extinguished system will be used in a closed room that can not use other methods of fire extinguishing, such as water or chemical spray. Such area includes:

(a)   Transformer room and all levers;

(b)   Emergency electricity room;

(c)   Telecommunication and signal monitor room;

(d)   Portable fire extinguisher;

Carbondioxide fire extinguisher will be installed in many areas such as:

(a)   Transformer room and all levers;

(b)   Equipment storage room on platform floor;

(c)   Every machine room;

(d)   Train control in the station;

(e)   Communication room;

Measures in Preventing Flood

The design of Mahanakorn Underground Train are based on the statistics of the highest level of flood in the past 200 years. There are also 2 measures in flood prevention, which are:

(1)   Normal flood caused by heavy raining.

Normally in this case the water level will not higher than 0.5 meter from the height of the footpath. To be prevent such water from flowing into the stations and the tunnels, the stairways to and from the stations and the door of the ventilation buildings are built 1.2 meters high above the footpath level. Therefore, the water can not flood in and the train will not be interrupted.

(2)   Seasonal flood

As for seasonal flood the highest of water level is 2.5 meters above sea level---the highest level in the past 200 years---or approximately 1.7 meters above the height of the footpath. This level is 0.5 meter higher than the level of the stairways to and from the stations and the doors of the ventilation buildings. In order to prevent water from flooding in we will install the stop logs (1.5 meters height) on the stairways to and from the stations and the doors of the ventilation buildings.

2.11 Singapore's Mass Rapid Transit

The Company's mission is to provide mass rapid transit passenger major high density travel corridors in Singapore in order to satisfy the travelling public for a safe, reliable and user-friendly MRT system with competitive fares. SMRT aims to secure reasonable returns for its shareholders. The Company also strives to provide its staff with opportunities, remuneration and service conditions commensurate community standards and to promote a culture whereby staff will be motivated and loyal.

(1)   General Information

Singapore MRT Ltd. (SMRT), a private company incorporated on August 6th, 1987, is responsible for the operation and maintenance for the Singapore Mass Rapid Transit (or MRT). SMRT is also required to replace their operating assets when deemed necessary. Their mission is to enable mass transportation in major traffic areas to satisfy public travel needs safely and reliably at a competitive fare. Approximately 2,600 people work for SMRT.

Initial groundbreaking was Oct 22nd, 1983, and the first trains started running on November 7th, 1987. The current MRT consists of two lines - an east-west line from Pasir Ris to Boon Lay and a semi-loop from Jurong East to Marina Bay via Woodlands. It was designed to link housing areas with the central business district. Accessing the CBD in Singapore during rush hours by automobile requires a special permit because of traffic congestion, an interesting way that the Singapore government tries to promote the use of rapid transit. The fare structure is zoned with fares ranging from S$0.60 to S$1.80.

The MRT operates every day from 5:30am to 12:30am. Peak periods are Monday to Friday from 8:00 am to 9:00am and 5:15pm to 6:30pm. and Saturdays from 8:15am to 9:00 am and 1:00pm to 2:30pm.

(a)   Stations

There are 48 stations on the MRT system, 15 of which are underground, 32 elevated and one on the surface. All underground stations are air-conditioned and are enclosed by glass-doors similar to those found on the Newark International Airport monorail.

There were two purposes to this - one for safety and the other to save on air conditioning costs. These doors are operated using compressed air and provide a tolerance of +/- 500mm between the train doors and the platform doors. SMRT claims that they open approximately 300 times a day.

(b)   Fare Collection

Access to the system is through the use of fare cards, either single use or through stored value cards called TransitLink farecards.

Single use tickets are retained by the exit gates for recycling. TransitLink cards can be used on both the MRT and the extensive bus system and a rebate of S$0.25 is given when you transfer between 2 buses or from the MRT to a bus and vice versa. The maximum value the fare card holds is S$50.00.

Another type of fare card called the GIRO allows a fare card holder to automatically maximize the value of the card when it runs out. The card has to be swiped through MRT GIRO gates or bus validators. The easiest way to explain this is that it's a rapid transit EZ-Pass, except the money is transferred directly from a user's bank account to SMRT instead of from a credit card.

Reduced fares are offered to young children, students and senior citizens. Fares for children and students are S$0.40 or S$0.50, and for senior citizens, good only during non-rush hours, are S$0.60 orS$0.70.

A souvenir ticket is also offered at a cost of S$6.00 that offers S$5.50 worth of rides. When the value of the ticket is used up, the user can keep the ticket as a souvenir.

(c) Route/Track Distances:

Total route km: 83

Total track km: 234, including depots, sidings and crossovers

Underground: 19km

Elevated: 64km.

(d) Track types:

On viaducts, conventional timber sleepers on stone ballast.

In tunnels, concrete sleepers set in continuous concrete slab.

In tunnels through sensitive areas, floating slab track set in concrete units resting on resilient pads.

(e)   Number of shops: 3

(f)   Trains:

85 trains, usually 6 cars per train, numbered. Interiors are painted different colors. Trains are automatically controlled and the 'train operator' closes the doors at each station. Multiple chimes are heard before the doors close. All stations, transfer announcements and door closing announcements are from an automated, female voice. Passengers can pass between cars without going through doors; passage links are provided. The cars also use regenerative braking returning power to the system.

(g)   Ridership

Weekday: 834,210

Saturday: 928,110

Sundays/holidays: 649,420

(h)   MRT FARES

MRT fares (in cents) for Adult Fare Card, Single Trip Ticket and Child/Student Farecard based on distance travelled are shown in the table below. The fares for Senior Citizen Fare Card remain unchanged.

Table 2.4. MRTA Fares Based on Distance Travelled.

Distance (km)	Adult Farecard		Single Trip Ticket		Child/Student Farecard		Senior Citizen Farecard (Off-peak)	
-	Existing	New	Existing	New	Existing	New	Existing	New
up to 3.2	60	60	70	80	40	40	60	60
3.2 - 4.4	70	70	90	100	40	40	690	60
4.4 - 5.6	80	80	90	100	40	40	60	60
5.6 - 7.2	90	90	110	120	40	45	60	60
7.2 - 8.0	100	100	110	120	40	45	60	60
8.0 - 9.4	105	110	120	120	40	45	60	60
9.4 - 10.4	110	110	120	120	40	45	60	60
10.4 - 12.4	115	120	130	140	40	45	60	60
12.4 - 14.4	120	125	130	140	40	45	60	60
14.4 - 16.5	125	130	140	140	50	50	70	70
16.5 - 18.6	130	135	140	140	50	50	70	70
18.6 - 21.1	135	140	150	160	50	50	70	70
21.1 - 23.6	140	145	150	160	50	50	70	70
23.6 - 26.0	145	150	160	160	50	50	70	70
26.0 - 28.0	150	155	160	180	50	50	70	70
28.0 - 30.0	150	160	160	180	50	50	70	70
Over 30	150	165	160	180	50	50	70	70

(1) Awards & Certification

SMRT has achieved ISO 9002 quality certifications as well as all 11 sections under the Maintenance Division. This certificate is awarded to companies that comply with the internationally recognized ISO 9002 for quality assurance, to ensure consistently high standards of quality working towards Total Quality Management (TQM) for the Company ahead.

(2) Project Value

(a) Turnover

Turnover was S$368.0 million in FY2000 compared with S$352.8 million for FY1999. Passenger revenue in FY2000 was

S$338.7 million or 92.0% of turnover compared with S$325.6 million or 92.3% of turnover in FY1999. SMRT generated the higher passenger revenue, notwithstanding a fare rebate of approximately 5% in effect during the calendar year 1999, which they attribute to passenger ridership growth of 6.1% to 367 million in FY2000 compared with 346 million in FY1999.

Commercial revenue (which comprises advertising revenue and rental revenue) in FY2000 was S$28.0 million or 7.6% of turnover compared with S$27.2 million or 7.7% of turnover in FY1999.

(b)   Operating expenses

Operating expenses comprise staff and related costs, repair and maintenance costs, depreciation expenses (offset by amortization of assets related grant), electricity costs and other operating expenses (which includes property tax).

Total operating expenses in FY200 were $283.1 million or 77.0% of turnover compared with S$271.0 million or 76.8% of turnover in FY1999.

Depreciation of fixed assets was $117.2 million in FY2000 compared with S$123.3 million in FY1999.

(c)   Interest and Investment Income

Interest and investment income in FY2000 was S$75.2 million compared with S$48.5 million in FY1999. The higher income was due to the general recovery in the equity markets.

(d)   Profit after taxation

Profit after taxation in FY2000 was S$115.4 million or 31.4% of turnover compared with S$94.7 million or 6.8% of turnover in FY1999.

The improvement in the profit after tax margin was due to savings in staff costs, lower electricity costs, lower property tax and high levels of interests and investment income.

III. RESEARCH SUMMARY AND ANALYSIS OF SURVEY DATA

3.1 Research Methodology

This survey research involves the Services and Facilities from Mahanakorn Underground Train. Therefore the target group of this survey research will be studied from the general public and focus on students whose ages are 13 years old upwards to working people group as well as the elderlies. Among them are either male or female.

We apply the convenience sampling method for data collection. We will go to the selected main business areas and where there are many crowds of people. Using a Questionnaire System proved this research successfully. The 400 Questionnaires were distributed to various targets such as the walking people on the footpaths, the people along the several transportation terminals, the students from secondary schools up to the university levels, and the proprietors are also targeted.

3.2 Questionnaire Design

The Questionnaire was designed to evaluate passenger expectation and analyze the passenger's attitude towards Mahanakorn underground train. Thus this questionnaire consisted of two parts described as below:

Part I: The awareness of Mahanakorn underground train and the traveling information of general people. It comprises 8 questions.

Part II: The Opinion of general people regarding the factors that affect their decision to choose Mahanakorn underground train as an alternative way to transportation. There are 5 questions in this part.

Part III: The demographic data. There are 8 questions with 2 open-ended questions that asked for specifying their living areas and other suggestions regarding Mahanakorn underground train.

3.3 Determining Sample Size

This study examines the non-probability sampling design because the respondent's chance of being included in the sample is unknown. According to the infinite population, the techniques for determining sample size of statistical inference are based on the relationship among the estimated proportion of customer, the maximum allowance for error between the true proportion and sample proportion, and the confidence level which indicates the long-run probability that the confidence interval estimate will be correct. Thus, the formula is:

$$n = \frac{Z^2pq}{E^2}$$

Where;
n = Sample size

p = Population proportion that has the required characteristics

q = (1-p) estimated proportion of the non-customer to population

E^2 = Allowed errors between the true and sample population

Z^2 = Square of the confidence level in standard error units

Confidence Level

We will apply the 95% confidence level so that the maximum allowance between the true and sample proportion is 5% or 0.05.

Standardized Normal Distribution

A probability distribution that reflects a specific normal curve for the standardized value, Z score, in accordance with the specific confidence level is 1.96.

Estimated Proportion of Customer

As we do not have the characteristics of the population, we divide the proportion of population equally. The result of p is equal to 0.5 and then q is equal to 0.5. Substitution these values into the formula,

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

$$= 384 \text{ respondents.}$$

Therefore, the sample size for this research is 384 units.

400 questionnaires are distributed to collect the data. However, 389 questionnaires are received from the respondents and some of them are excluded because of their incomplete and blank answers. The questionnaires with response errors are excluded so that the analysis is done from the complete questionnaires. After editing process, the 380 questionnaires remain and used for computer coding. The respond rate of 98.96% that is very closed to 100%. Therefore, the sample size is adequate and gives the reliable results enough for this study.

3.4 Data Analysis

The data analysis of the collected questionnaires is done by the SPSS software program. The statistical data used in the tables are: Percentage, Mean, and Standard deviation.

ANOVA is the method of statistical analysis or the strategy used in analyzing the expectations and determining whether there is a significant difference between 3 or more means. The probability level or the alpha is less than 0.05 and the level of confidence is 95%. The test of significance is made at a pre-selected probability level which allows the researcher to state that the null hypothesis is rejected because it would be expected to find a difference as large as it has been found by chance in only 5 out of every 100 studies.

IV. ANALYSIS, INTERPRETATION AND RESEARCH OF FINDING

From the 400 questionnaires distributed to the general people to know their expectation towards the service and facilities from Mahanakorn underground train, 380 questionnaires are returned.

61.80% is female who responds to the research, while 38.20% is male. It is found that male and female are not significantly different in their expectations regarding Mahanakorn underground train. The most range of age of the respondents is between 21-30 years (52.63%).   58.20% of the respondents are receiving or accomplished the Bachelor's degree. 33.90% are the officers. The range of the respondents' income per month is below 10,000 Bahts that is 46.32%.

The highest percentage (31.58%) of the respondents acknowledges or knows about Mahanakorn underground train project fairly; there is only 25.26% who knows about the least. They are aware of Mahanakorn underground train mostly from friends or relatives (37%). They usually travel between home and workplace or education institutes by the private car (45.50%) and by the air-conditioned bus (26.60%). The average traveling expenses of 380 respondents is 72.60 Bahts per day. The range of distance between home and workplace or education institutes is between 5-15 kilometers (35.5%). The largest group of the respondents travels between home and workplace during 07.01-08.00 a.m. and 04.01-05.00 p.m.

59.7% of the respondents accept that they are unsatisfied with the service they usually receive from the public transportation. 67.9% responds that they will certainly try the service from Mahanakorn underground train when it is available.   The routes that cover the respondents' destinations is the first factor that affect their decision to choose Mahanakorn underground train for an alternative way of transportation

(50.50%), fastness (47.40%), the convenience (31.80%), the fare (27.60%), the safety (17.60%), good service from the staffs (8.4%) and the cleanliness (5.50%) respectively.

The factors that affect the respondents' decision not to choose Mahanakorn underground train as their way of transportation are that the routes do not cover or not near their destination (64.50%), the fare is too high (34.50%), the unfamiliarity (20.80%), the inconvenience of using the service (1740%), the safety (16.10%), the other factor (3.70%), and the bad service provided (2.40%) respectively.

In the respondents' opinions, the convenient stores are the first priority of the facilities they prefer. The most expectation of the respondents towards the service and the facilities is the safety.

From the open-ended question asking about the respondents' living area, 35% of those who give the answers mainly live in Charoenkrung road, Ramkhamhaeng road, Sukhumvit road, Charoennakorn road and Charansanitwong road. 29% of all respondents give some suggestions about Mahanakorn underground train that there should be sufficient routes that cover the business areas and suburb areas. 22% of them show their comments that the fare should be low and affordable as this Mahanakorn underground train project is for the mass transit.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The Metropolitan Rapid Transit Authority (MRTA) has been assigned by the government to implement four major sections of mass rapid transit system in Bangkok and the suburbs with an approximate combined total route length of 81 kilometers. MRTA has the responsibility of implementing the first underground mass transit project ever undertaken in Thailand.

According to the summary of questionnaires, 31.58% of all respondents acknowledge and know about Mahanakorn underground train. This percentage is quite small and shows that MRTA needs to provide more information and update the people.

59.70% of the respondents accepts that they are unsatisfied with service they usually receive from the public transportation. Mahanakorn underground train is thus an alternative way they will choose for their transportation especially during the rush hours and the peak business hours. The ranges of time they usually travel between home and workplace or education institutes are 07.01-08.00 a.m. and 04.01-05.00 p.m.

Nowadays, the traffic in Bangkok is very congested and the people do not receive the good service from the available public transportation. If the routes of Mahanakorn underground train cover the desired destinations of the prospect, help them save the time traveling while it is fast, the people will turn to use it as another future option to solve their traveling problems.

Meanwhile, the fact that the routes do not cover or not near the desired destinations of the people also affects their decision not to choose it, the fare is also an another factor. Especially in the economic slow down and there is the increasing number of people who have no job to do.

The average traveling expense per day of the people is 72.60 Bahts for the distance between 5-15 kilometers. This traveling expense rate is the average rate that people are used to receiving the service of transportation and their travel. The fare rate of Mahanakorn underground train when compared with the route and the distance they take can be used for MRTA to take in to the consideration. Then the routes and the fare rate are the very important factors that induce people to use Mahanakorn underground train and can help the traffic jam problem in Bangkok.

Mahanakorn underground train is the first underground train in Thailand, people find it as a new way and new technology of transportation so the safety is the first factor that they consider when they think of the advantage of its fastness.

5.2 Recommendations

Mahanakorn underground train is a great opportunity for Bangkok' transportation but now it is only in the construction stage. A few numbers of people know about its project in details. MRTA should provide more information about the project, its background and its progress to increase the awareness and the knowledge of people. The information should be updated to the general public consistently to promote the future service that it can stimulate the people' eagerness to try.

Mahanakorn underground train is the new technology of transportation in Thailand to reduce the problem of the traffic congestion and its pollution and to increase a new way of transportation for the people who do not have their own car but are seeking the their appropriate way of traveling. When they have more choice of transportation with the fastness that can take them to the desired destinations and with the acceptable fare rate, they would abandon the use of private cars and that can reduce the traffic congestion and pollution.

MRTA should promote free trial of service to the people after the completion of the construction in order to attract people to the new transportation and to reduce the unfamiliarity of using the service.

APPENDIX A

QUESTIONNAIRE

QUESTIONNAIRE

To whom it may concern,

I am a graduate student of Assumption University. Now I am conducting a research on Expectations of People towards Mahanakorn Underground Train, which is in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

Your kind answer will help me in research to understand the Expectation of People towards Mahanakorn Underground Train. Your answer will remain completely anonymous. Thank you for your kind cooperation.

Please mark ☑ in front of the answer you choose.

Part I: The awareness of Mahanakorn underground train and the traveling information of general people.

1. How well do you know about Mahanakorn underground train?

    ❏ None   ❏ Least   ❏ Poor
    ❏ Fair   ❏ Good   ❏ Excellent

2. From which mediums that make you aware of Mahanakorn underground train?

    ❏ Newspaper   ❏ Friends/Relatives   ❏ Leaflet/Poster
    ❏ Television   ❏ Radio   ❏ Public Relations
    ❏ Other (Please specify)...................................

3. Usually, How do you travel between home and work place/educational institute?

    ❏ Walk   ❏ Taxi
    ❏ Private Car   ❏ Train
    ❏ Boat   ❏ BTS Sky Train
    ❏ Micro Bus   ❏ Bus
    ❏ Motor Cycle   ❏ Air-conditioned Bus
    ❏ Other (Please specify)...............................

4. How much is your average travel expense per day between home and work place/educational institute?

    Answer: ....Baht

5. How far is the distance between home and work place/educational institute?

    ❏ Less than 5 km.   ❏ 26-35 km.
    ❏ 5-15 km.   ❏ More Than 35 km.
    ❏ 16-25 km.

