Determinants of Public Transport Service Effectiveness in Addis Ababa City

By

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A Thesis Proposal submitted to the Addis Ababa University, School of Commerce for the Partial Fulfillment of the Requirements for Master of Arts Degree in Logistics and Supply Chain Management

Advisor: Busha Temesgen (Ph.D.)

Addis Ababa, Ethiopia

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Addis Ababa University

School of commerce

Department of Logistics and Supply Chain Management

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CERTIFICATE OF ORIGINALITY

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

Signature: _____ Date: _____

Addis Ababa University
School of Graduate Studies

This is to Certify that the thesis prepared by **Sintayehu Likisa Shanko** entitled: **Determinants of Public Transport Service Effectiveness in Addis Ababa City** submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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LIST OF ACRONYM

IOT: Internet of things

EI: Effectiveness Indicator

TPMO: transport program management office

PT: Public Transport

IEI: Infrastructure Efficiency Indicator

Abistract

Transportation is important in the social and economic development of any country, but is especially critical in developing economies where mobility and accessibility are frequently constrained because of insufficient provision of appropriate levels of transport services. This research focuses on listing down determining factors with there measuring parameters. Also this paper is here to fill the theoretical gap by listing Public Transport Effectiveness determinants in there severity order. The data needed for the research will be collected using questioners. The questioner will list the probable causes of public transport ineffectiveness and asks participants to rank the potential factors that cause the public transport ineffectiveness in Addis Ababa.

According to the study's finding, all the factors that are identified as the determinants for an effectiveness of public transport and the service quality dimensions are found to be significant in their contribution. From the finding, it can be seen that the variables that are identified contributes 39.6% of for the effectiveness. From this result, it can be concluded that there is a strong relationship the determinant factors their contribution for effectiveness. Then, working on this parameters identified will help the public transport service givers to excel their services.

It is recommended that establishing a system to evaluate the service quality standing from the results is helpful for the organizations to improve. Allowing training and coaching platform should be arranged, so that inexperienced drivers and attendants will gain knowledge on how to give service, complain management, service excellence and other issues. Training on driving skills, communication skill, complain management in general can make a vital contribution towards improving on public transport service enhancement.

CHAPTER ONE

1 INTRODUCTION

BACKGROUND OF THE STUDY

Transportation is important in the social and economic development of any country, but is especially critical in developing economies where mobility and accessibility are frequently constrained because of insufficient provision of appropriate levels of transport services. Urbanization, driven by newfound economic affluence, rural-urban migration, and limited urban planning and governance infrastructure capacity has resulted in growing urban sprawl (Loh & Brieger, 2013). Public transport is also called mass transportation, mass transit or simply a transit, which is defined as is a system of transportation for passengers.

When we see what does it means by public transport in case of the world it's good to see some examples. In case of Sweden: Strong forces at the local and regional government levels argue for the importance of good living conditions in terms of economic well-being and beneficial business conditions. Citizens expect acceptable income levels and good local services a combination that is often referred to as "welfare". Local and regional politicians are expected to ensure that people have a good life at home and at work, and one in which conditions continue to develop; that is, a life in which there is some kind of growth. Transport system challenges can be economic, environmental or social in character. Within the last decades, society has witnessed a fundamental change, as urbanization progresses faster than ever before. The global number of people living in urban areas (54 per cent in 2014) exceeds the number of people living in rural areas, and urbanization is expected to continue in coming decades. This study shows that how important is to focus on public transportation development and increasing its effectiveness (Stjernborg V, Mattisson O: 2016;).

Public transport services are generally regarded as being of low quality in many developing cities, with Johannesburg being a typical example of a city with few government funded public transportation services and relatively low levels of mobility and accessibility. As cities in developing countries grow, the provision of reasonable levels of public transport becomes ever more crucial to the functioning of the city, particularly in major cities with high population growth rates like Johannesburg In Johannesburg private motor cars are the dominant form of commuter transport and, as the population growth rate is in double figures annually, the city, which is already congested, is destined to become gridlocked. Given the rapid urban growth of the City of Johannesburg and systemic underinvestment, the city's transportation system is now characterized by congestion and associated issues such as pollution, accidents, public transport decline, environmental degradation, climate change, energy depletion, visual intrusion and lack of accessibility for the urban poor. (Luke, Rose & Heyns, Gert. 2019).

When it comes to our country Ethiopia the public transport system is getting governed by Addis Ababa City Transport Authority Office. As Addis Ababa is a developing country with low income population the demand for choosing Public Transport is high. The urbanization process increase substantially the demand for urban transport also increases. Urban transport has a great role in the transformation of society and facilities modernization at large. Urban transport is usually accepted that cities are the engines of economic growth in most developing as well as developed countries. Transportation service is sensitive to the characteristics and performance of each mode of transportations. The following variables like Accessibility, travel cost, travel time, travel time, and income level are the most determining factors of modes choice. From the different modes of transportations in Addis Ababa city, the Minibus taxi is the most chosen transport mode in the city even if its travel cost is high as compared to other public transport. This paper tries to assess the existing operational and financial performances of Anbessa City Bus Service Enterprise (ACBSE) and Sheger City Buses.

One of the critical problems in Addis Ababa is the lack of efficient public transport. This is despite the fact that government has been deploying various schemes, such as introduction of Higer, Bishoftu, and double-decker buses; and constructing Sub Sahara's first light railway with billions in investment and subsidies every year.