6. Normally, What range of time do you travel from home to work place/educational institute?

❐ 04.01-05.00 a.m.	❐ 04.00-05.00 p.m.
❐ 05.01-06.00 a.m.	❐ 05.01-06.00 p.m.
❐ 06.01-07.00 a.m.	❐ 06.01-07.00 p.m.
❐ 07.01-08.00 a.m.	❐ 07.01-08.00 p.m.
❐ 08.01-09.00 a.m.	❐ 08.01-09.00 p.m.
❐ 09.01-10.00 a.m.	❐ 09.01-10.00 p.m.
❐ 10.01-11.00 a.m.	❐ 10.01-11.00 p.m.
❐ 11.01 a.m.-12.00 p.m.	❐ 11.01 p.m.-12.00 a.m.
❐ 12.01-04.00 p.m.	❐ After Midnight to 04.00 a.m.

7. Normally, What range of time do you travel from home to work place/educational institute?

❐ 04.01-05.00 a.m.	❐ 04.00-05.00 p.m.
❐ 05.01-06.00 a.m.	❐ 05.01-06.00 p.m.
❐ 06.01-07.00 a.m.	❐ 06.01-07.00 p.m.
❐ 07.01-08.00 a.m.	❐ 07.01-08.00 p.m.
❐ 08.01-09.00 a.m.	❐ 08.01-09.00 p.m.
❐ 09.01-10.00 a.m.	❐ 09.01-10.00 p.m.
❐ 10.01-11.00 a.m.	❐ 10.01-11.00 p.m.
❐ 11.01 a.m.-12.00 p.m.	❐ 11.01 p.m.-12.00 a.m.
❐ 12.01-04.00 p.m.	❐ After Midnight to 04.00 a.m.

8. Are you currently satisfied with the service you usually received from the public transportation?

   ❐ Satisfied because ....
   ❐ Unsatisfied because ....
   ❐ Never use the service from the public transportation.

Part II: The Opinion of general people regarding the factors that affect their decision to choose Mahanakorn underground train as an alternative way to transportation.

9. Whenever Mahanakorn underground train is available for service, Will you choose it as your alternative way of transportation?

   ❐ I will certainly try its service.
   ❐ Have not decided about it yet/ Not sure
   ❐ Will not try its service because ....

10. Which factors that affect your decision to choose Mahanakorn underground train for your transportation?

❐ Routes cover your destinations	❐ Service
❐ Convenience	❐ Fastness
❐ Cleanliness	❐ Safety
❐ Fare	

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11. Which factors that affect your decision not to choose Mahanakorn underground train for your transportation?

☐ Unfamiliarity   ☐ Convenience
☐ Fare   ☐ Safety
☐ Service   ☐ Routes not cover or near your
☐ Other   destinations
   (Please specify) ....

12. In your opinion, what are the priorities of the facilities you prefer?
(Please rank the priority: 1= Most Important, 8 = Least Important)

☐ Facilities for the disabled   ....
☐ Buses available for the passengers to the underground   ....
   train stations
☐ Parking Lots   ....
☐ Toilettes   ....
☐ Escalators   ....
☐ Elevators   ....
☐ Guideboard/ Signpost   ....
☐ Convenient Stores   ....

13. How much is your expectation towards the service and the facilities you receive from Mahanakorn underground train project?

	Least	Little	Fair	Much	Most
Routes cover your destinations					
Waiting period for each sub-train					
Fare Rate					
Convenience					
Cleanliness					
Service					
Fastness					
Safety					
Arrival and departure on time					

Part III: The demographic data.

1. Gender:

    ❐ Female
    ❐ Male

2. Age:

    ❐ 13 - 20   ❐ 41 - 50
    ❐ 21 - 30   ❐ 51 or more
    ❐ 31 - 40

3. Marital Status
    ❐ Single   ❐ Separate
    ❐ Married   ❐ Widow
    ❐ Divorce

4. Education:

    ❐ Below primary School   ❐ University certificate
    ❐ Primary school   ❐ Bachelor's degree
    ❐ High school   ❐ Graduate
    ❐ Senior high school/ Vocational school

5. Occupation:

    ❐ Student   ❐ Government Official
    ❐ Housewife   ❐ Independence
    ❐ Businessman   ❐ Other (Please specify) ....
    ❐ Proprietor

6. Income per month

    ❐ Below 10,000 Baht   ❐ 30,001-40,000 Baht
    ❐ 10,000-20,000 Baht   ❐ 40,001-50,000 Baht
    ❐ 20,001-30,000 Baht   ❐ Above 50,001 Baht

7. Living area (Please specify): ....

8. Other comments or suggestions: ....

APPENDIX   B

TABLES AND FIGURES

Part III: The demographic data.

Table B.1.   Total Number of Respondents Based on Gender and the Comparison.

Gender	No. of Respondents	Percentage	Mean	Standard Deviation	t-value	2-Tail Probability
Female	235	61.80%	38.0255	4.402	1.53	0.127
Male	145	38.20%	37.3034	4.594	1.51	0.132
Total	**380**	**100%**				
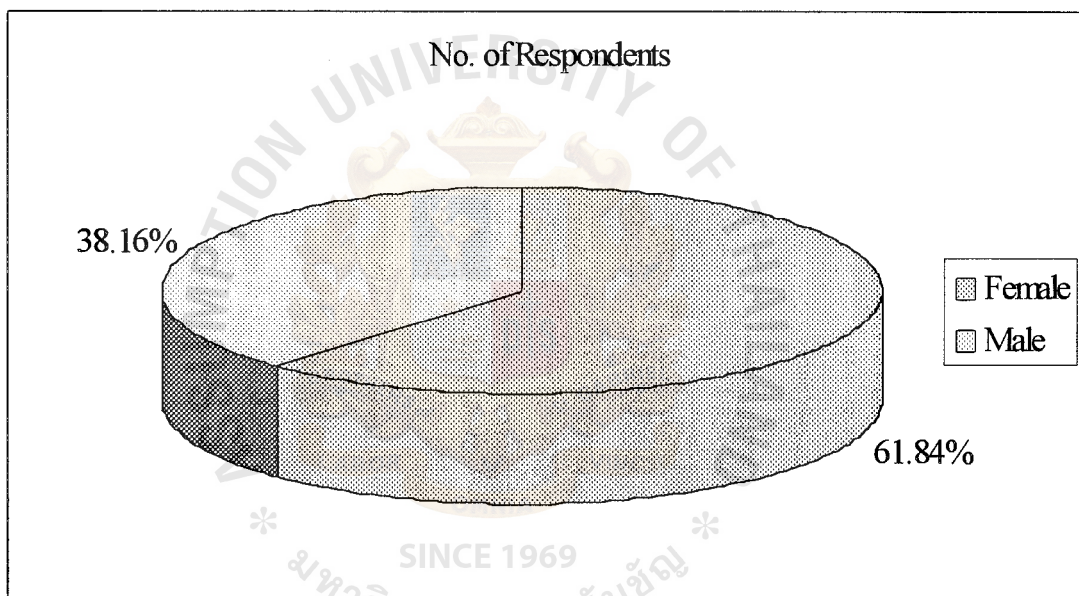
Figure B.1.   Gender of the Respondents.

There are totally 380 respondents in my research, 61.80% is female and 38.20% is male.

From the comparison of the means of two groups of samples according to the expectation of different genders, the different sexes, male and female are not significantly different in their expectations at the 0.50 level.

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Table B.2.   Total Number of Respondents Based on Age.

Age	No. of Respondents	Percentage
13-20	57	15.00%
21-30	200	52.60%
31-40	69	18.20%
41-50	23	6.10%
51 or older	31	8.20%
Total	380	100%
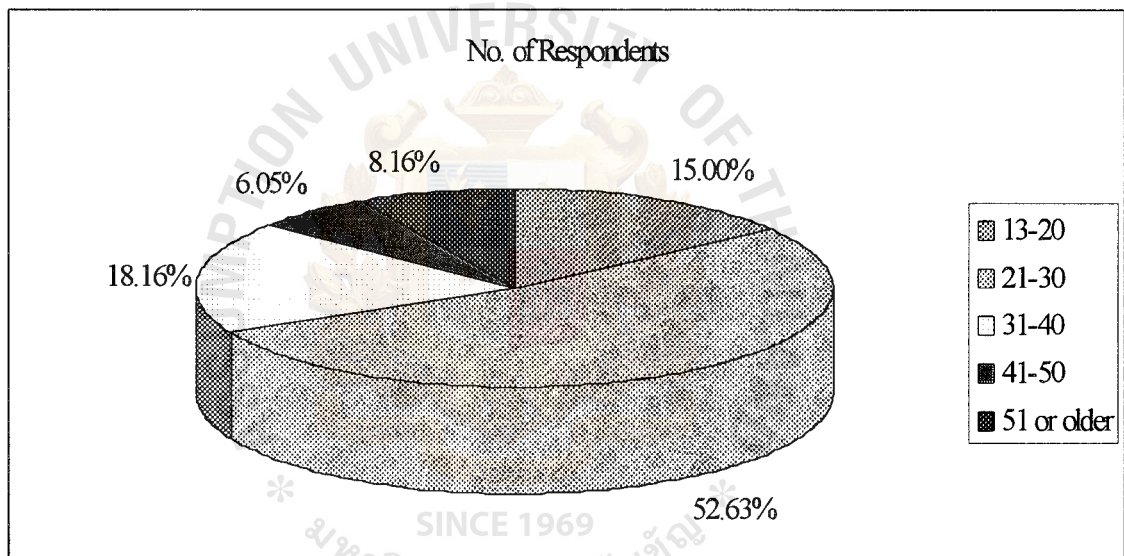
Figure B.2.   Ages of the Respondents.

Total Number of Respondents based on age is as follows:

13 – 20 years is 15.00%, 21 – 30 years is 52.63%, 31 – 40 years is 18.16%

41 – 50 years is 6.05%, and 51 or older is 8.16%.

The highest group of respondents based on age is 21 – 30 years old that shows 52.63%.

Table B.3.   The Comparison of Means of Different Ages.

Source of Variance	d.f.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	4	238.9664	59.7416	3.0492	0.0171
Within Group	374	7327.5824	19.5925		
Total	**378**	**7566.5488**			

From the comparison of means of the expectation from the group of samples that have different ages by using one-way ANOVA method, it is found that the two groups of samples that have different ages are significantly different in their expectations at the 0.05 level.

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Table B.4.   Total Number of Respondents Based on Marital Status.

Marital Status	No. of Respondents	Percentage
Single	259	68.15%
Married	106	27.89%
Divorce	2	0.53%
Separate	4	1.05%
Widow	9	2.38%
Total	**380**	**100.00%**
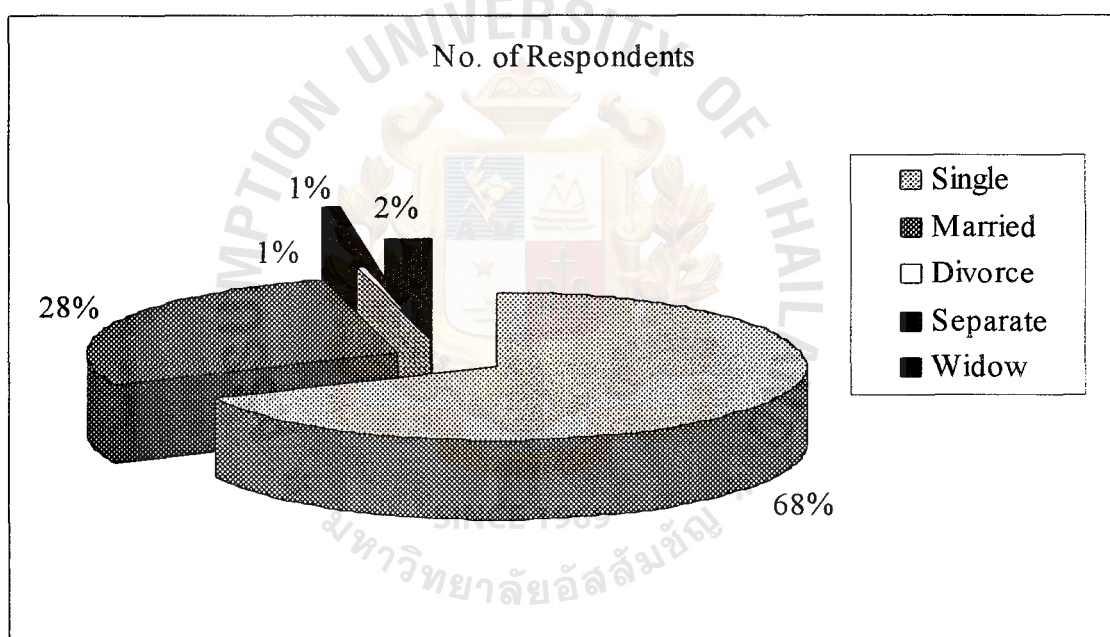
Figure B.3.   Marital Status of the Respondents.

Total Number of Respondents Based on Marital Status is as follows:

Single 68%, Married 28%, Divorce 1%, Separate 1%, and Widow 2%.

The highest group of respondents based on Marital Status is Single (68%).

Table B.5.   The Comparison of Means of Different Marital Status.

Source of Variance	d.f.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	4	81.4771	20.3693	1.0134	0.4003
Within Group	375	7537.7729	20.1007		
Total	**379**	**7619.2500**			

From the comparison of means of the expectation from the group of samples that have different marital status by using one-way ANOVA method, it is found that two groups of samples that have different status are not significantly different in their expectations at the 0.05 level.

Table B.6.   Total Number of Respondents Based on Education.

Education	No. of Respondents	Percentage
Below Primary School	3	0.80%
Primary School	19	5.00%
High School	24	6.30%
Vocational School/ Senior High School	56	14.70%
University Certificate	31	8.20%
Bachelor's degree	221	58.20%
Master's degree or over	26	6.80%
Total	**380**	**100%**
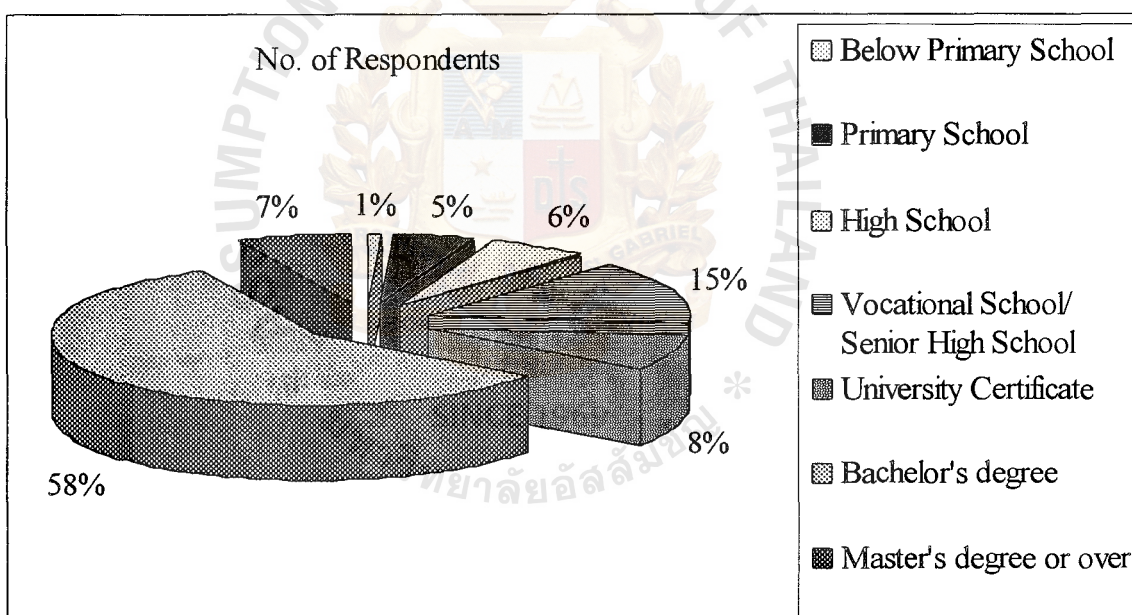
Figure B.4.   Educational Level of the Respondents.

Total Number of Respondents Based on Education: Below Primary School 1%, Primary School 5%, High School 6%, Vocational School/ Senior High School 15%, University Certificate 8%, Bachelor's degree, and Master's degree or over 7%.

The highest group of respondents based on Education is Bachelor's degree (58%).

Table B.7.   The Comparison of Means of Different Educational Level.

Source of Variance	d.f.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	6	252.85	42.1417	2.1339	0.0488
Within Group	373	7366.40	19.7491		
Total	**379**	**7619.25**			

From the comparison of means of the expectation from the group of samples that have different level of education by using one-way ANOVA method, it is found that two groups of samples that have different level of education are significantly different in their expectations at the 0.05 level.

Table B.8.   Total Number of Respondents Based on Occupation.

Occupation	No. of Respondents	Percentage
Student	122	32.10%
Housewife	14	3.70%
Officer	129	33.90%
Proprietor	33	8.70%
Government Official	30	7.90%
Independence	42	11.10%
Others	10	2.60%
Total	**380**	**100.00%**
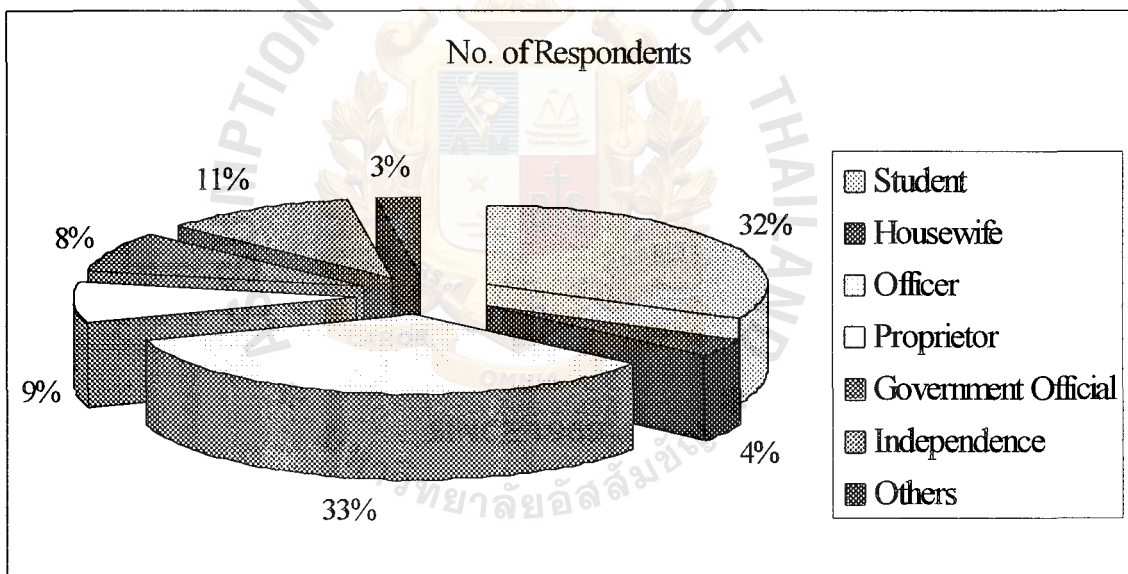
Figure B.5.   Occupation of the Respondents.

Total Number of Respondents Based on Occupation:

Student is 32.10%, Housewife is3.70%, Officer is 33.90%, Proprietor is 8.70%

Government Official is 7.90%, Independence 11.10%, and Others is 2.60%.

The highest group of respondents based on occupation is Businessman (33.90%).

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Table B.9.   The Comparison of Means of the Expectation from the Group of Samples That Have Different Occupation by Using One-way ANOVA Method.

Source of Variance	d.f.	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	6	10.3144	1.7191	0.0846	0.9977
Within Group	373	7608.9356	20.3993		
Total	**379**	**7619.25**			

From the above table, it is found that two groups of samples that have different occupation are not significantly different in their expectations at the 0.05 level.

Table B.10. Total Number of Respondents Based on Income per Month.

Income per Month	No. of Respondents	Percentage
Below 10,000 Bahts	176	46.32%
10,000-20,000 Bahts	125	32.89%
20,001-30,000 Bahts	39	10.26%
30,001-40,000 Bahts	20	5.26%
40,001-50,000 Bahts	9	2.37%
Above 50,000 Bahts	11	2.90%
Total	**380**	**100.00%**
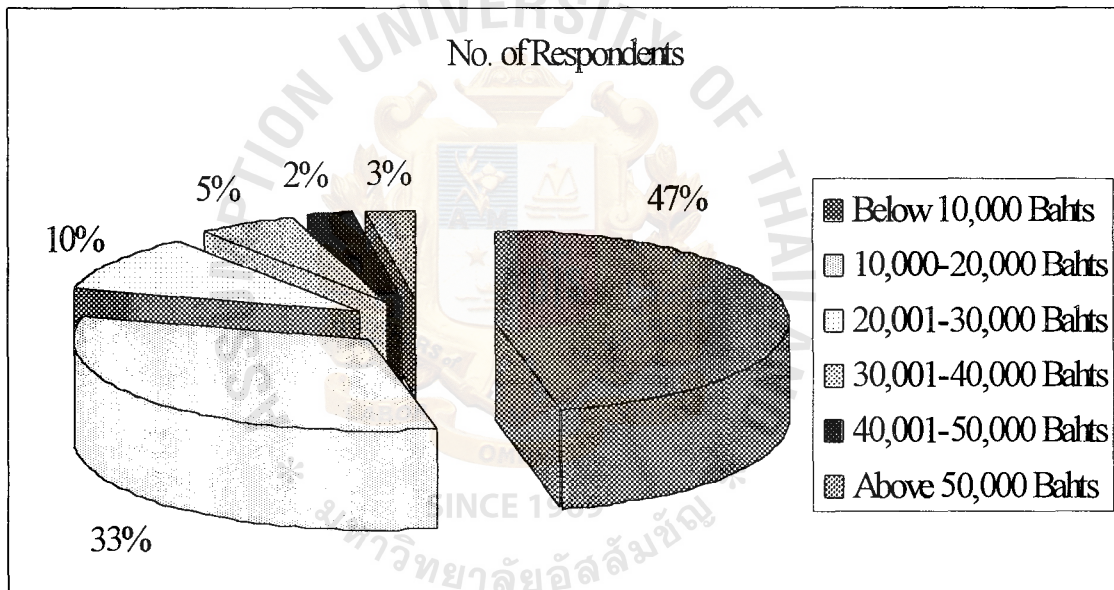
Figure B.6. Level of Income per Month of the Respondents.

Total Number of Respondents Based on Income per Month:

Below 10,000 Bahts is 46.32%, 10,000 - 20,000 Bahts is 32.89%,

20,001 - 30,000 Bahts is 10.26%, 30,0001 – 40,000 Bahts is 5.26%,

40,001 – 50,000 Bahts is 2.37%, and Above 50,000 Bahts is 2.90.

Part I: The awareness of Mahanakorn underground train and the traveling information

of general people.

Table B.11.   Respondents' Acknowledgement about Mahanakorn Underground Train.

Answer	No. of Respondents	Percentage
None	39	10.26%
Least	96	25.26%
Poor	85	22.37%
Fair	120	31.58%
Good	38	10.00%
Excellent	2	0.53%
Total	380	100.00%
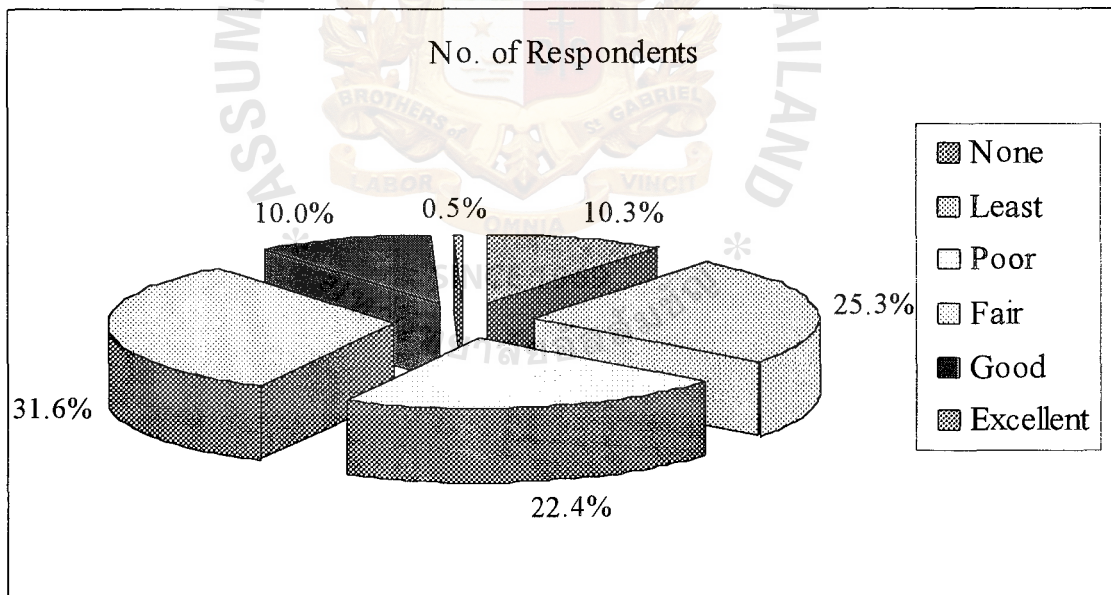
Figure B.7.   Respondents' Acknowledgement about Mahanakorn Underground Train.

Question No. 1 is How well do you know in details or have knowledge about Mahanakorn underground train?

From the table, the highest percentage is 31.58% (Fair), followed by 25.26% (Least), 22.37% (Poor), 10.26% (None), 10.00% (Good), and 0.53% (Excellent).

This question is to measure the acknowledgement of Mahanakorn underground train.

The answer of this question shows that the largest group of respondents is the group knowing in details or have knowledge about Mahanakorn underground train fairly and the least. Therefore, most of the respondents should know in details about Mahanakorn underground train better. However, there are a couple more years for MRTA to do public relations to the people.

Table B.12.   Respondents' Awareness of Mahanakorn Underground Train from Newspapers.

Answer	No. of Respondents	Percentage
Yes	103	27.10%
No	277	72.90%
Total	**380**	**100.00%**

Figure B.8.   Respondents' Awareness from Newspapers.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answers from 380 respondents are presented below:

Yes for 103 from 380 = 27.10%, and

No for 277 from 380 = 72.90%.

The answer indicated that 27.10% of 380 respondents is aware of Mahanakorn underground train from newspaper.

Table B.13. Respondents' Awareness of Mahanakorn Underground Train from Friends or Relatives.

Answer	No. of Respondents	Percentage
Yes	140	36.80%
No	240	63.20%
Total	**380**	**100.00%**

Figure B.9. Respondents' Awareness from Friends or Relatives.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 140 from 380 = 36.8%, and

No for 240 from 380 = 63.20%.

The answer indicated that 36.80% of 380 respondents is aware of Mahanakorn underground train from their friends or relatives.

Table B.14.   Respondents' Awareness of Mahanakorn Underground Train from Leaflets or Posters.

Answer	No. of Respondents	Percentage
No	310	81.60%
Yes	70	18.40%
Total	**380**	**100.00%**

Figure B.10.   Respondents' Awareness from Leaflets or Posters.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 70 from 380 = 18.40%, and

No for 310 from 380 = 81.60%.

The answer indicated that 18.40% of 380 respondents is aware of Mahanakorn underground train from leaflets or posters.

Table B.15.   Respondents' Awareness of Mahanakorn Underground Train from Televisions.

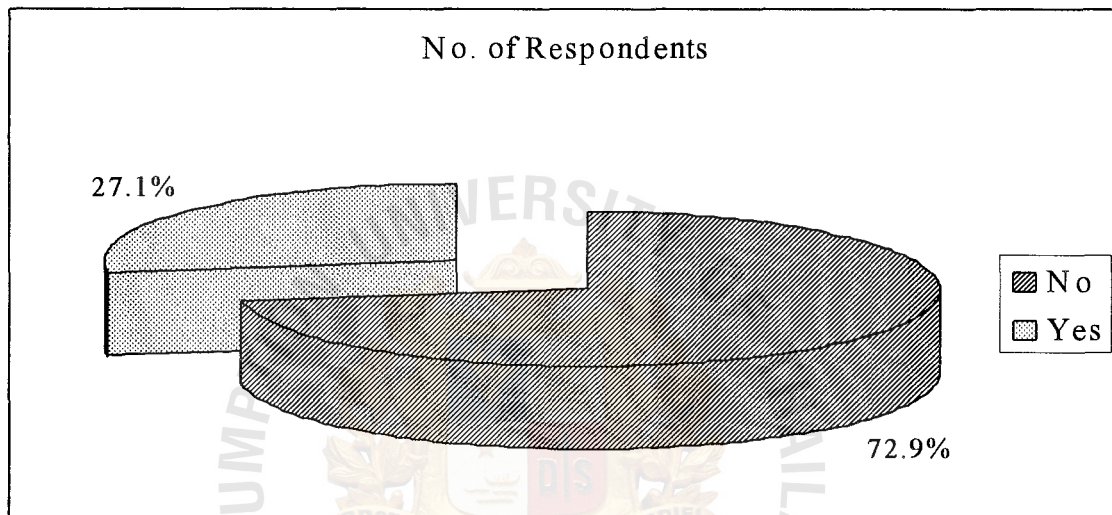| Answer	No. of Respondents	Percentage
No	266	70.00%
Yes	114	30.00%
Total	**380**	**100.00%**

Figure B.11.   Respondents' Awareness from Televisions.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 114 from 380 = 30.00%, and

No for 266 from 380 = 70.00%.

The answer indicated that 30.00% of 380 respondents is aware of Mahanakorn underground train from televisions.

56

Table B.16.   Respondents' Awareness of Mahanakorn Underground Train from Radios.

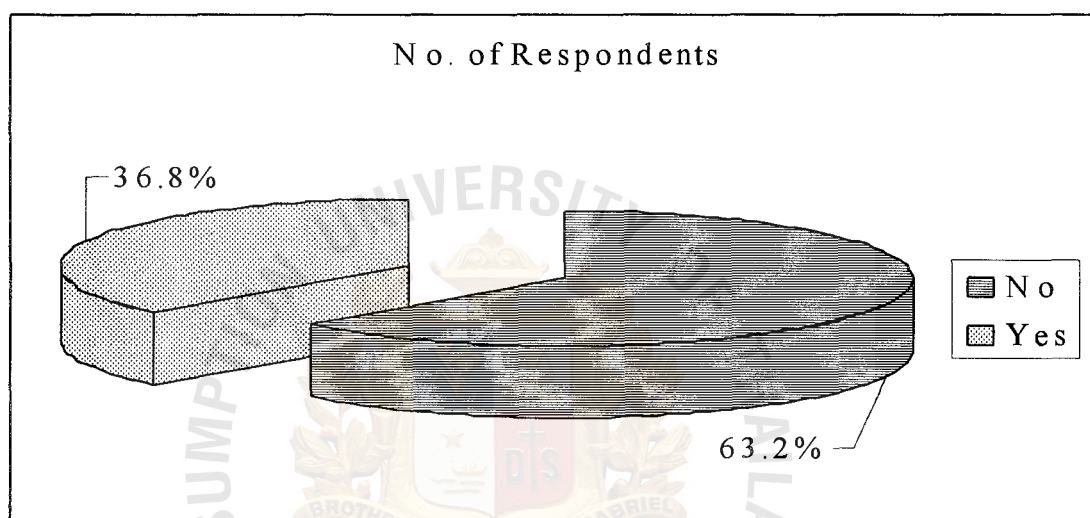| Answer	No. of Respondents	Percentage
No	343	90.30%
Yes	37	9.70%
Total	**380**	**100.00%**

Figure B.12.   Respondents' Awareness from Radios.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 37 from 380 = 9.70%, and

No for 343 from 380 = 90.30%.

The answer indicated that 9.70% of 380 respondents aware of Mahanakorn underground train from radios.

Table B.17.   Respondents' Awareness of Mahanakorn Underground Train from Public Relations.

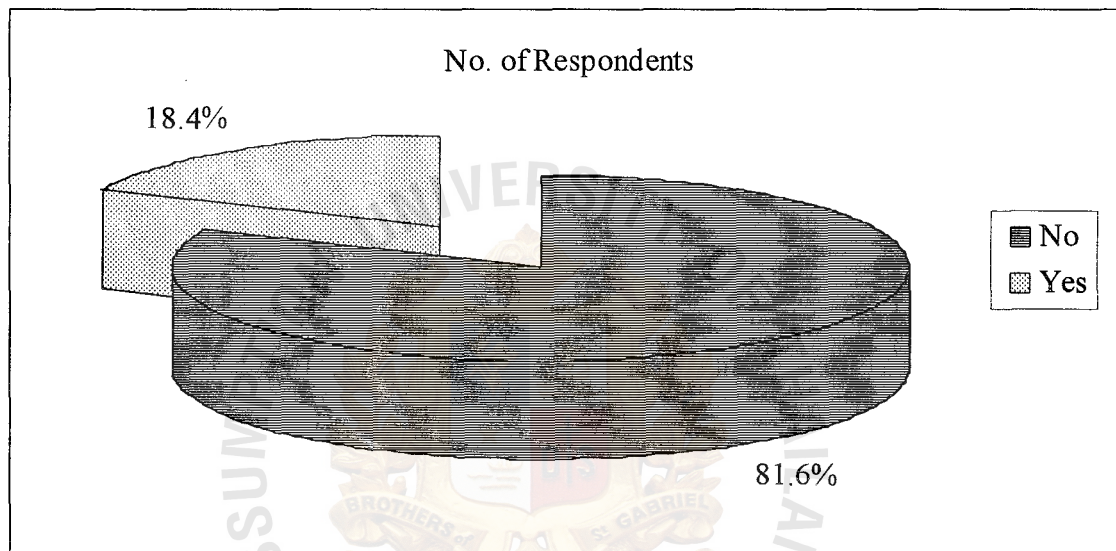| Answer	No. of Respondents	Percentage
No	275	72.40%
Yes	105	27.60%
Total	**380**	**100.00%**
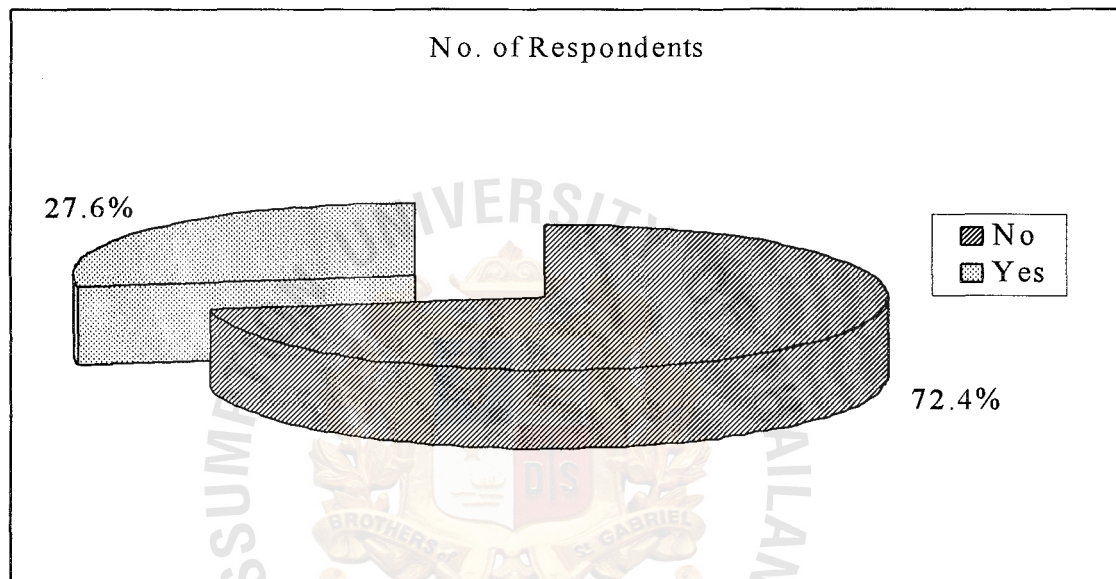
Figure B.13.   Respondents' Awareness from Public Relations.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 105 from 380 = 27.60%, and

No for 275 from 380 = 72.40%.

The answer indicated that 27.60% of 380 respondents is aware of Mahanakorn underground train from public relations.

Table B.18.   Respondents' Awareness of Mahanakorn Underground Train from Other Source.