These initiatives have been unable to sufficiently ease the transport crisis. While officials stress the government is doing its best to execute projects that expand mass transportation, experts argue that transport sustainability can only be guaranteed through proper planning that takes into account factors like urbanization and changes in land use. (https://ethiopianbusinessreview.net/Public Transport in Addis From Crisis through Crisis, into Crisis, 2022)

Statement of the Problem

Public transport is the best means of transport to use in a cities like Addis Ababa. Addis Ababa is a city with high traffic movement and high population density. This problem happens when the network to manage this urban transport can no longer to accommodate the movement that the roads can handle, the man power and can manage and the system can handle. This problems mostly encounter at the peak hours during the day time.

The public transportation system in Addis Ababa is facing a lot of problems and they are infrastructure problems, narrow road, uncontrolled and rapid horizontal expansion of the city. When we see the proximity of the services in most areas people are expected to walk long distance in order to catch the service, the service is not available for newly developed areas in time, accessibility of the service to all groups of the society is constrained by many factors, there is no separate line for bus and even if available not well managed in this narrow and busy road network, the distance between stops is long and not flexible, takes long time in loading and unloading at bus stops.

The buses at peak hours operate by being overcrowded and even by not being closed and people face suffocation, pick pocketing, air born disease. (Demelash Abate Abreha, 2007)

There are researches that are done on Public Transport effectiveness in Addis Ababa. These researches has tried to show determinant factors on transport mode preference and how end users select this preference. This research focuses on listing down determining factors with there measuring parameters. Also this paper is here to fill the theoretical gap by listing Public Transport Effectiveness determinants in there severity order.

Research Question

This thesis is purposed to answer questions that pop up in the daily life of public transport users and public transport service giver. The questions that this research going to answer are:

1. What are the main determinants for public transport services in Addis Ababa?
2. What is the level of service quality in public transport in terms of service quality dimensions?

Research Objectives

This part of the proposal is here to give us an insight on getting the objectives for the paper.

Main objectives

The objective of this research is:

- To identify determinants of public transport service effectiveness in Addis Ababa in terms of service quality dimensions which are Reliability, Responsiveness, Assurance, Empathy, and Tangibility.

Specific Objectives

In addition to the main objective of the research, the research will also encompass specific questions listed below.

1. To identify determinants for the public transport service effectiveness in terms of transport reliability.
2. To identify determinants for the public transport service effectiveness in terms of transport responsiveness.

3. To identify determinants for the public transport service effectiveness in terms of transport assurance.
4. To identify determinants for the public transport service effectiveness in terms of transport empathy.
5. To identify determinants for the public transport service effectiveness in terms of transport tangibility.
6. To prioritize the determinant factors of public transport effectiveness on the bases of their severity.

Significance of the Study

This research will have a broad significance in solving the problems that the public transport is facing and the problem that the public transport service users are facing in there day to day life. The importance of public transport service givers in the socio-economy of one society depends on solving the transportation problems that the community is facing. Then, knowing the determining factors for the public Transport service in Addis Ababa will give a clue for the solutions.

Practical significance

This research:

- Will show the gaps in the area that the public transport service is facing in Addis Ababa and shows their degree of severity.
- Opens a door for policy makers and city administrators on how to revise the transportation policies.

Delimitations/Scope of the Study

The limitations of this research can be seen in geographic, time and cost ways. Addis Ababa is a city with eleven sub cities. It's not possible to reach with this limited time and self-financing research to reach all places.

Then, the scope of this study will be in Addis Ababa city. From the eleven sub cities the research will be conducted by selecting only three sub cities that are Gulele, Kolfe and Yeka and taking sample survey which will lead to some finding.

The other scope of this study will be the type of public transport that it's going to focus on. The public transport types that operates in a city like, private owned Taxis that gives public transport in the city, light rail way transport (Tram) and also there are also buses so called 'Public Service' which gives free service for governmental office employees.

The study is delimited to "Anbessa" and "Sheger" mass transport enterprises the researcher chose "Anbessa" mass transport enterprise and "Sheger" because both operators dominate the public transport market for long having much experience in the sector.

CHAPTER TWO

2 RELATED LITERATURE REVIEW

INTRODUCTION

Public transport (PT) efficiency needs an infrastructure to run it efficiently. Infrastructure Efficiency Indicator (IEI) is a measure of operational excellence in the resource utilization while Effectiveness Indicator (EI) refers to the use of outputs to achieve the passenger interest (Chu at al. 1992). Then by looking at infrastructure effectiveness is defined as, (Mouzas, 2006), efficiency and effectiveness are the central terms used in measuring and evaluating the performance of organizations. The author defines efficiency as a necessary condition that reflects the company's operating margins and effectiveness as the company's ability to reach their objectives regarding the service level. Efficiency and effectiveness of public transport are essential to people's daily lives and to guide public policy.

Public transport as its name implies Public officials do not always act in the best interests of the public. They may instead try to fulfil their own self-interest and/or be under the influence of interest groups (Buchanan and Tullock, 1962, Niskanen, 1971, and Mueller, 2003). It may also be that the industry they are operating within, or trying to regulate, is so complex that it is hard to process the information and actually find the optimal solution.

Technology is playing an important role in today's world (Multisystems, Mundle & Associates, National Research Council, Washington, D.C., 2002) which is the fare-collection strategy can significantly influence public transport operational efficiency and passenger convenience. Ticketing strategies can also be used to attract passengers. There are three key elements of ticketing strategy: ticket sales, ticket types, and ticket control.

Managing the public transport sector is so important in order to deliver expected service for the community. This management can be done through many methods which

Public transport (PT) is an essential means of achieving sustainable economic development for cities and regions. PT reduces energy use, pollution and the space required for mobility. In densely populated areas, PT provides a high level of mobility at low external costs. Most PT systems cannot cover their full operating costs through fares. Therefore, (Ceder A (2007), Amsterdam, Elsevier)

PT systems must improve their efficiency and become more economical. An important technique for improving PT efficiency is to optimize the PT network structure, thus enabling PT service providers to offer high-quality service at low cost. Network optimization is very complex due to the interplay of market orientation, operating costs and investments. For economic reasons, services are bundled spatially into lines and temporally into frequencies or schedules. The result is a network that is highly space and time dependent. In order to make public transport more attractive for the community to use them the government has applied subsidies to the sector. This subsidization has an ability to attract more people to this service Area. (Daly and Zachary, 1977; Goodwin, 1974; Tanner, 1974; Webster and Oldfield, 1974) that for destinations where bus travel is relatively convenient (i.e. to city-centre workplaces), free public transport might attract as much as 20 per cent of current car users.

Government have to share its power in mass public transport service to private sector. This issue wants to be seen in policy amendment of the government (Verma, A. and Dhingra, S.L.(2001), Trieste, Italy, Anno VII, No.18, pp. 4-15) which is a multi-item instrument used for measuring service quality, is used to measure gaps between commuters expectations of urban bus transport services and the actual service quality provided by the Bangalore Metropolitan Transport Corporation (BMTC), this is among the few profitmaking urban public bus transport organizations in India.

In today's world globalization is playing a key role in every sector. Globalization comes to effect by that of digitization. The transportation system is one of them which is influenced and promoted to the next level of performance by this digitization. (Davidsson P, Hajinasab B, Holmgren J, Jevinger Å, Persson JA. *Sustainability*. 2016;)Internet of Things (IoT), with respect to public transport and how it can support

sustainable development of society. Environmental, economical, and social perspectives are considered through analysis of the existing literature and explorative studies. It's visible that there are great opportunities for both transport operators and planners, as well as for the travelers. It's good to analyze a number of concrete opportunities for each of these actors. However, in order to realize these opportunities, there are also a number of challenges that needs to be addressed. There are both technical challenges, such as data collection issues, interoperability, scalability and information security, and non-technical challenges such as business models, usability, privacy issues, and deployment.

Major determinants of public transport are cost of travel which makes people choose a mode of transport which is cheaper and affordable based on their economic status. However price is subsided by factors like urgency and social class.

Travel time is also another important determinant of public transport. It refers to the time it takes to move from one place to the other. Depending on the travel time, people may be forced to choose different modes of transport. Shorter distances can be commuted by buses or cars while longer ones may require air transport.

The economic development of the society or the county is also a major factor that determines the choice of transport. People of high economic status may opt for air transport while those from low economic status choose public transport. Sometimes, even if there are people who can afford costlier forms transport, the infrastructure may be poor given the overall economic development of the country. (Best essay services, 2016)

Public Transport Effectiveness

Public Transport Effectiveness is the way used to evaluate the performance of individual bus lines composing the public transport network. Effectiveness of Public Transport depends on Traffic conditions and population density.

Effectiveness of public transport can be measured using parameters like Reliability, Responsiveness, Assurance, Empathy, and Tangibility.

There is a model called Data Envelopment Model (DEA)

Determinants of Public Transport Effectiveness

Cost of travel:

The literature shows that the 'cost' is one of the main determinants of PT demand (Albalate and Bel, 2010). Souche (2010) also pointed to two structural variables that stand out from the others, one of which is the user cost of transport-by public transport and private car.

Travel time:

It is one of the most leading factors that influence the use of PT and choice of transport mode. The importance of time comes from its structural attributes. As pointed out by Walle and Steenberghen (2006), unlike price and other factors, the time is an absolute constraint because people cannot increase the time spent on traveling indefinitely (Golob et al., 1972). (Alemayehu, 2022)

Walk (access) time and accessibility of transport services:

A significant factor in PT demand is the access time or distance that someone should overcome to get to a service stop. The use of PT involves walking to/from home (or office or school, etc.) or transfer between vehicles or modes. (Wardman, 2004)

Waiting time:

Waiting time is another main component in the travel time. The waiting time measures the actual duration of waiting at the stop (Hauer, 1971).

In-vehicle (journey) time (IVT):

In-vehicle time is a major time component. Given all else being equal, the longer the in-vehicle time, the lower the demand is. When the journey times turns to be longer, the tendency for the search of alternative transport modes increases because it is shorter for some transport modes than it is for others. Hovell and Jones (1975)

Interchanges and legs:

Transfers permitted between PT services at PT points called interchanges (Horn, 1999). It is also called 'transfer time' or 'connection time.' An important portion of PT trips are in form of multi-leg journeys, which is composed of more than one transport mode e.g., walking, bus, light-rail.

Service quality:

The PT providers in the UK paid attention to the service quality in order to maintain market share and increase profitability on a deregulated and privatized market (Pullen, 1993).

Availability and costs of alternative travel modes:

PT demand is also closely related to the availability and costs of alternative travel modes. If the number of alternative transport modes is numerous, the passengers are likely to choose among those alternatives. Alternative (public or private) transport modes have a direct influence (on PT demand) but cross-elasticities (i.e., for the fuel price) also have to be considered (Bresson et al., 2004).

Number of busses on the root

Transport is a basic element of the city life. In many cities PT services are provided by the local authorities (or under the supervision of them) or private companies. Travelers choose which ones to use among the transport mediums or modes available to them. The existing studies such as Bresson et al. (2004) put that the use of PT was quite sensitive to the volume supplied.