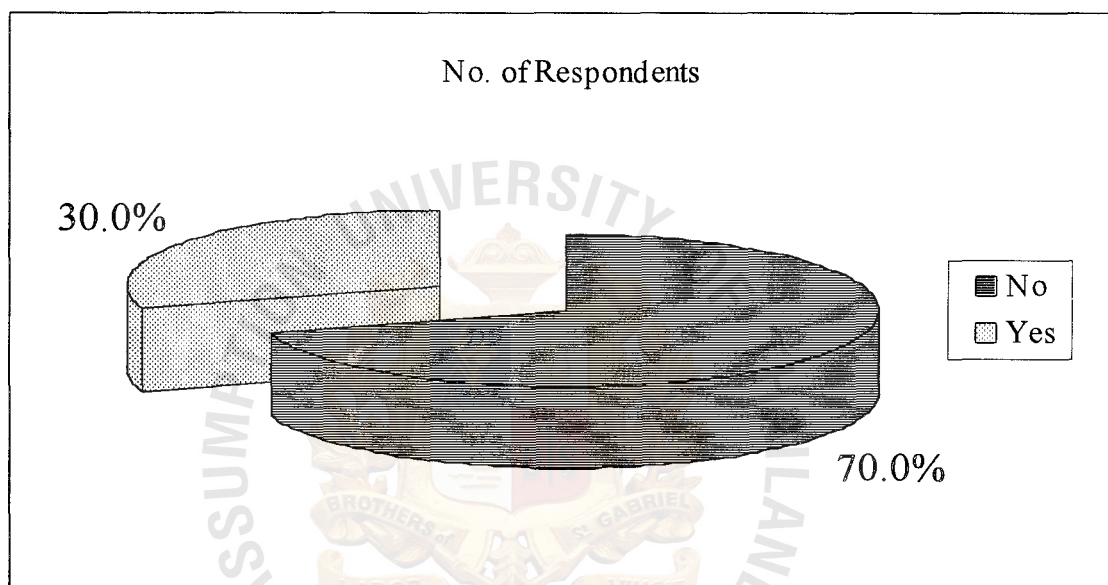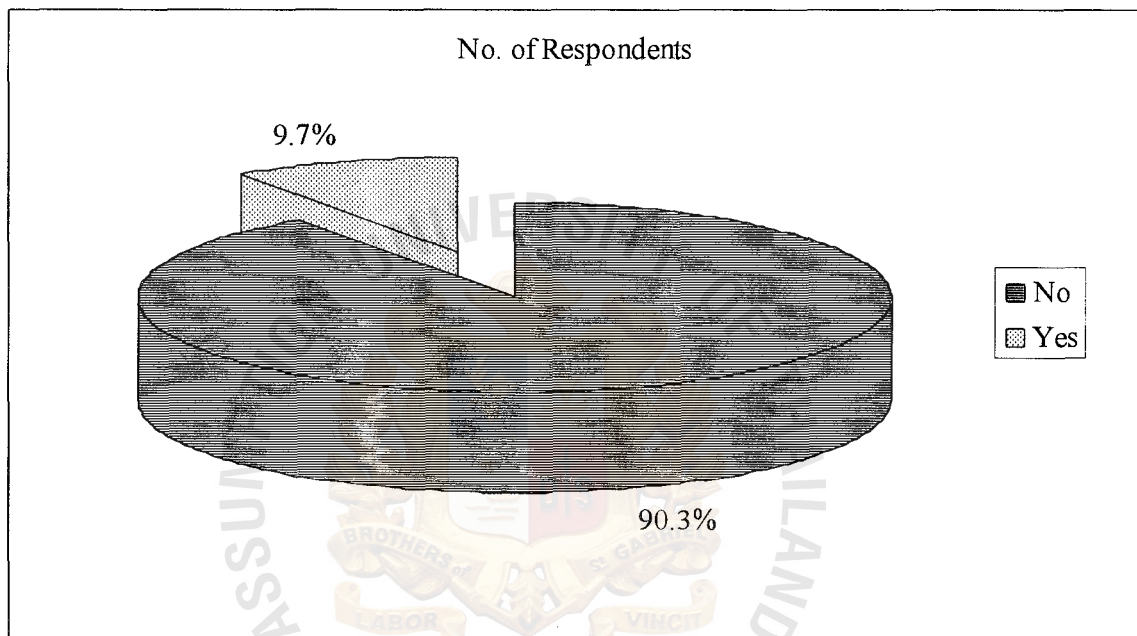| Answer	No. of Respondents	Percentage
No	359	94.50%
Yes	21	5.50%
Total	**380**	**100.00%**
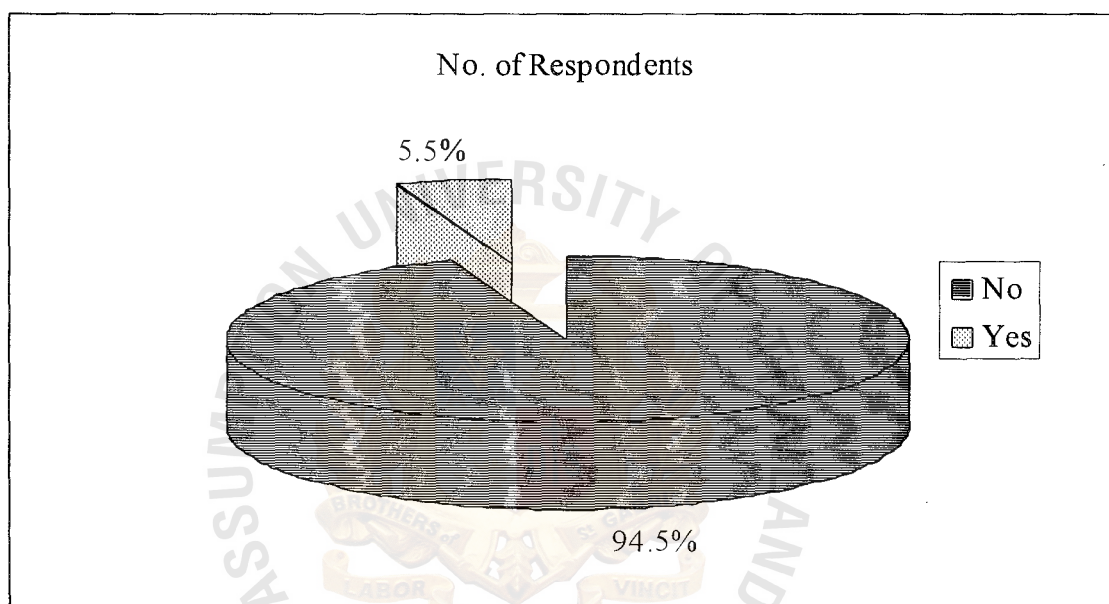
Figure B.14.   Respondents' Awareness from Other Source.

Based on Question No. 2, From which mediums that make you aware of Mahanakorn underground train?

The answer from 380 respondents are presented below:

Yes for 21 from 380 = 5.50%, and

No for 359 from 380 = 94.50%.

The answer indicated that 5.50% of 380 respondents is aware of Mahanakorn underground train from other source that is acknowledgement from passing around the construction areas of Mahanakorn underground train.

Table B.19. Respondents' Mode of Transportation by Walking.

Answer	No. of Respondents	Percentage
No	358	94.20%
Yes	22	5.80%
Total	380	100.00%

Figure B.15. Respondents' Travelling by Walking.

Based on Question No. 3, Usually, How do you travel between home and work place/educational institute?

The answer from 380 respondents are presented below:

Yes for 22 from 380 = 5.80%, and

No for 358 from 380 = 94.20%.

60

The answer indicated that 5.80% of 380 respondents travel between home and work place/educational institute by walking.

Table B.20. Respondents' Mode of Transportation by Private Cars.

Answer	No. of Respondents	Percentage
No	207	54.50%
Yes	173	45.50%
Total	**380**	**100.00%**

Figure B.16. Respondents' Travelling by Private Cars.

Based on Question No. 3, Usually, How do you travel between home and work place/educational institute?

The answer from 380 respondents are presented below:

Yes for 173 from 380 = 45.50%, and

No for 207 from 380 = 54.50%.

The answer indicated that 45.50% of 380 respondents travel between home and work place/educational institute by private cars.

Table B.21.   Respondents' Mode of Transportation by Boat.

Answer	No. of Respondents	Percentage
No	362	95.30%
Yes	18	4.70%
Total	**380**	**100.00%**

Figure B.17.   Respondents' Travelling by Boats.

Based on Question No. 3, Usually, How do you travel between home and work place/educational institute?

The answer from 380 respondents are presented below:

Yes for 18 from 380 = 4.70%, and

No for 362 from 380 = 95.30%.

The answer indicated that 4.70% of 380 respondents travel between home and work place/educational institute by boats.

Table B.22.   Respondents' Mode of Transportation by Micro-bus.

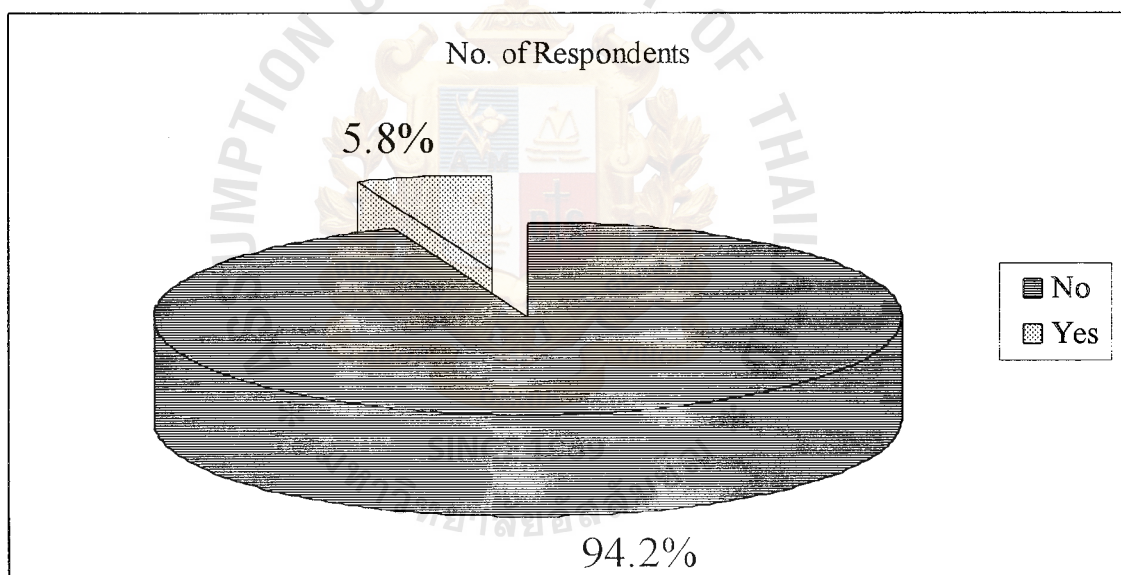| Answer	No. of Respondents	Percentage
No	352	92.60%
Yes	28	7.40%
Total	**380**	**100.00%**

Figure B.18.   Respondents' Travelling by Micro-bus.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 28 from 380 = 7.40%, and

No for 352 from 380 = 92.60%.

The answer indicated that 7.40% of 380 respondents travel between home and workplace/educational institute by micro-bus.

Table B.23.   Respondents' Mode of Transportation by Motor Cycles.

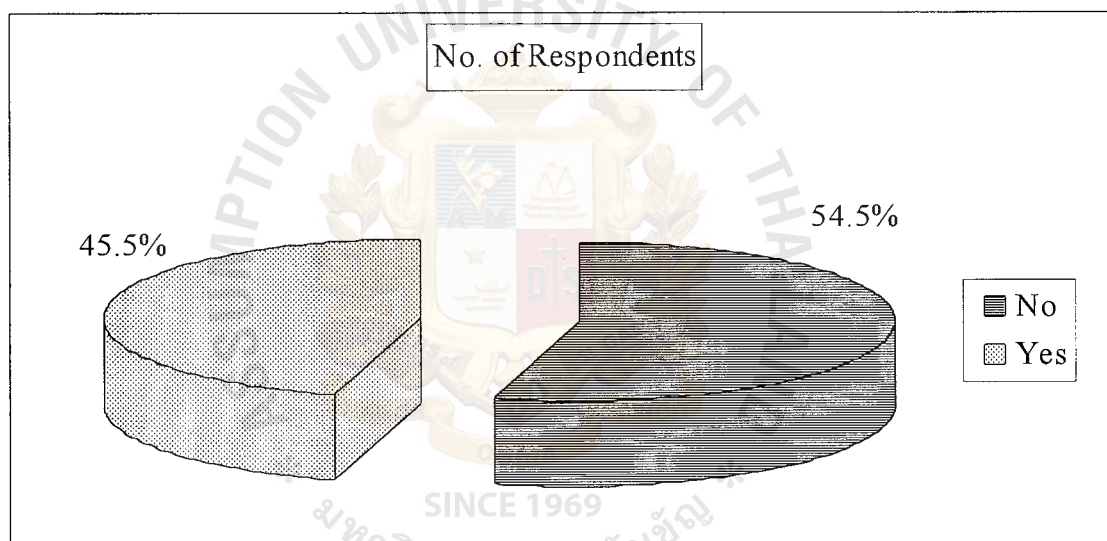| Answer	No. of Respondents	Percentage
No	347	91.30%
Yes	33	8.70%
Total	**380**	**100.00%**

Figure B.19.   Respondents' Travelling by Motor Cycles.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 33 from 380 = 8.70%, and

No for 347 from 380 = 91.30%.

64

The answer indicated that 8.70% of 380 respondents travel between home and workplace/educational institute by motor cycles.

Table B.24. Respondents' Mode of Transportation by Taxi.

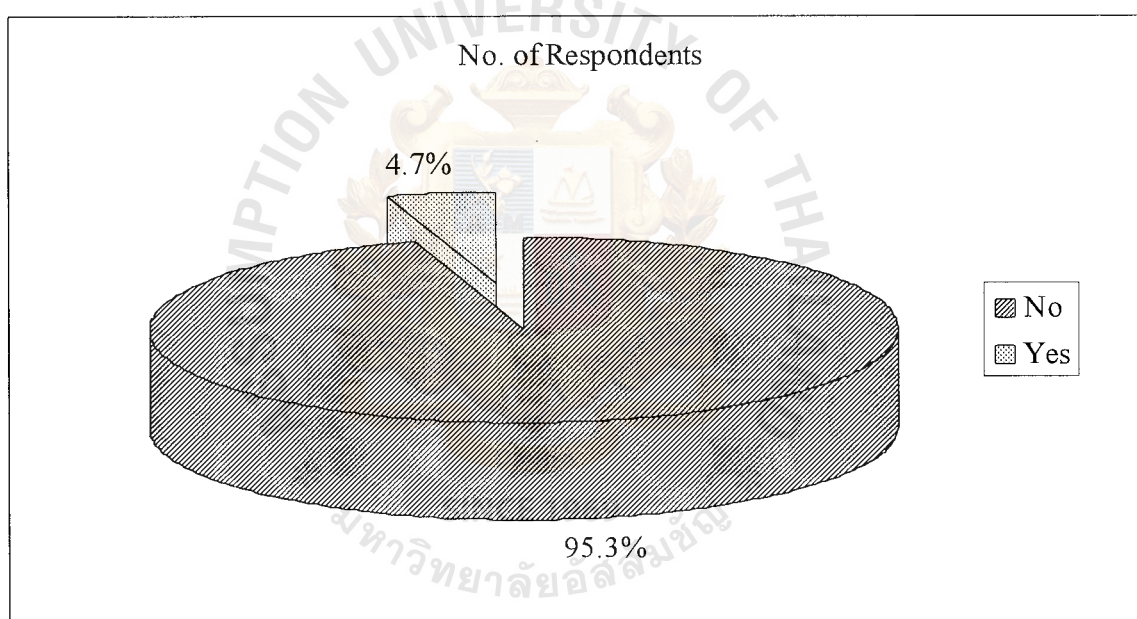| Answer	No. of Respondents	Percentage
No	343	90.30%
Yes	37	9.70%
Total	**380**	**100.00%**

Figure B.20. Respondents' Travelling by Taxi.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 37 from 380 = 9.70%, and

No for 343 from 380 = 90.30%.

The answer indicated that 9.70% of 380 respondents travel between home and workplace/educational institute by taxi.

Table B.25.   Respondents' Mode of Transportation by Trains.

Answer	No. of Respondents	Percentage
No	343	90.30%
Yes	37	9.70%
Total	**380**	**100.00%**

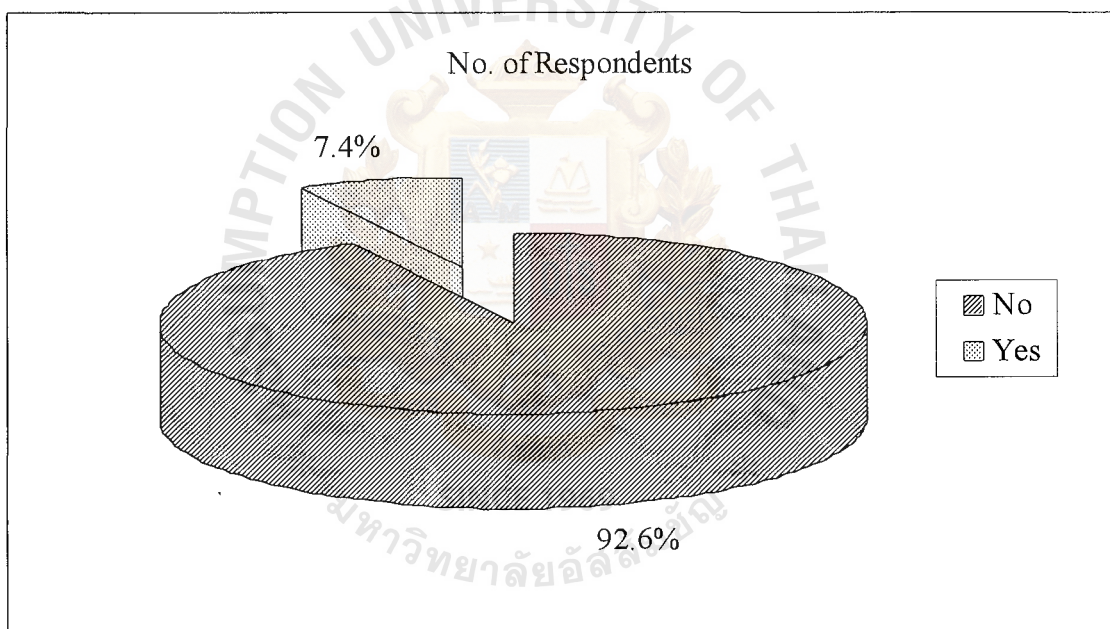

Figure B.20.   Respondents' Travelling by Trains.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 15 from 380 = 3.90%, and

No for 365 from 380 = 96.10%.

The answer indicated that 3.90% of 380 respondents travel between home and workplace/educational institute by train.

Table B.26.   Respondents' Mode of Transportation by BTS Sky-train.

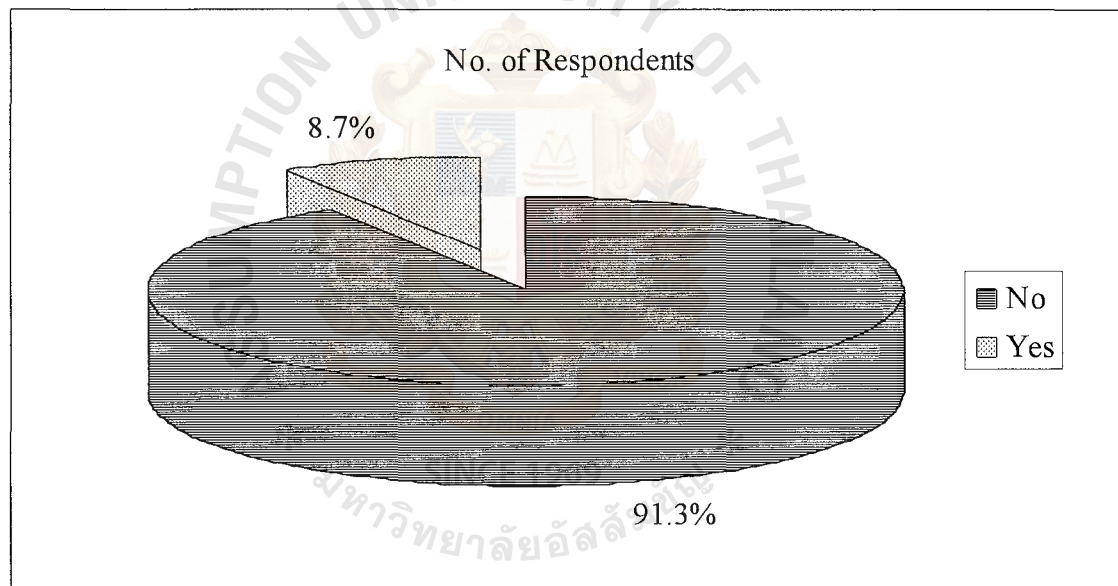| Answer	No. of Respondents	Percentage
No	334	87.90%
Yes	46	12.10%
Total	**380**	**100.00%**

Figure B.22.   Respondents' Travelling by BTS Sky-train.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 15 from 380 = 12.10%, and

No for 365 from 380 = 87.90%.

The answer indicated that 12.10% of 380 respondents travel between home and workplace/educational institute by BTS sky-train.

Table B.27.   Respondents' Mode of Transportation by Bus.

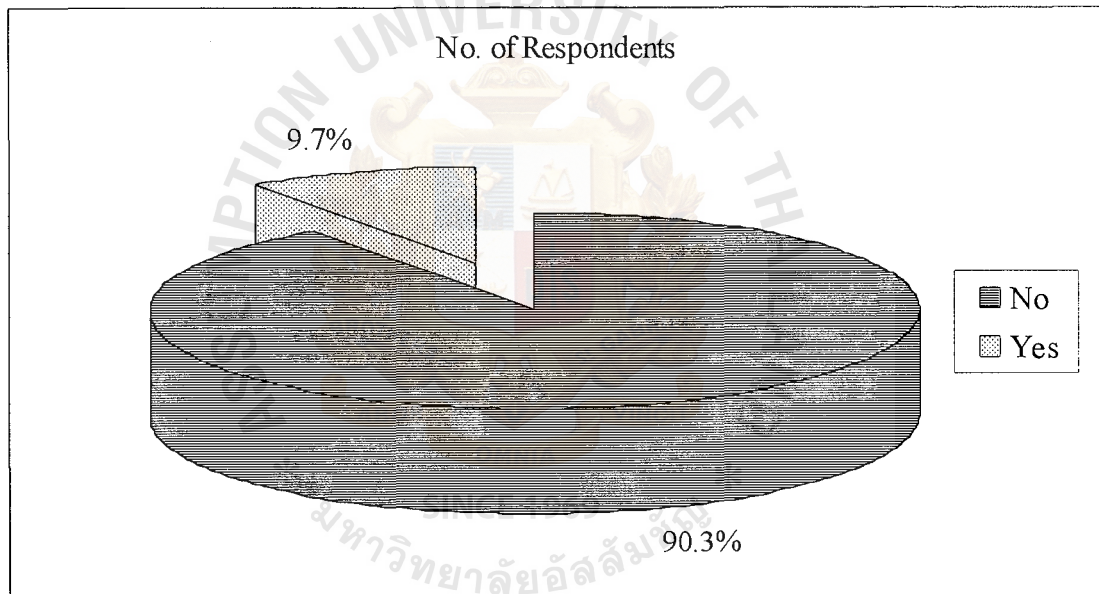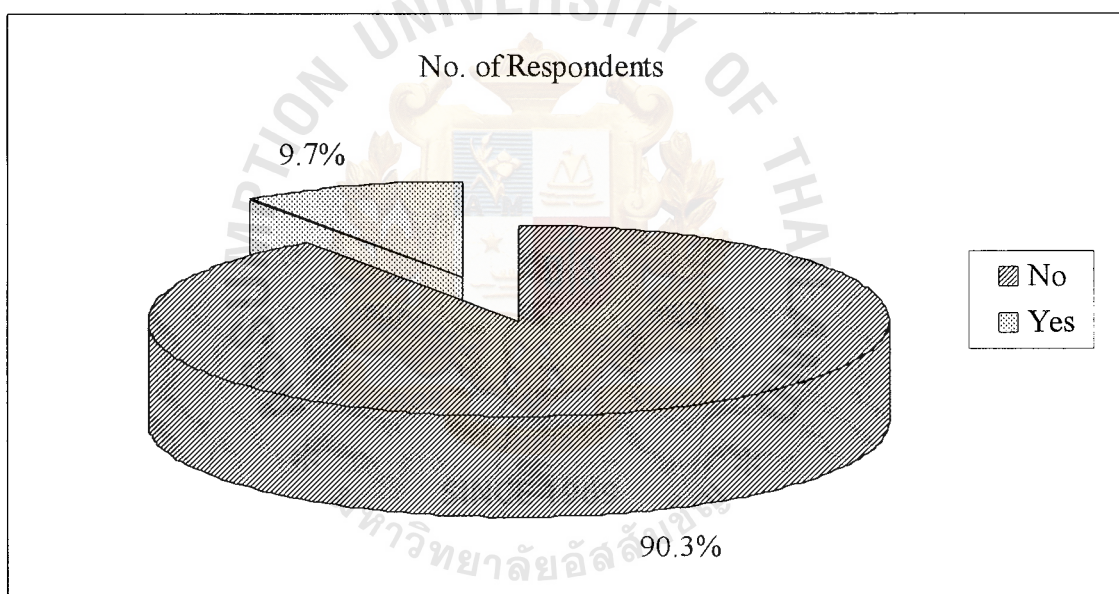| Answer	No. of Respondents	Percentage
No	284	74.70%
Yes	96	25.30%
Total	**380**	**100.00%**
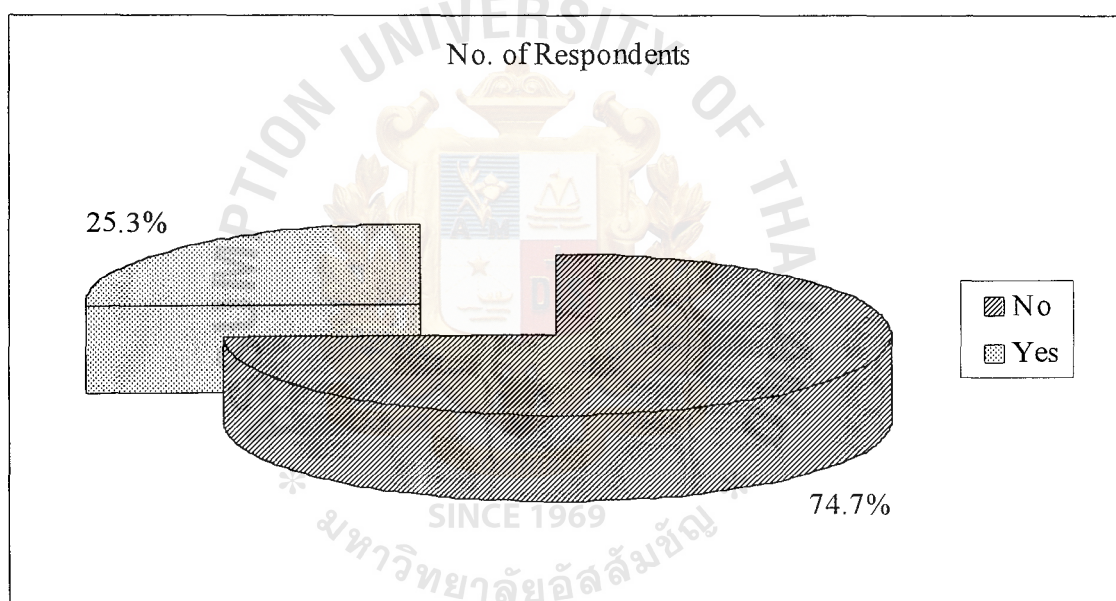
Figure B.23.   Respondents' Travelling by Bus.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 96 from 380 = 25.30%, and

No for 284 from 380 = 74.70%.

The answer indicated that 25.30% of 380 respondents travel between home and workplace/educational institute by bus.

Table B.28.   Respondents' Mode of Transportation by Air-conditioned Bus.

Answer	No. of Respondents	Percentage
No	279	73.40%
Yes	101	26.60%
Total	**380**	**100.00%**
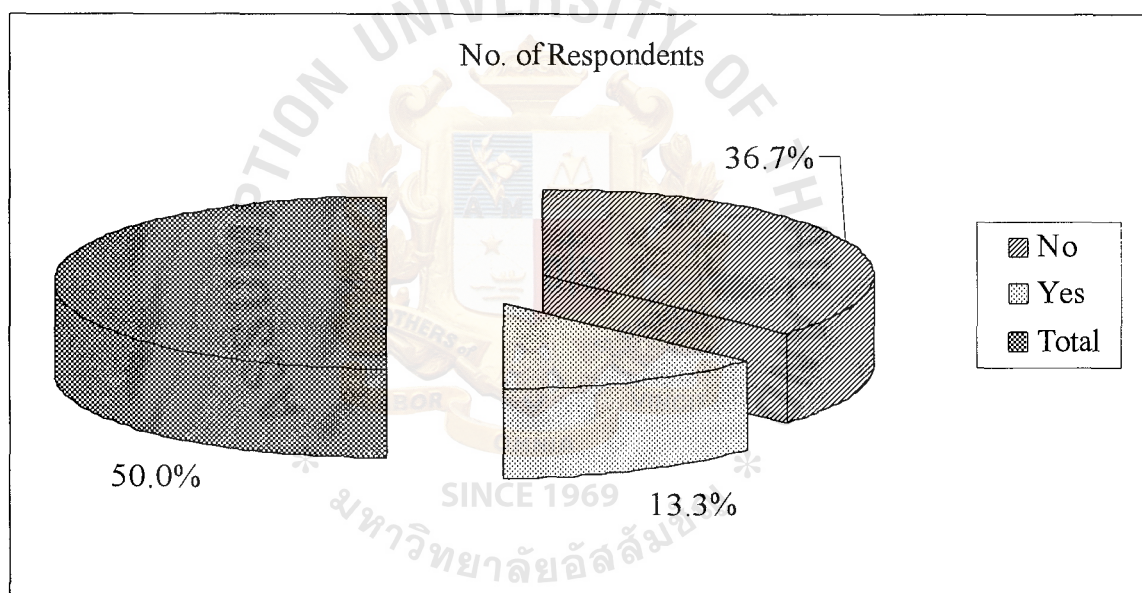
Figure B.24.   Respondents' Travelling by Air-conditioned Bus.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 101 from 380 = 26.60%, and

No for 279 from 380 = 73.40%.

69

The answer indicated that 26.60% of 380 respondents travel between home and workplace/educational institute by air-conditioned bus.

Table B.29.   Respondents' Mode of Transportation by Others.

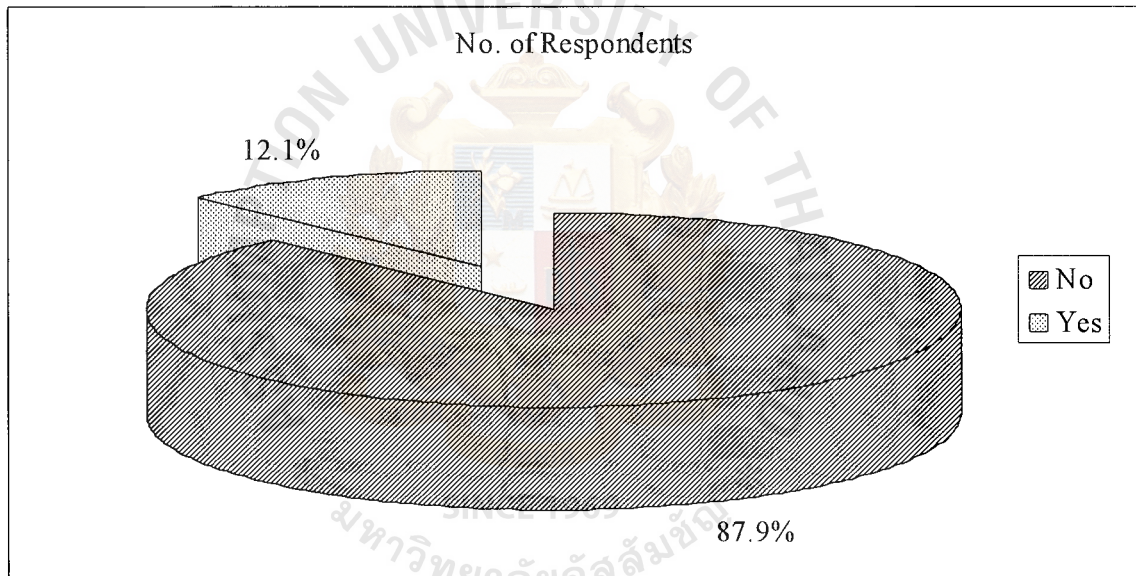| Answer	No. of Respondents	Percentage
No	352	92.60%
Yes	28	7.40%
Total	**380**	**100.00%**
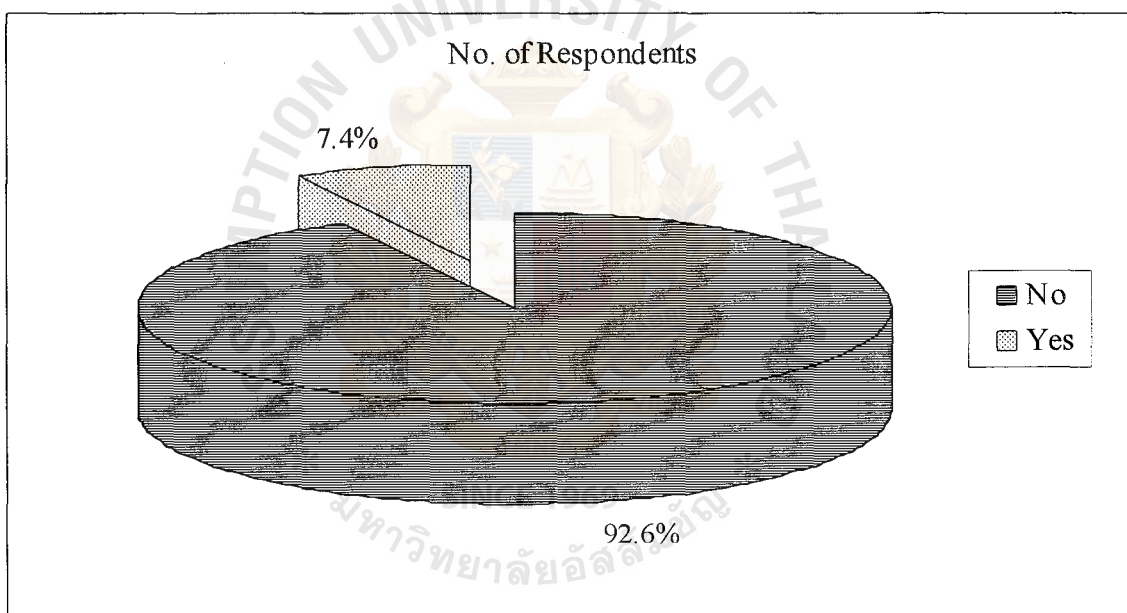
Figure B.25.   Respondents' Travelling by Others.

Based on Question No. 3, Usually, How do you travel between home and workplace/educational institute?

The answer from 380 respondents are presented below:

Yes for 28 from 380 = 7.40%, and No for 352 from 380 = 92.60%.

The answer indicated that 7.40% of 380 respondents travel between home and workplace/educational institute by others which is the public van and the van provided the service by the education institute.

Table B.30.   Travel Expense per Day.

Range of Travel Expense	No. of Respondents	Percentage
Between 0-10 Bahts	47	12.4
Between 11-20 Bahts	38	10
Between 21-30 Bahts	32	8.4
Between 31-40 Bahts	27	7.1
Between 41-50 Bahts	41	10.8
Between 51-60 Bahts	19	5
Between 61-70 Bahts	23	6
Between 71-80 Bahts	27	7.1
Between 81-90 Bahts	3	0.8
Between 91-100 Bahts	54	14.2
Between 101-110 Bahts	1	0.3
Between 111-120 Bahts	7	1.8
Between 121-130 Bahts	1	0.3
Between 131-140 Bahts	2	0.5
Between 141-150 Bahts	26	6.9
Between 171-180 Bahts	1	0.2
Between 191-200 Bahts	25	6.6
Between 211-220 Bahts	1	0.3
Between 241-250 Bahts	1	0.2
Between 291-300 Bahts	3	0.8
Between 391-400 Bahts	1	0.3
Total	**380**	**100**

Based on Question No. 4, How much is your average travel expense per day between home and workplace/educational institute?

The answer from the table listed above indicated that the mode value; 54 from 380

72

respondents equals to 14.20%, which means that the biggest group of respondents spend approximately 100 Bahts for their travel expenses. The average travel expense of 380 respondents is 72.60 Bahts.

Table B.31. Respondents' Travel Distance.