Economic factors:

Economic factors such as the level of household income, employment rate and the general level of wealth in a country are also among the main determinants of the PT use. Bresson et al. (2002) stated that transport demand, by definition, depended on household income and transport price.

Public transport effectiveness measuring dimensions (Service quality dimensions)

The public transport service needs to be measured using quality service parameters. This dimensions are

Reliability

Reliability is defined as the ability to perform the promised service dependably and accurately. In broad sense reliability means, service firms' promises about delivery, service provisions, problem resolutions and pricing. Customers like to do business with those firms, who keep their promises. So it is an important element in the service quality perception by the customer and his loyalty. Hence the service firms need to be aware of customer expectation of reliability. In the case of banking services, the reliability dimension includes - regularity, attitude towards complaints, keep customers informed, consistency, procedures etc. (Shamsuddoha, Mohammad. (2003)).

Reliability Ability to perform the promised service dependably and accurately. (Zeithaml and Bitner, 1996)

Reliability can also be measured using the following quality instruments:

- Credibility:
- Timely service:
- Accuracy of records:
- Dependability:

Responsiveness

Responsiveness is the willingness to help customers and to provide prompt service. This dimension focuses in the attitude and promptness in dealing with customer requests, questions, complaints and problems. It also focuses on punctuality, presence, professional commitment etc., of the employees or staff. It can be calculated on the length of time customers wait for assistance, answers to questions etc. The conditions of responsiveness can be improved by continuously view the process of service delivery and employees attitude towards requests of customers. (Shamsuddoha, Mohammad. (2003)).

Responsiveness Willingness to help customers and provide prompt service. (Zeithaml and Bitner, 1996)

Assurance

The third dimension of service quality is the Assurance dimension. It can be defined as employee's knowledge, courtesy and the ability of the firm and its employees to inspire trust and confidence in their customers. This dimension is important in banking, insurance services because customers feel uncertain about their ability to evaluate outcome. In some situations like insurance, stock broking services firms try to build trust and loyalty between key contact persons like insurance agents, brokers etc and individual customers. In banking services "personal banker" plays the role of key contact person. This dimension focuses on job knowledge and skill, accuracy, courtesy etc of employees and security ensured by the firm. (Shamsuddoha, Mohammad. (2003)).

Assurance Employees' knowledge and courtesy and their ability to inspire trust and confidence. (Zeithaml and Bitner, 1996)

Empathy

Another dimension of service quality is the Empathy dimension. It is defined as the caring, individualized attention provides to the customers by their banks or service firms. This dimension try to convey the meaning through personalized or individualized services that customers are unique and special to the firm. The focus of this dimension is on variety of services that satisfies different needs of customers, individualized or personalized services etc. In this case the service providers need to know customers personal needs or wants and preferences. (Shamsuddoha, Mohammad. (2003)).

Empathy Caring, easy access, good communication, customer understanding and individualized attention given to customers. (Zeithaml and Bitner, 1996)

Tangibility

The fifth dimension of service quality is the Tangibility which is defined as the appearance of physical facilities, equipment's, communication materials and technology. All these provide enough hints to

customers about the quality of service of the firm. Also, this dimension enhances the image of the firm. Hence tangibility dimension is very important to firms and they need to invest heavily in arranging physical facilities. (Shamsuddoha, Mohammad. (2003)).

Tangibles Appearance of physical facilities, equipment, personnel and written materials. (Zeithaml and Bitner, 1996)

Taken from (Shamsuddoha, Mohammad. (2003)).

Table 2.1: service quality dimensions and their respective items

Dimensions	Quality instruments
Reliability	Dependability Timely service Accuracy of records
Assurance	Staff 's knowledge Politeness of staff Staff 's courtesy Trustworthiness and confidence
Tangibles	Bus stops at reasonable distance Staff 's professional appearance Shades at stops
Empathy	Good communication Individual attention Customer understanding
Responsiveness	Staff conduct Willingness of staff to help customers To provide prompt of service