Answer	No. of Respondents	Percentage
Less than 5 kilometers	56	14.7
5-15 kilometers	135	35.5
16-25 kilometers	79	20.8
26-35 kilometers	47	12.4
More than 35 kilometers	63	16.6
Total	**380**	**100**
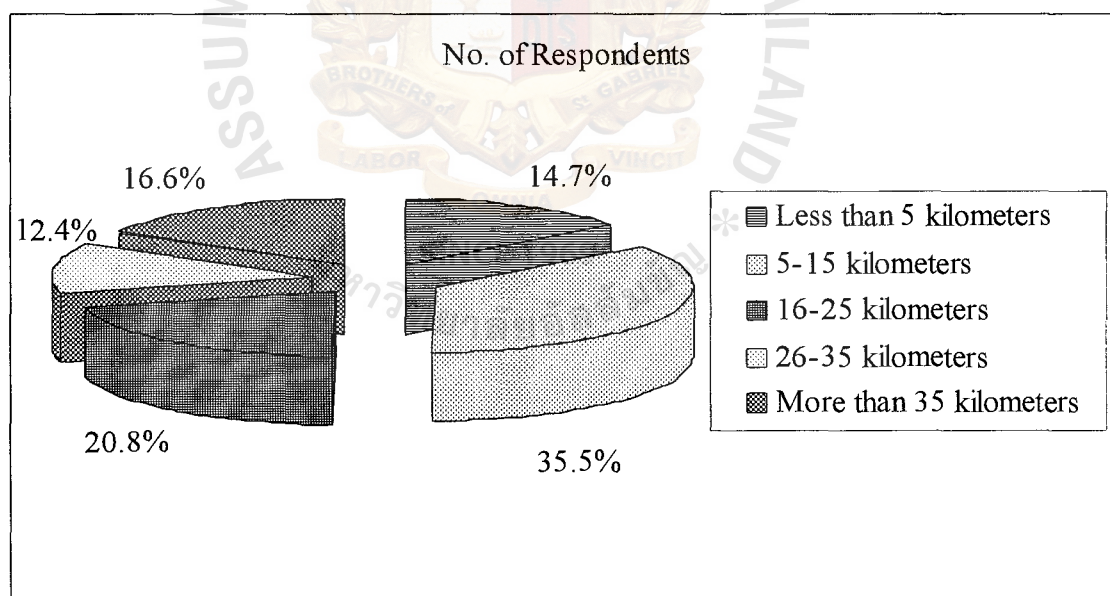
Figure B.26. Respondents' Travel Distance.

Based on Question No. 5, How far is the distance between home and work place/educational institute?

The answer from the table listed above indicated that the mode value; 135 from 380 respondents equals to 35.50%, which means that the biggest group of respondents travel between home and workplace or educational institute approximately 5-15 kilometers.

Table B.32.   Range of Time Travelling from Home to Workplace/Educational Institute.

Answer	No. of Respondents	Percentage
04.01-05.00 a.m.	7	1.8
05.01-06.00 a.m.	35	9.2
06.01-07.00 a.m.	97	25.5
07.01-08.00 a.m.	121	31.8
08.01-09.00 a.m.	74	19.5
09.01-10.00 a.m.	36	9.5
10.01-11.00 a.m.	8	2.1
11.01 a.m.-12.00 p.m.	0	0
12.01-04.00 p.m.	1	0.3
04.01-05.00 p.m.	0	0
05.01-06.00 p.m.	1	0.3
06.01-07.00 p.m.	0	0
07.01-08.00 p.m.	0	0
08.01-09.00 p.m.	0	0
09.01-10.00 p.m.	0	0
10.01-11.00 p.m.	0	0
11.01-12.00 a.m.	0	0
After midnight to 04.00 a.m.	0	0
Total	**380**	**100**

No. of Respondents

Legend
☐ 04.01-05.00 a.m.
▦ 05.01-06.00 a.m.
▨ 06.01-07.00 a.m.
▨ 07.01-08.00 a.m.
▩ 08.01-09.00 a.m.
▨ 09.01-10.00 a.m.
▩ 10.01-11.00 a.m.
☐ 12.01-04.00 p.m.
▨ 05.01-06.00 p.m.

0.3%
0.3%
9.5%   2.1%   1.8%   9.2%
19.5%
25.5%
31.8%

Figure B.27.   Range of Time Travelling from Home to Workplace/Educational Institute.

Based on Question No. 6, Normally, What range of time do you travel from home to workplace/educational institute?

The answer from the table listed above indicated that the mode value; 121 from 380 respondents equals to 31.80%, which means that the biggest group of respondents travel from home to workplace or educational institute between 07.01-08.00 a.m.

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Table B.33.   Range of Time Travelling from Workplace/Educational Institute to Home.

Answer	No. of Respondents	Percentage
04.01-05.00 a.m.	1	0.25
05.01-06.00 a.m.	0	0
06.01-07.00 a.m.	1	0.25
07.01-08.00 a.m.	0	0
08.01-09.00 a.m.	0	0
09.01-10.00 a.m.	4	1.1
10.01-11.00 a.m.	25	6.6
11.01 a.m.-12.00 p.m.	53	13.9
12.01-04.00 p.m.	85	22.4
04.01-05.00 p.m.	111	29.2
05.01-06.00 p.m.	58	15.2
06.01-07.00 p.m.	28	7.4
07.01-08.00 p.m.	12	3.2
08.01-09.00 p.m.	2	0.5
09.01-10.00 p.m.	0	0
10.01-11.00 p.m.	0	0
11.01-12.00 a.m.	0	0
After midnight to 04.00 a.m.	0	0
Total	**380**	**100**

76

No. of Respondents

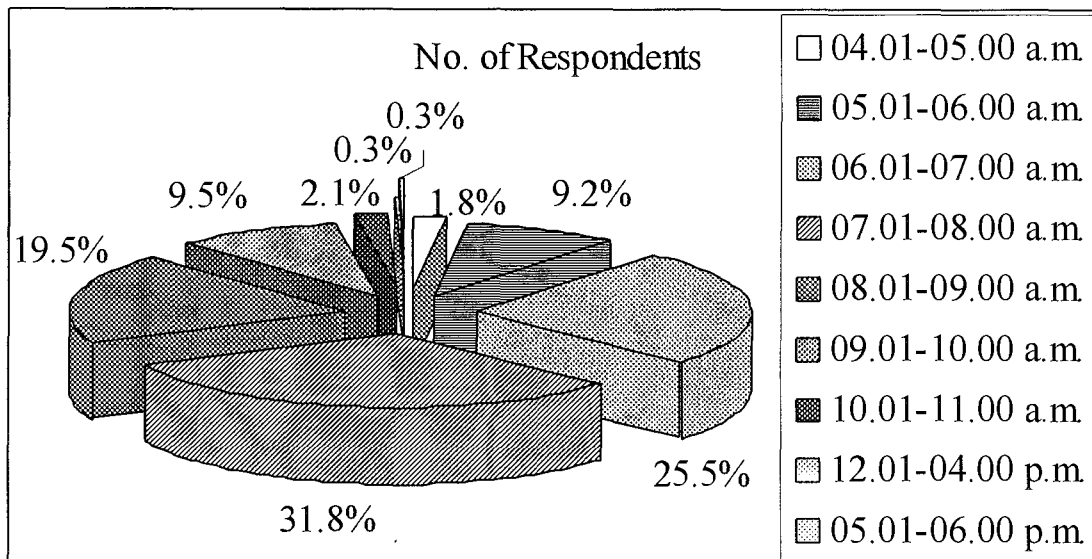|	
▨	04.01-05.00 a.m.
▨	06.01-07.00 a.m.
☐	09.01-10.00 a.m.
▨	10.01-11.00 a.m.
▥	11.01 a.m.-12.00 p.m.
■	12.01-04.00 p.m.
▤	04.01-05.00 p.m.
▨	05.01-06.00 p.m.
▨	06.01-07.00 p.m.
▨	07.01-08.00 p.m.
▨	08.01-09.00 p.m.
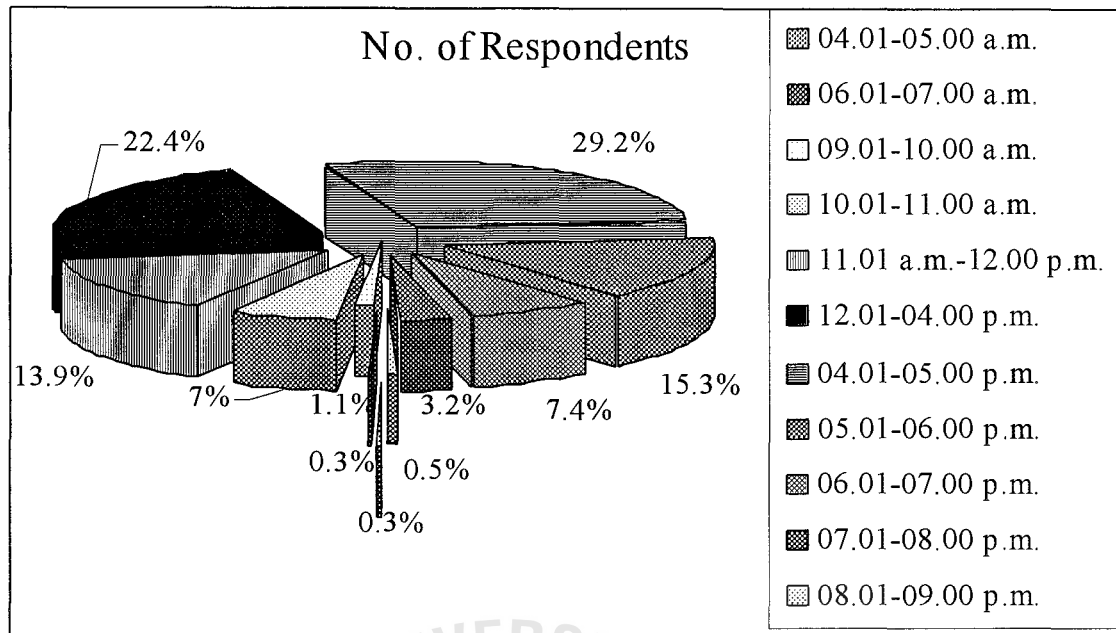
Figure B.28.   Range of Time Travelling from Workplace/Educational Institute to Home.

Based on Question No. 7, Normally, What range of time do you travel from work place/educational institute to home?

The answer from the table listed above indicated that the mode value; 111 from 380 respondents equals to 29.20%, which means that the biggest group of respondents travel from workplace or educational institute to home between 04.01-05.00 p.m.

Table B.34.   Respondents' Attitude towards Public Transportation.

Answer	No. of Respondents	Percentage
Satisfied	90	23.7
Unsatisfied	227	59.7
Never used the service from the public transportation	63	16.6
Total	**380**	**100**
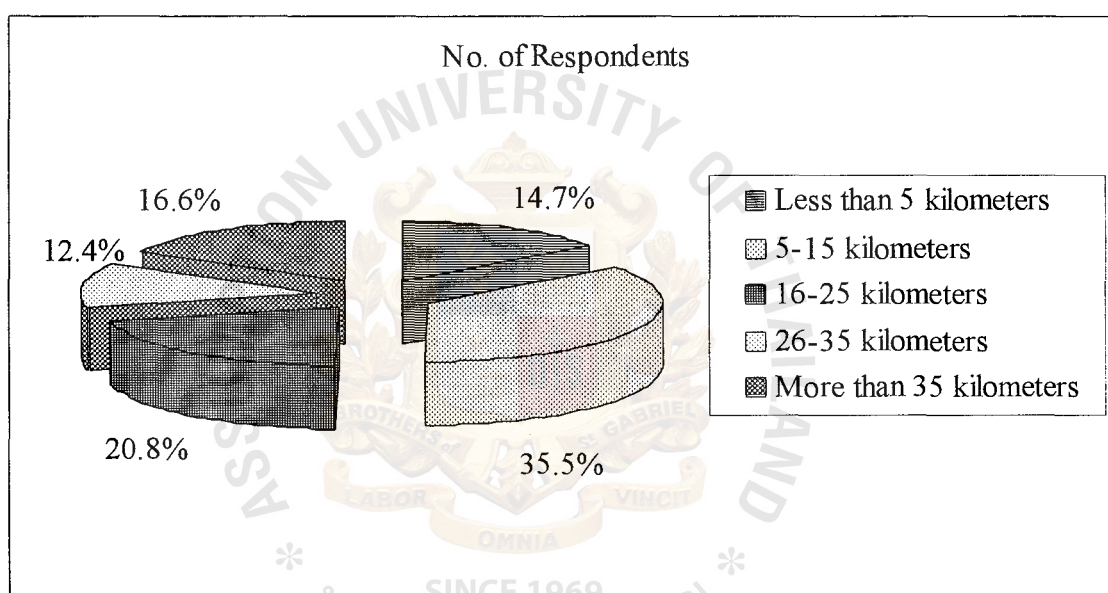
Figure B.29.   Respondents' Attitude towards Public Transportation.

Based on Question No. 8, Are you currently satisfied with the service you usually received from the public transportation?

The answer from the table listed above indicated that the mode value; 227 from 380 respondents equals to 59.70% which means that the biggest group of respondents are currently unsatisfied with the service they received from the public transportation.

Part II: The Opinion of general people regarding the factors that affect their decision

to choose Mahanakorn underground train as an alternative way to

transportation.

Table B.35.   Respondents' Decision of the Service Trial.

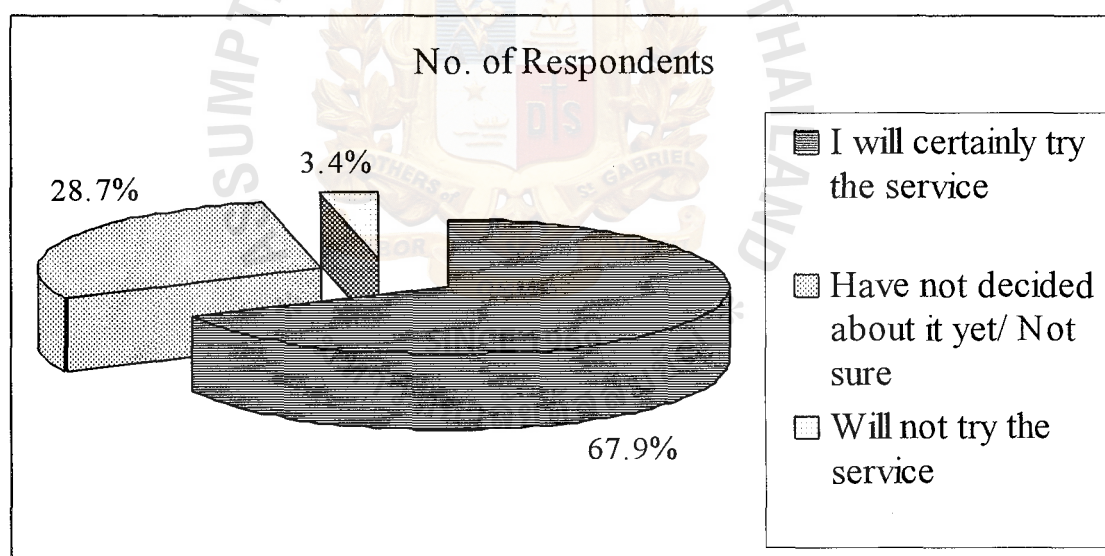| Answer	No. of Respondents	Percentage
I will certainly try the service	258	67.9
Have not decided about it yet/ Not sure	109	28.7
Will not try the service	13	3.4
Total	**380**	**100**

Figure B.30.   Respondents' Decision of the Service Trial.

Based on Question No. 9, Whenever Mahanakorn underground train is available

for service, Will you choose it as your alternative way of transportation?

The answer from the table listed above indicated that the mode value; 258 from 380 respondents equals to 67.90% which means that the biggest group of respondents will choose it as their alternative way of transportation whenever Mahanakorn underground train is available for service.

Table B.36.   Factor Influences the Respondents' Trials Based on Routes.

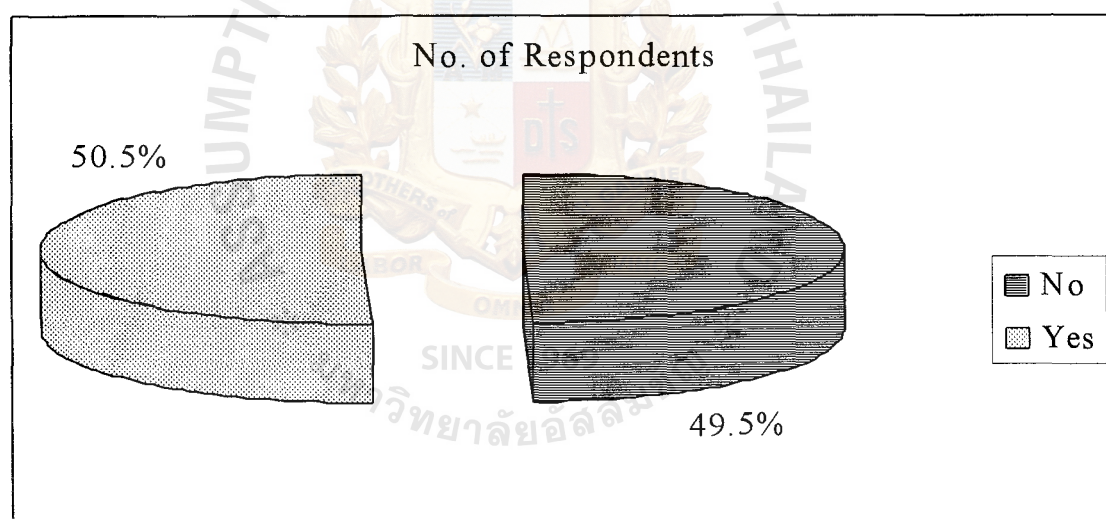| Answer	No. of Respondents	Percentage
No	188	49.5
Yes	192	50.5
Total	**380**	**100**

Figure B.31.   Factor Influences the Respondents' Trials Based on Routes.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 192 from 380 = 50.50%, and

No for 188 from 380 = 49.50%.

The answer indicated that 50.50% of 380 respondents agree that routes that cover their destination is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.37. Factor Influences the Respondents' Trial Based on Convenience.

Answer	No. of Respondents	Percentage
No	259	68.2
Yes	121	31.8
Total	380	100

Figure B.32. Factor Influences the Respondents' Trial Based on Convenience.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 121 from 380 = 31.80%, and

81

No for 259 from 380 = 68.20%.

The answer indicated that 31.80% of 380 respondents agree that the convenience in using the service is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.38.   Factor Influences the Respondents' Trial Based on Cleanliness.

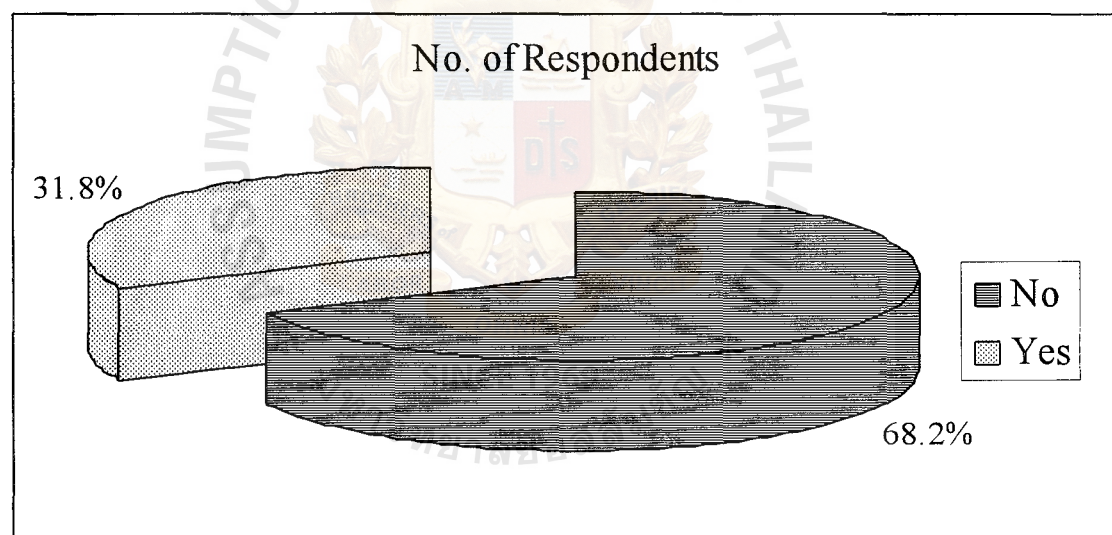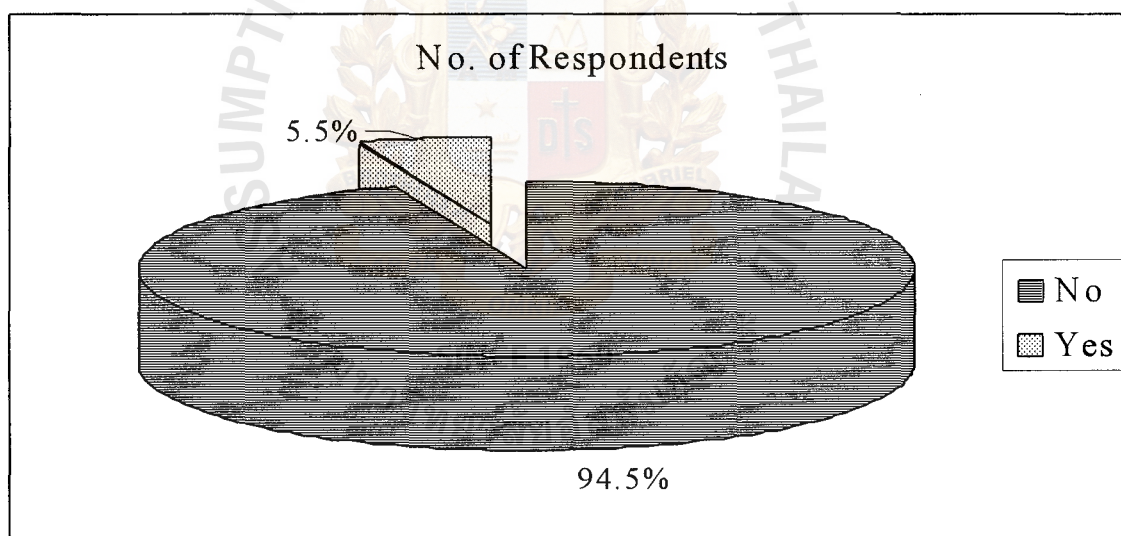| Answer	No. of Respondents	Percentage
No	359	94.5
Yes	21	5.5
Total	**380**	**100**

Figure B.33.   Factor Influences the Respondents' Trial Based on Cleanliness.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 21 from 380 = 5.50%, and

No for 359 from 380 = 94.50%.

The answer indicated that 5.50% of 380 respondents agree that the cleanliness of the premise is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.39.   Factor Influences the Respondents' Trial Based on Fare.

Answer	No. of Respondents	Percentage
No	275	72.4
Yes	105	27.6
Total	**380**	**100**

Figure B.34.   Factor Influences the Respondents' Trial Based on Fare.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 105 from 380 = 27.60%, and

No for 275 from 380 = 72.40%.

The answer indicated that 27.60% of 380 respondents agree that fare is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.40.   Factor Influences the Respondents' Trial Based on Service.

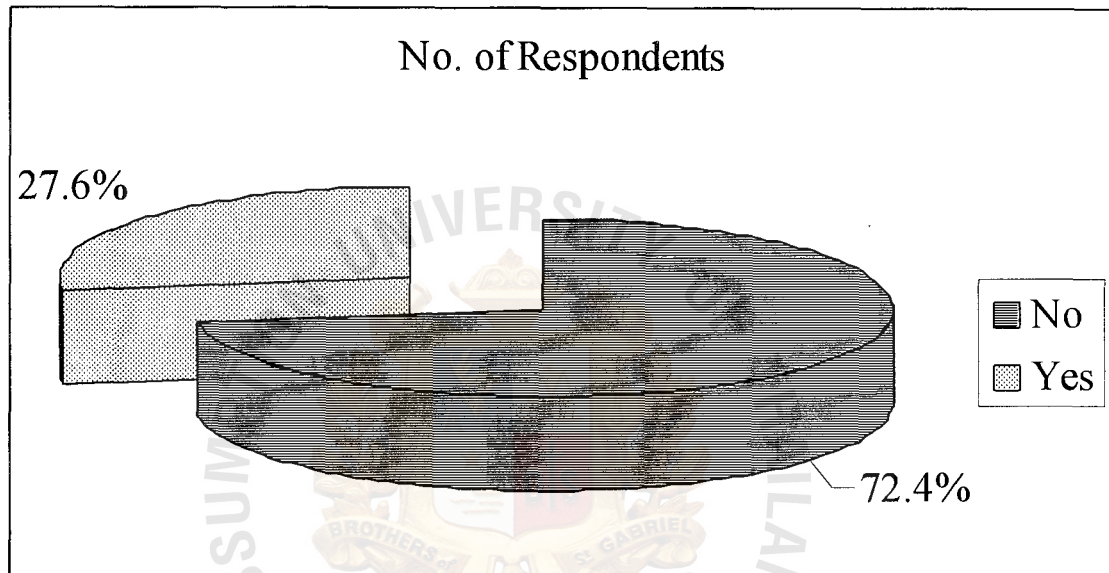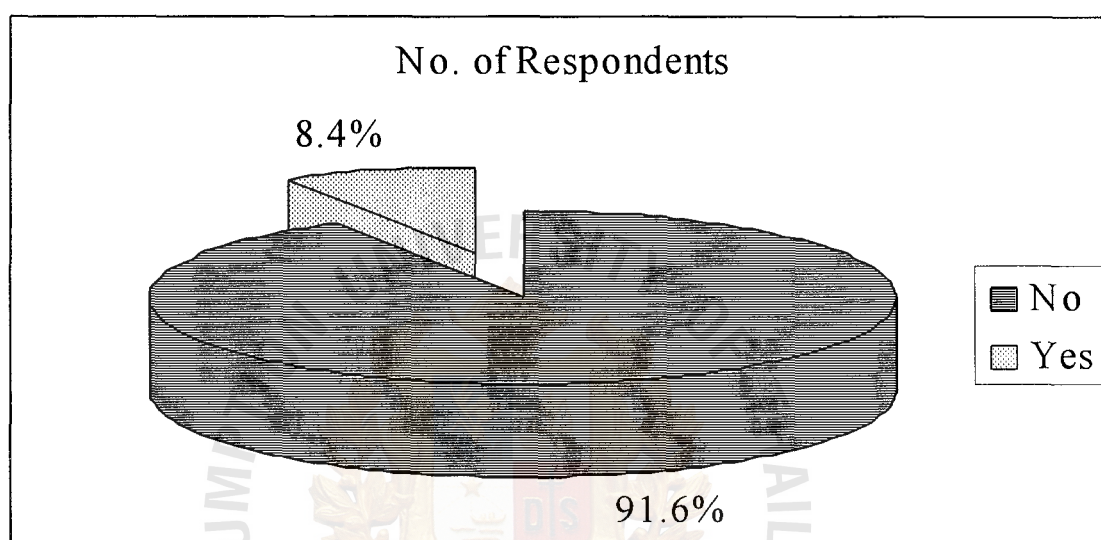| Answer	No. of Respondents	Percentage
No	348	91.6
Yes	32	8.4
Total	**380**	**100**

Figure B.35.   Factor Influences the Respondents' Trial Based on Service.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 32 from 380 = 8.40%, and

No for 348 from 380 = 91.60%.

The answer indicated that 8.40% of 380 respondents agree that the service is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.41. Factor Influences the Respondents' Trial Based on Fastness.

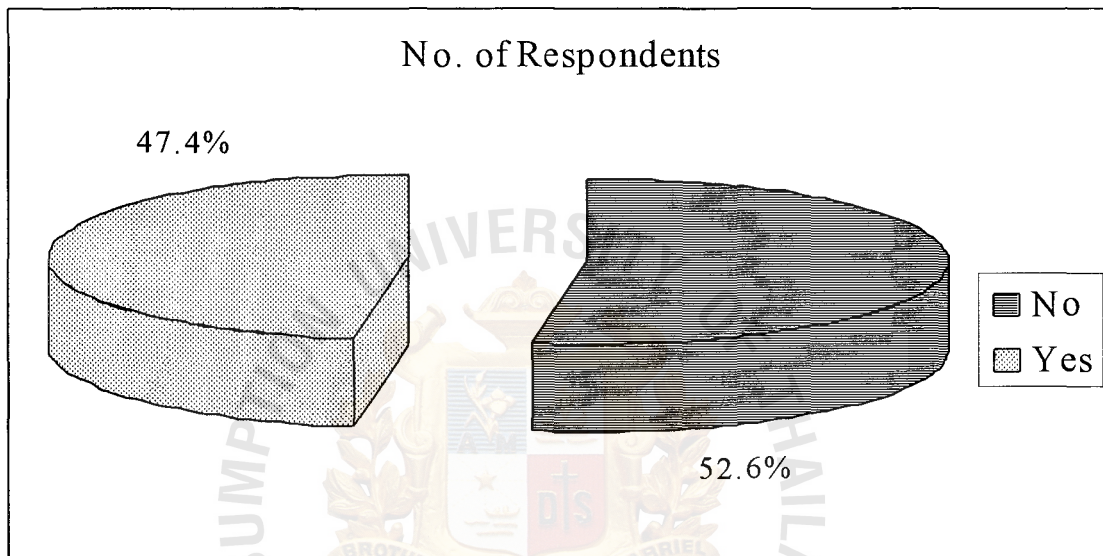| Answer	No. of Respondents	Percentage
No	200	52.6
Yes	180	47.4
Total	**380**	**100**

Figure B.36. Factor Influences the Respondents' Trial Based on Fastness.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 180 from 380 = 47.40%, and

No for 200 from 380 = 52.60%.

The answer indicated that 47.40% of 380 respondents agree that the fastness of Mahanakorn underground train is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.42.   Factor Influences the Respondents' Trial Based on Safety.

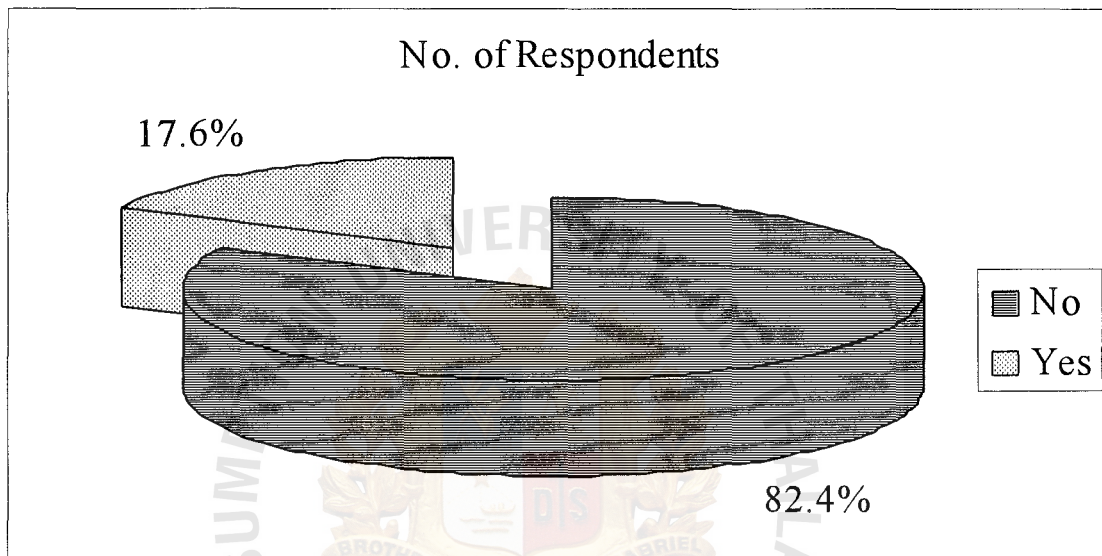| Answer	No. of Respondents	Percentage
No	313	82.4
Yes	67	17.6
Total	**380**	**100**

Figure B.37.   Factor Influences the Respondents' Trial Based on Safety.

Based on Question No.10, Which factors that affect your decision to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 67 from 380 = 17.60%, and

No for 313 from 380 = 82.40%.

The answer indicated that 17.60% of 380 respondents agree that the safety in using Mahanakorn underground train service is the factor that affects their decision to choose Mahanakorn underground train for their transportation.

Table B.43.   Factor Influences the Respondents' Non-trial Based on Unfamiliarity.

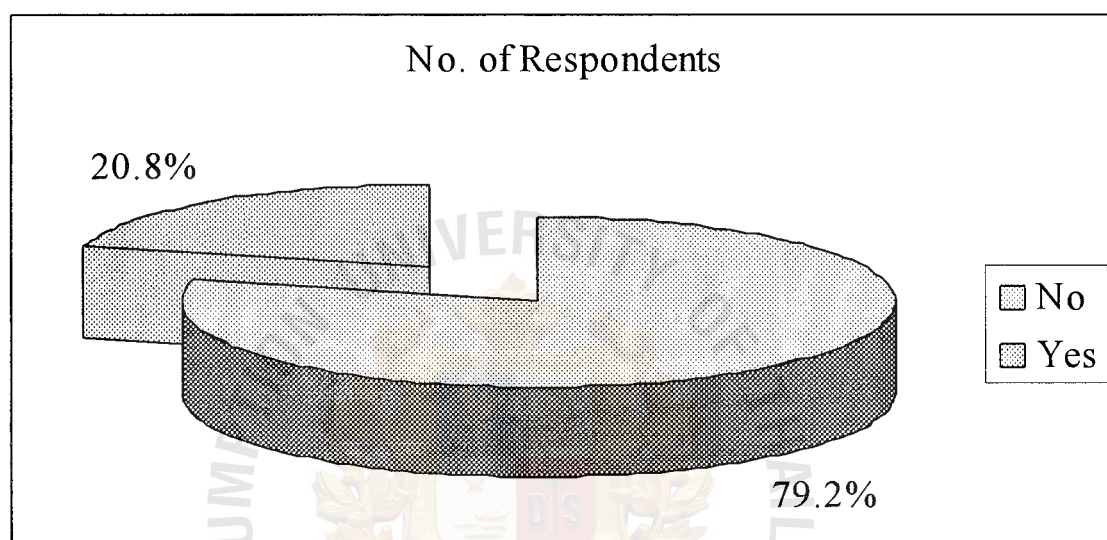| Answer	No. of Respondents	Percentage
No	301	79.2
Yes	79	20.8
Total	**380**	**100**

Figure B.38.   Factor Influences the Respondents' Non-trial Based on Unfamiliarity.

Based on Question No.11, Which factors that affect your decision not to choose

Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 79 from 380 = 20.80%, and

No for 301 from 380 = 79.20%.

The answer indicated that 20.80% of 380 respondents agree that the unfamiliarity

in using Mahanakorn underground train service is the factor that affects their decision

not to choose Mahanakorn underground train for their transportation.

Table B.44.   Factor Influences the Respondents' Non-trial Based on Fare.

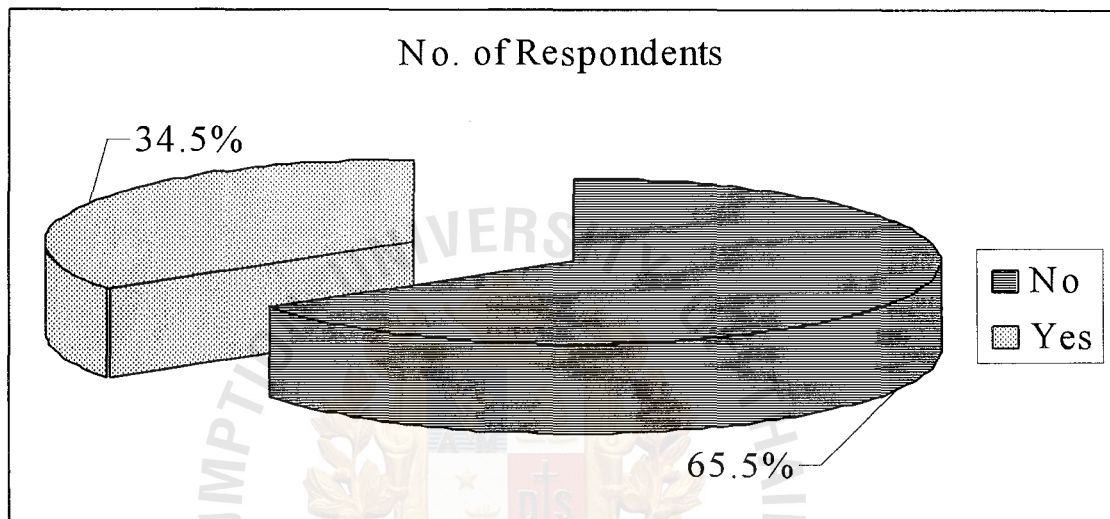| Answer	No. of Respondents	Percentage
No	249	65.5
Yes	131	34.5
Total	**380**	**100**

Figure B.39.   Factor Influences the Respondents' Non-trial Based on Fare.

Based on Question No.11, Which factors that affect your decision not to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 131 from 380 = 34.50%, and

No for 249 from 380 = 65.50%.

The answer indicated that 34.50% of 380 respondents agree that fare in using Mahanakorn underground train service is the factor that affects their decision not to choose Mahanakorn underground train for their transportation.

Table B.45.   Factor Influences the Respondents' Non-trial Based on Service.