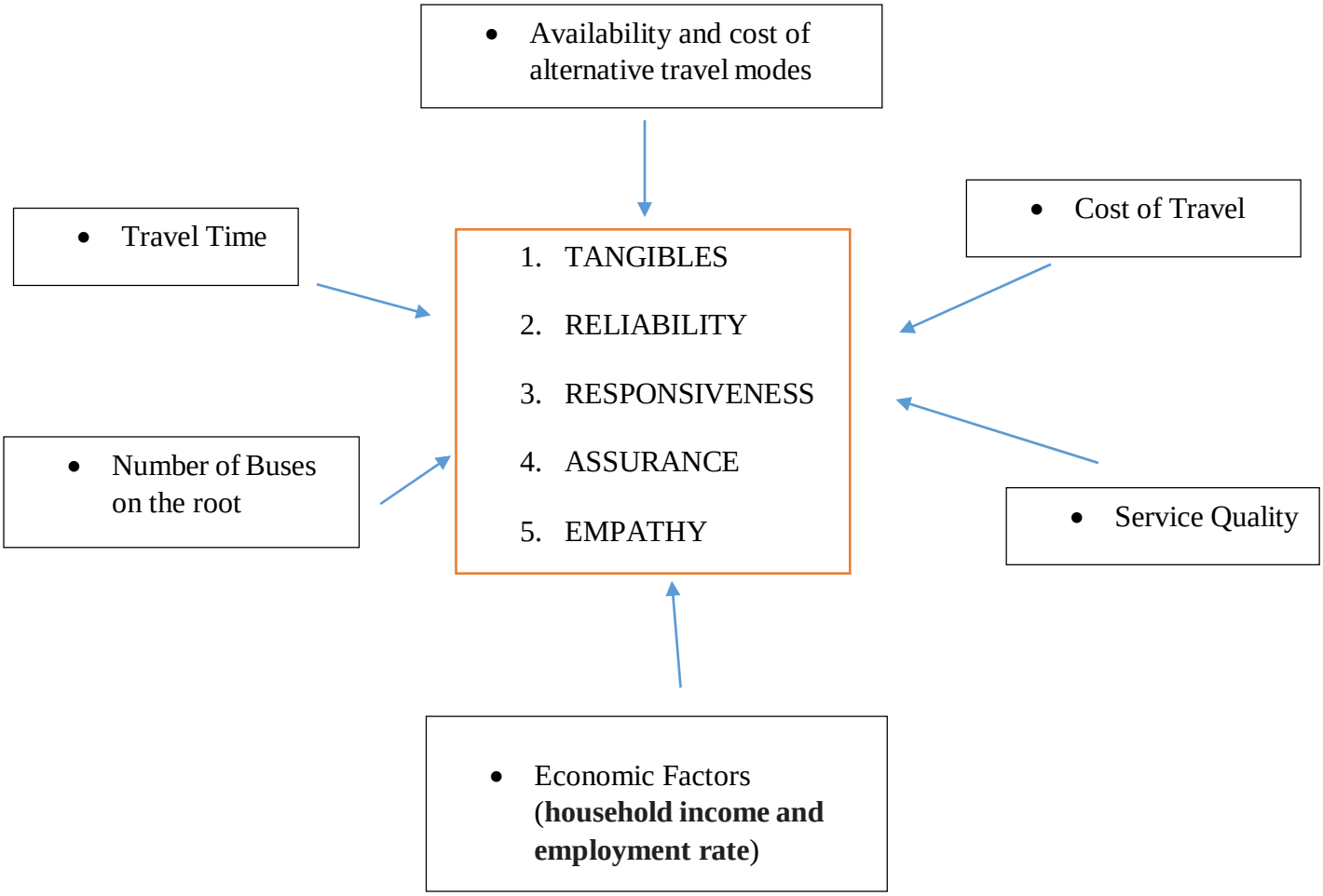
Empirical Frame Work

There is a study that is conducted in Czech Republic under the title of "Determinants of urban public transport efficiency: case study of Czech Republic". Under this study the finding gives us the determinants that increase efficiency of Public Transport are identified as proportion of drivers, Average Vehicle Age, the presence of tramlines in the city, total vehicle kilometers and population density. Some variables are identified as those that decrease efficiency – ticket price, proportion of subsidies in revenues and presence of two city system. (Fitzova, H., Matulova, M. & Tomes, Z. Eur. Transp. Res. Rev. 10, 42 2008)

Conceptual Frame Work

The theoretical framework is conceptualized as stated bellow as per the information gathered from the study of (Albalate and Bel, 2010). The factors on left are independent variables that are supposed to have an effect on the dependent variables shown on the right

Figure 2.1: Conceptual framework of the study



CHAPTER THREE

3 METHODS OF THE STUDY

The data needed for the research will be collected using questioners. The questioner will list the probable causes of public transport ineffectiveness and asks participants to rank the potential factors that cause the public transport ineffectiveness in Addis Ababa. The Likert scale will be used to gauge the opinion of the participant. The sample design follows a non-probability sampling technique. The questionnaire to be developed is more of a technical type, which calls for it to be administered to experts and people directly involved in the sector and service.

Research Approach

The research approach for this study will be both qualitative and quantitative, which is known and named mixed method approach. As this research uses questioners, observation and written records the qualitative approach will be used. And also for the numerical and statistical issues to be answered throughout this research quantitative approach will be used.

Type/Design of Research

The research design will follow the descriptive and explanatory research design. This research design type is used because this paper is going to list the determinants for the public transport effectiveness and will explain the situation or case in depth.

Sample Design

This paper is designed to scope the geography of Addis Ababa, and it's vast to use the whole set of Addis Ababa population for the study. Then it's good to select three Sub Cities from the whole population. Addis Ababa is a city with a population of over 5,227,000 as per the survey done by world population review in 2022 (World population review, 2022), then, it's important to select the targeted respondents out of this population. The population size selection is described below.

Population and sampling

As the study is going to be conducted on public transport users in Addis Ababa city the population size is going to be determined as follows. (Survey Monkey, 2022)

$$samplesize = \frac{\frac{z^2 p(1-p)}{e^2}}{1+\left(\frac{z^2 p(1-p)}{e^2 N}\right)} \qquad Equation\ (1)$$

Where N=population size, e=margin of error, z= z score

The confidence interval used in this research is 95% with error of margin of 0.05. When plugging in these figures with a population of 2,500,000 (Transport Bureau of Addis Ababa, 2021/22 report), the above formula gives a sample size of 385 people. The population size of 2,500,000 is reached by considering public transport service users of Addis Ababa City.

By this the researcher decides to use cluster sampling method. There are 11 sub cities in Addis Ababa and I choose three of them (Gulele, Kolfe and Yeka) which is almost 30% of the sub cities. Convenience sampling is also there as geographical proximity, accessibility and availability are an issue. This research also planned to include only public transport service end users.

Source of Data Collection

It's planned to use both primary and secondary sources and also both qualitative and quantitative type of secondary data are relevant for the study. Primary sources will going to be collected through written questioner which will be distributed with a consideration of the sample size.

For the secondary data type it will be okay to consider previous recordings by Addis Ababa City Public Transport Service and some international literatures.

Research Instruments

As it's mentioned earlier the study uses both primary and secondary data and in order to get all this using research questioner is planned option. Research questioner needs to be prepared in a standard form by using English language.

Data Collection Procedures

The method of data collection is done by using both digital technology (with the help of electronic questioner) and manually. Among the digital technology distributing the questioner by E-mail and telegram. For the manual method of collection face to face interview and filling the questioner are an option.

Methods of Data Analysis

Both descriptive and inferential statistics such as percent, frequency, mean, standard deviation and regression analysis will be computed to analyses the study with the help of SPSS software.

Validity and Reliability

Validity

For parameters best described in ordinal scale, the spearman correlation coefficient measures directional and strength of conformity between two variables. (Laerd statistics, 2021). The spearman's correlation coefficient is very suitable for attitude measuring scales like the Likert's. The spearman's correlation is here used in testing the validity of the questionnaires. A spearman correlation coefficient always lies between -1 and 1. These two values indicate strong correlation between the two variables while the values in between could have different meanings based on the magnitude of the coefficient. (Patrick S. P. and Boer C, 2018)

Table 3.1 correlational coefficient table

Absolute value of the correlation coefficient	Interpretation
0.00-0.10	Negligible correlation
0.10-0.39	Weak correlation
0.40-0.69	Moderate correlation
0.70-0.89	Strong correlation
0.90-1.00	Very Strong correlation

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$ Equation (2)

Where ρ is the spearman's correlation coefficient, di is the difference between two ranks of each observation, n is the number of observations.

Reliability

Reliability of the questionnaire test can also be calculated using statistical parameters. The most used parameter to test reliability of research instrument is the Cronbach's alpha parameter. (Taber, K.S., 2018). The same author after going through academic papers reported Cronbach alpha factor 0.7 and above indicates a good measure of reliability. Hence, the same level (α0.7 and above) will be secured in this study.

Ethical Considerations

Ethical standards should be given due attention and consideration when dealing with respondents, storing their information and preparing the report. The questionnaire to be prepared will have a section that guarantees the privacy of respondents. For instance, respondents will not be identified by their name or alias, rather a single identifier (usually a numerical value) will be attached to each respondent for confidentiality of information.

Moreover, there will be a consent form that guarantees the respondent's responses. Personal information will not be used for any other purposes other than what this research requires. Unless that consent is provided by the respondent, further data collection will not go ahead.

The introduction section in the questionnaire needs to reveal the main objective of the research, how the data will be used and other important information like how long it takes to complete one session and how such research undertakings help the individual and the community.

Another issue when it comes to surveys is the protection of respondents from any physical or psychological harm. In any way possible, the researcher will not press respondents to the level that causes stress or any psychological unrest. Since the identity of the respondent will be entirely unanimous, the methodology will automatically prohibit the researcher from such activities.

CHAPTER FOUR

4 DATA ANALYSIS AND INTERPRETATIONS

This chapter encompasses the data analysis, interpretation and presentation of the results. The analysis comprised of both descriptive and explanatory statistics in which the former describes the demographic profile of respondents' analysis of responses under each attribute; whereas the latter includes scale reliability test; correlation and multiple regression Analysis.

Questionnaire Participant information

The main aim of the study is to assess the determining factors for the effectiveness of public transport in Addis Ababa city. In order to achieve this objective, the researcher has gathered data through questionnaires, interviews, and secondary data sources. This chapter provides the output of the research as data presentation, analytic results, and discussion of findings derived from data gathered. Based on sample calculation, a total of 385 questionnaires were distributed. From the questionnaires 331 were returned with a Response Rate (RR) of 85.97%.

Demographic Information of respondents

The primary data was collected through a self-administered questionnaire. Accordingly, 385 questionnaires were distributed to population of Addis Ababa city with 331 completed and returned, accounting for 85.97% of the total number of questionnaire sent out.

As shown in the demographic data table (table 4.1), which shows that the 59.8% 0f respondents were male and 40.2% were female. Regarding the age category, 2.4% of respondents fell under the age group 18 years; the highest number of respondents (71.3%) were in the age range of 18-35 years; 22.1% were in the age range of 36-50 years old and 4.2% above 50 years of age. The age distribution of the respondents revealed that the majority of respondents are in the younger age group. Accordingly, 5.1%

below diploma, 15.7 diploma, 61.3% and 17.8% of respondents have a first degree and an MA/MSc degree and above, respectively.

Table 4.1: Respondent's demographic data

Classification	**Rate of recurrence %**	
Sex		
Male	192	58.0
Female	139	42.0
Total	331	100
Age		
Bellow 18	9	2.7
18 to 35	235	71.0
36 to 50	79	23.9
Above 50	8	2.4
Total	331	100
Educational status		
Bellow Diploma	19	5.7
Diploma	54	16.3
First Degree	206	62.2
MSc. and Above	52	15.7
Total	331	100

Descriptive Statistics on independent variables:

The respondents were requested to express their opinions on determining factors for public transport effectiveness and service quality dimensions regarding the public transport service in Addis Ababa city. A five-point Likert scale was used to evaluate the responses the following statements were provided to

determine their level of agreement with the statements for each dependent and independent variable. A summary of descriptive analysis for each variable is presented as follows.