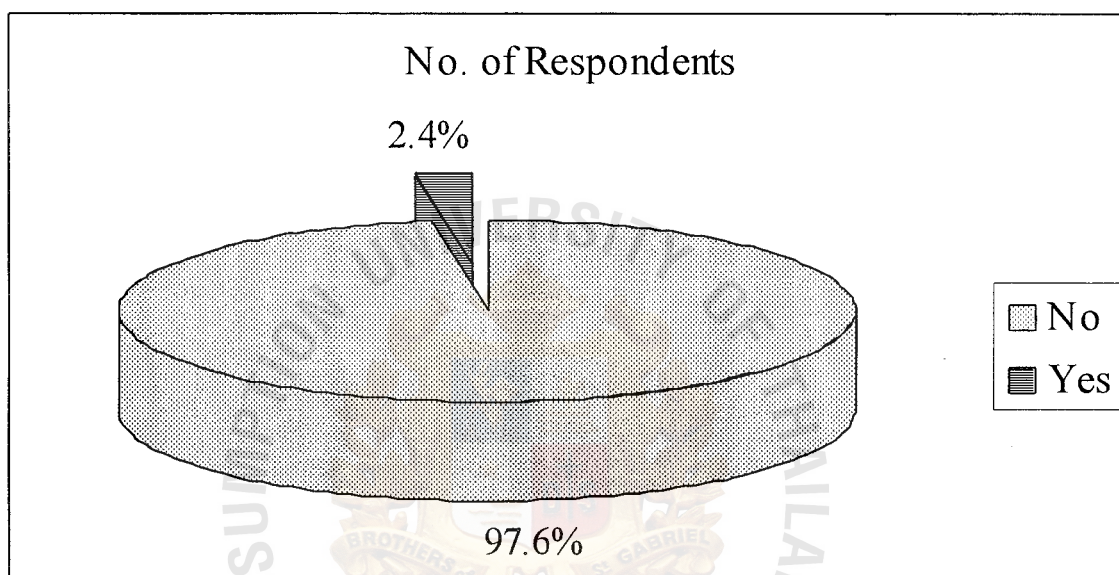| Answer	No. of Respondents	Percentage
No	371	97.6
Yes	9	2.4
Total	**380**	**100**

Figure B.40.   Factor Influences the Respondents' Non-trial Based on Service.

Based on Question No.11, Which factors that affect your decision not to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 9 from 380 = 2.40%, and

No for 371 from 380 = 97.60%.

The answer indicated that 2.40% of 380 respondents agree that service is the factor that affects their decision not to choose Mahanakorn underground train for their transportation.

Table B.46.   Factor Influences the Respondents' Non-trial Based on Inconvenience.

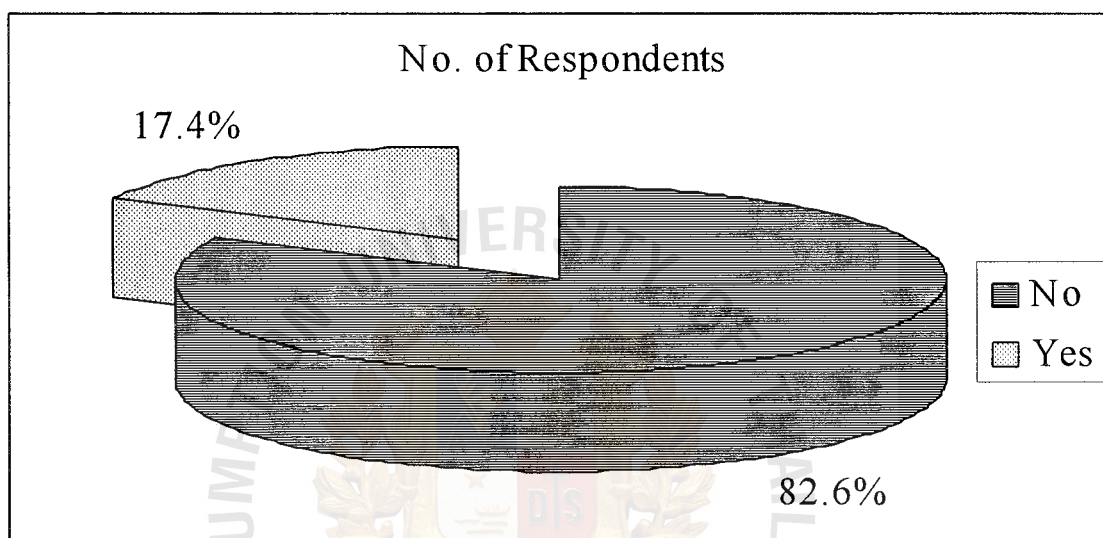| Answer	No. of Respondents	Percentage
No	314	82.6
Yes	66	17.4
Total	**380**	**100**

Figure B.41.   Factor Influences the Respondents' Non-trial Based on Inconvenience.

Based on Question No.11, Which factors that affect your decision not to choose

Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 66 from 380 = 17.40%, and

No for 314 from 380 = 82.60%.

The answer indicated that 17.40% of 380 respondents agree that the

inconvenience in using Mahanakorn underground train service is the factor that affects

their decision not to choose Mahanakorn underground train for their transportation.

Table B.47. Factor Influences the Respondents' Non-trial Based on Safety.

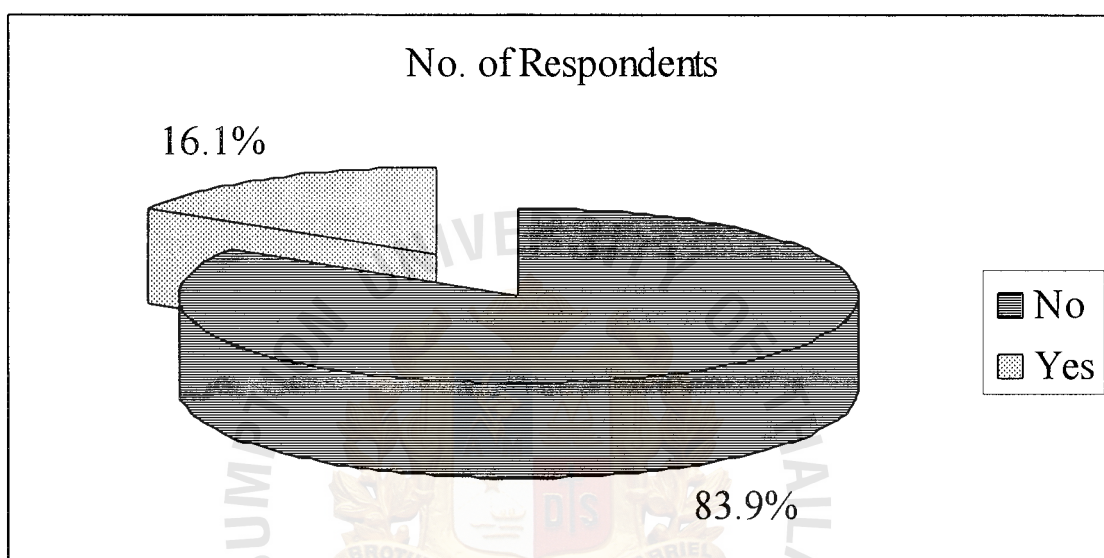| Answer	No. of Respondents	Percentage
No	319	83.9
Yes	61	16.1
Total	**380**	**100**

Figure B.42. Factor Influences the Respondents' Non-trial Based on Safety.

Based on Question No.11, Which factors that affect your decision not to choose

Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 61 from 380 = 16.10%, and

No for 319 from 380 = 83.90%.

The answer indicated that 16.10% of 380 respondents agree that safety in using

Mahanakorn underground train service is the factor that affects their decision not to

choose Mahanakorn underground train for their transportation.

Table B.48.   Factor Influences the Respondents' Non-trial Based on Routes Not Covering or Near Their Destinations.

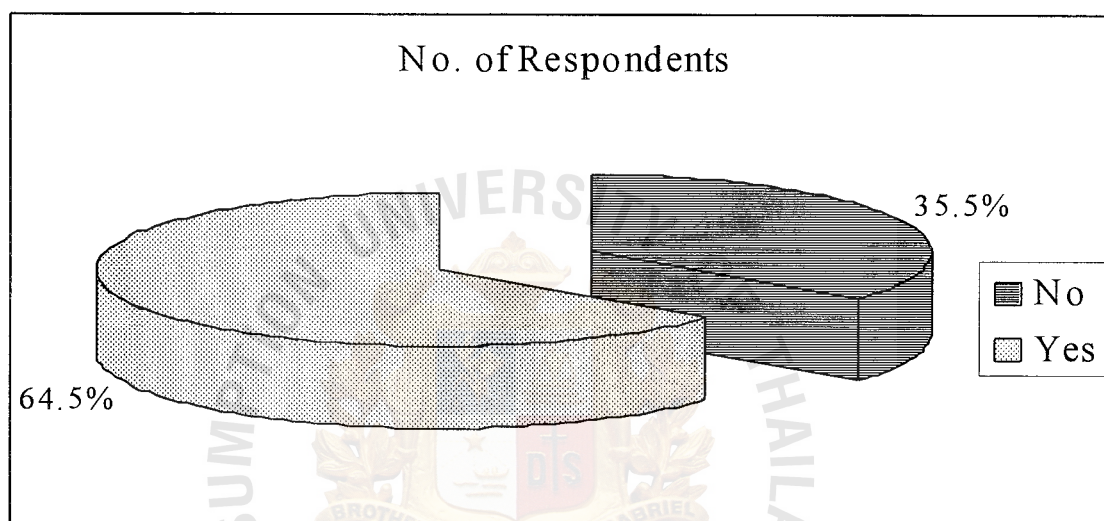| Answer	No. of Respondents	Percentage
No	135	35.5
Yes	245	64.5
Total	**380**	**100**

Figure B.43.   Factor Influences the Respondents' Non-trial Based on Routes Not Covering or Near the Destinations.

Based on Question No.11, Which factors that affect your decision not to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 245 from 380 = 64.50%, and

No for 135 from 380 = 35.50%.

The answer indicated that 64.50% of 380 respondents agree that the route not cover or near their destinations is the factor that affects their decision not to choose Mahanakorn underground train for their transportation.

Table B.49.   Factor Influences the Respondents' Non-trial Based on Other Reasons.

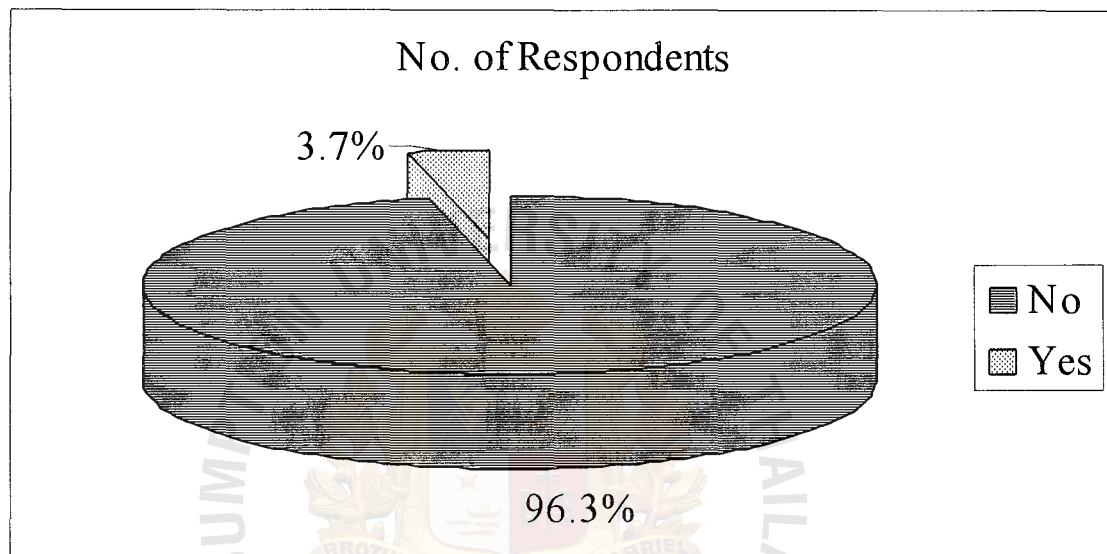| Answer	No. of Respondents	Percentage
No	366	96.3
Yes	14	3.7
Total	**380**	**100**

Figure B.44.   Factor Influences the Respondents' Non-trial Based on Other Reasons.

Based on Question No.11, Which factors that affect your decision not to choose Mahanakorn underground train for their transportation?

The answer from 380 respondents are presented below:

Yes for 14 from 380 = 3.7%, and

No for 366 from 380 = 96.30%.

The answer indicated that 3.70% of 380 respondents agree that there is other factor that affect their decision not to choose Mahanakorn underground train for their

transportation that is their own private car is more convenient and more private.

Table B.50.   Influencing Factors on the Facilities.

	Mean	Standard Deviation
1. Facilities for the disabled	5.503	2.542
2. Buses available for the passengers to the underground train stations	3.032	2.312
3. Parking Lots	4.021	2.483
4. Toilettes	3.958	1.807
5. Escalators	4.308	1.604
6. Elevators	5.563	1.798
7. Guideboard/ Signpost	3.411	1.799
8. Convenient Stores	6.211	1.698

Based on Question No.12, In your opinion, what are the priorities of the facilities you prefer? The respondents rank the priority they give the importance according to their needs by numbering them from 1, that means the most important up to 8, that means the least important to them.

The answer from 380 respondents shows that they give the most priority of the facility towards the convenient stores which its mean is 6.211 and its standard deviation is 1.698.

Table B.51. Respondents' Expectation towards the Service and the Facilities.

	Mean	Standard Deviation
1. Routes cover your destination	4.276	0.972
2. Waiting period for each underground train	3.921	0.815
3. Fare rate	3.937	0.899
4. Convenience	4.174	0.738
5. Cleanliness	4.089	0.721
6. Service	4.105	0.789
7. Fastness	4.342	0.707
8. Safety	4.545	0.638
9. Arrival and departure on time	4.361	0.688

Based on Question No.13, How much is your expectations towards the service and the facilities you receive from Mahanakorn underground train project?

The respondents show their expectations towards the service and the facilities from Mahanakorn underground train project by giving the least or, little or, fair or, much or, the most importance to each one.

The answer from 380 respondents shows that they give the most expectations towards the service and the facilities towards the safety that its mean is 4.545 and its standard deviation is 0.638.
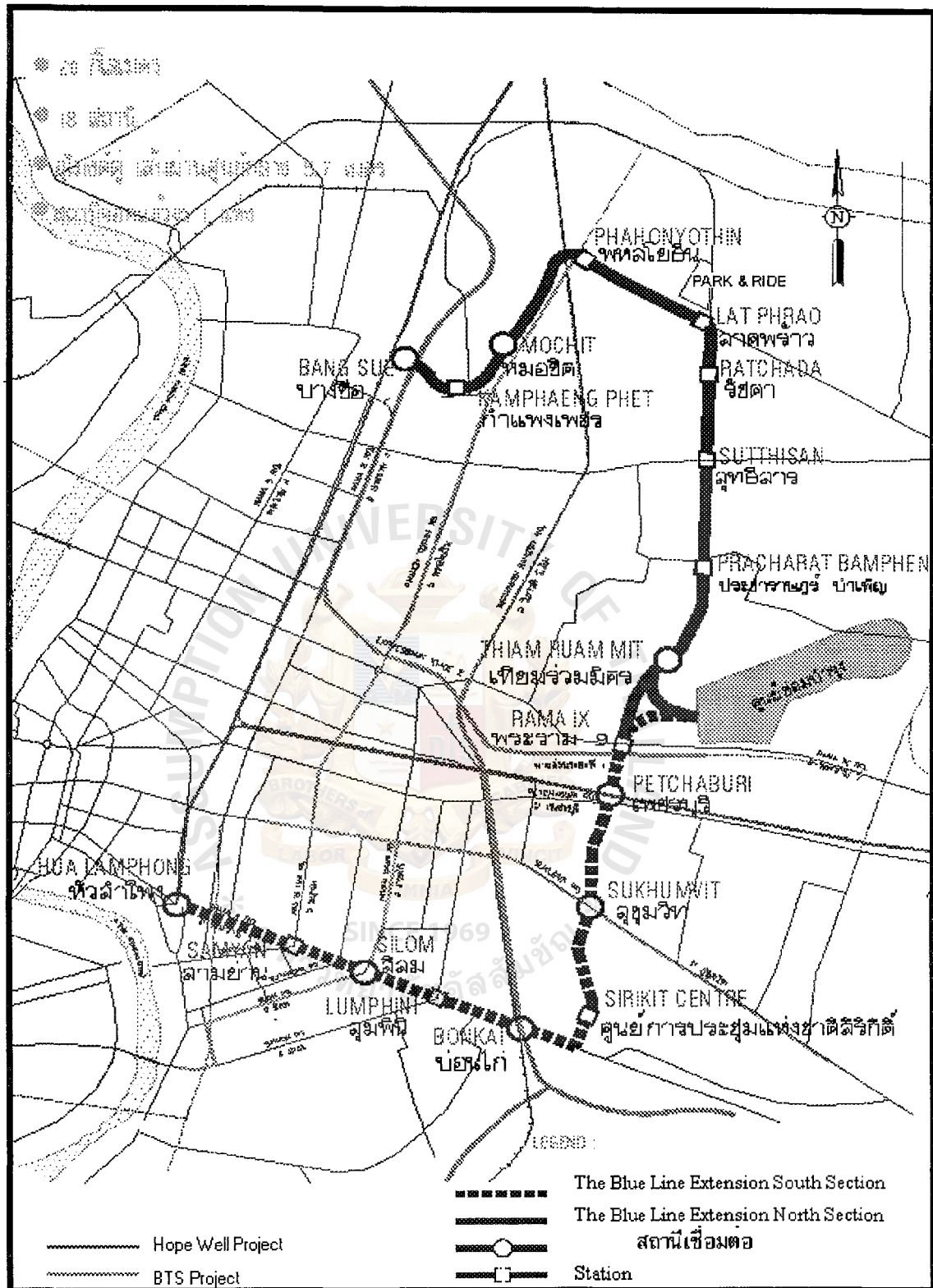
APPENDIX   C

THE MRTA ROUTES

Figure C.1.   The MRTA Routes.

BIBLIOGRAPHY

1. Gay, L. R. and P. L. Diehl. Research Methodology for Business and Management. Singapore: Simon & Schuster (Asia), 1996.

2. P., Chongsanguan. Metropolitan Rapid Transit Authority's Annual Report 1999. Bangkok: Phittaya Printing, 2000.

3. P., Chongsanguan. Metropolitan Rapid Transit Authority's Annual Report 2000. Bangkok: Phittaya Printing, 2001.