Ticket Price

There were three main features of personal traits that were assessed. As shown in the following table (table 4.2), the respondent's opinion about ticket price on the public transport in Addis Ababa city shows an agreement. The results shows that almost all of the respondents agreed or strongly agree with the statement that are set as an item.

Table 4.2: Descriptive statistics for Ticket price

Cost of travel is determining factor for public transport effectiveness.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Ticket price for the service match with the service that you get.	**19**	**5.7**	**31**	**9.4**	**46**	**13.9**	**149**	**45.0**	**86**	**26.0**
Ticket price is affordable for all of the community.	**17**	**5.1**	**43**	**13.0**	**50**	**15.1**	**142**	**42.9**	**79**	**23.9**
Government subsidies on the service is satisfactory.	**33**	**10.0**	**57**	**17.2**	**91**	**27.5**	**110**	**33.2**	**40**	**12.1**

Ticket price for the service match with the service that you get:

Under this statement there are 19 respondents that account for 5.7% and 31 respondents that has a percentage of 9.4% which says “strongly disagree” and “disagree” respectively. This two groups gives a sum of 50(15.1%) respondents. That means the service that they gets not matching with

the price of ticket that they pay for the trip. This shows that the price of the ticket is expensive as it is compared with the service that an individual gets. Then 149(45%) of respondents says "Agree" and 86(26.0%) of respondent shows there strong agreement towards this statement. This two groups gives a sum of 235(71.0%) respondents. The majority of respondents agree that ticket price is fair as it's compared with the service provided by PT service providers that are covered by this paper scope.

Ticket price is affordable for all of the community:

This second feature that is included to measure how determining the ticket price on determining the PT effectiveness assesses affordability. And among the 331 respondents 17(5.1%) says "strongly disagree" and 43(13.0%) says "Disagree". The total number of respondents that shows disagreement are 60 and this accounts for 18.1% of the total 331 respondents. 142(42.9%) respond "Agree" and 79(23.9%) says "Strongly Agree". This numbers indicates the affordability of ticket price on PT service users is an agreed term with a total of 221(66.8%) agreed respondent rate out of the total.

Positive response rate of 66.8% tells us and explains that the ticket price in Addis Ababa city PT service is affordable. As indicated on literature part the economic status of the population is low and the affordability of ticket price means a lot for the community.

Government subsidies on the service is satisfactory:

This parameter is set there to evaluate the users response regarding government subsidy on ticket price of Anbasa and Sheger buses. This is knowledge and attitude question towards the availability and knowledge towards the government subsidies. There are 90 respondents which is 27.2% has responded "Disagree" and "Strongly Disagree". There are a total of 150 respondents

that is 45.3% respond “Agree” “Strongly Agree” in aggregate and 91 respondents that respond neutral which is account for 27.5% of respondents.

This result shows that users of PT in Addis Ababa city agree with the statement that says “Government subsidies on the service is satisfactory.”

Travel Time

There are three main features that were identified to assess the time that PT buses takes to travel from point A to B, there arrival time and time for loading and unloading. As shown in the following table (table 4.3), the respondent's opinion about travel time on the PT in Addis Ababa city shows an agreement.

Table 4.3: Descriptive statistics for Travel Time

Travel Time is determining factor for public transport effectiveness.	***Strongly Disagree***		***Disagree***		***Neutral***		***Agree***		***Strongly Agree***	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Buses have specific arrival time at each bus stop.	**59**	**17.8**	**94**	**28.4**	**83**	**25.1**	**76**	**33.0**	**19**	**5.7**
The time that you spend to travel from point A to B is acceptable.	**47**	**14.2**	**95**	**28.7**	**88**	**26.6**	**91**	**27.5**	**10**	**3.0**
Buses spend fair time on loading and unloading passengers at their stops.	**32**	**9.7**	**85**	**25.7**	**119**	**36.0**	**74**	**22.4**	**21**	**6.3**

Buses have specific arrival time at each bus stop:

The overall view of buses arrival time of Anbasa and Sheger buses are discussed under this title. Out of the 331 respondents there are total of 153 respondents which is 46.2% has responded

"Disagree" and "Strongly Disagree" and a total of 95 respondents that is 38.7% respond "Agree" "Strongly Agree". There are 83(25.1%) of respondents which responds neutral.

This result shows that users of PT in Addis Ababa city disagree with the arrival time of buses at stations. This factor can associate with other factors that we are going to see throughout this paper. Arrival time is an important issue as its service issue and services have to be timely in order to attract more customers, in order to satisfy the end-users of PT and also users go to stations thinking that the buses are available and planning to reach where they plan timely.

The time that you spend to travel from point A to B is acceptable:

The other question asked under travel time is "The time that you spend to travel from point A to B is acceptable.". This parameter is set to measure customer's satisfaction regarding the travel time. 47(14.2%) of respondents respond 'strongly disagree' and 95(28.7%) of respondents said 'disagree' which is a total of 142(42.9%) respondents out of 331 respondents and 91(27.5%) customers responds 'agree' and 10(3.0%) said 'strongly agree' this makes total of 101(30.5%) of respondents. Out of the total respondents 88(26.6%) responds neutral.

The results above shows that regarding the travel time customers are not happy with the time that they spend while traveling. The time that users are spending takes longer with other circumstances. Even if people are happy with some travel coast issues but the result here says it with the dissatisfactions that they encounter because of the long time that users spend in the buses while traveling from initial to end of particular trip.

Buses spend fair time on loading and unloading passengers at their stops:

Loading and unloading of passengers at the initial station, in the middle of travel and at the end of the travel is the other issue that is addressed under the travel time of PT. A total of 117(35.4%)

of the respondents are on the 'disagree' side and 95 (28.7%) of respondents are on the agree side. Out of the total 331 respondents on this paper 119(36%) of the respondents answer 'neutral'.

This numbers says that there is no significant cut point on this question to say the final word. As most of the respondents are on the disagree side of the Likert scale it is concluded as customers didn't agree with the time that buses takes for loading and unloading of passengers. As buses loading capacity exceeds the standard number set for a particular buses passengers out side have to wait for passengers inside of the bus to take themselves in the buses. Also passengers that are inside of the buses encounter problems to exit as those who are at the get of the buses to enter the bus has created crowd on the gate of buses.

Service quality

Both "Anbesa'' and "sheger" are service giving organizations for the PT users in Addis Ababa city and cities around Addis Ababa. Then to look at how they works examining service quality is must. To examine service quality of the PT in Addis Ababa the following three questions are raised for end-users. As its shown on (table 4.4) the results are set and let's see each of the three one by one.

Table 4.4: Descriptive statistics for Service Quality

Service quality is determining factor for public transport effectiveness.	***Strongly Disagree***		***Disagree***		***Neutral***		***Agree***		***Strongly Agree***	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Cashiers and Drivers are cooperative to serve.	**34**	**10.3**	**62**	**18.7**	**85**	**25.7**	**120**	**36.3**	**30**	**9.1**
Buses are clean and attractive.	**59**	**17.8**	**101**	**30.5**	**76**	**23.0**	**88**	**26.6**	**7**	**2.1**

Number of passengers that the buses hold gives comfort during travel.	**132**	**39.9**	**109**	**32.9**	**42**	**12.7**	**40**	**12.1**	**8**	**2.4**

Cashiers and Drivers are cooperative to serve.

This question is asked to know that how attendants and drivers are cooperative for passengers to help when there is a need. Accordingly out of the total 331 respondents 34(10.3%) responds ‘’strongly disagree’’, 62(18.7%) ‘’disagree’’ 120(36.3%) and 30(9.1%) responds ‘’Agree’’ and ‘’strongly agree’’ respectively.

When we see the aggregate total the 150(45.4%) of respondents scores the highest percentage with the response on agree side. This shows that passenger’s satisfaction regarding the response that they get from attendants and drivers makes them satisfied while they use the service. Getting help while you need it increases customer’s satisfaction and the selection of PT’s for the transport services.

Buses are clean and attractive.

The other parameter set to know the service quality that the PT service givers focused in this study is “buses are clean and attractive”. For this parameter 59(17.8%) respondents go with “strongly disagree” and 101(30.5%) says “disagree” while 88(26.6%) and 7(2.1%) respondents answer “agree” and “strongly agree” respectively. The highest number of respondents lean to disagreement with a total of 160(48.3%) of respondents that says disagree and strongly disagree.

The numbers from the analysis of respondents says that buses are not clean as expected by end-users. One way of satisfying end users comfort is by making buses clean. This points says a lot on what needs to be done.

Number of passengers that the buses hold gives comfort during travel.

This is the last point that is raised under "service quality". This statement is focused to address the number of passengers with that of buses comfort ability. Respondents say is 132(39.9) respondents are "strongly disagree" and 109(32.9) respondents says "disagree" which makes a total of 241 respondents which is 72.8%. This number tells us how discomforting the buses are in terms of number of passengers they hold.

This is observable especially at the pick hours of the day that means in the morning and at the night time. This is because number buses that are ready for the giving service didn't match with the number of passengers. At rush hours people are in hurry to meet their schedule so they are forced to choose the worst.

Availability and cost of alternative travel modes:

this point is raise as one of the determining factor for the public transport effectiveness. There are two factors that are raised under this category. As shown in the bellow table 4.5 the results from respondents are organized.

Table 4.5: Descriptive statistics for Availability and cost of alternative travel modes.

Availability and cost of alternative travel modes is determining factor for public transport effectiveness.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Public transport is affordable as compared to other modes.	**30**	**9.1**	**58**	**17.5**	**64**	**19.3**	**112**	**33.8**	**67**	**20.2**

It's easy to access public transport when it's compared to other modes (trolley, meter Taxis and mid bus taxis).	**35**	**10.6**	**89**	**26.9**	**64**	**19.3**	**106**	**32.0**	**37**	**11.2**
Proximity of bus stops.	**26**	**7.9**	**53**	**16.0**	**119**	**36.0**	**111**	**33.5**	**22**	**6.6**

Public transport is affordable as compared to other modes.

As mentioned in the table shown above the determining factor is defined by other factors as mentioned. 30(9.1%) respondents respond "strongly disagree" and 58(17.5%) respond "disagree" while 112(33.8%) and 67(20.2%) respondents says "Agree" and "strongly agree" respectively.

The factor "Public transport is affordable as compared to other modes" has a highest score on the agree side of the Likert scale. So passengers agree that the affordability of PT as compared with other modes of transport is better.

The public transport have subsidies in many ways that is not going to be covered in this paper but I got it from an interview with experts. This can be why the affordability of the PT is higher.

It's easy to access public transport when it's compared to other modes (trolley, meter Taxis and mid bus taxis).

The scores in the above table shows how accessible the PT buses are as compared with other modes of transportation. Accessibility is one of the key issue when it comes to transportation. The distance of stations from residences and buses cover area can be seen here. As seen in the table a total of 124(37.5%) of respondents are disagree with the statement and a total of 143(43.2%) respondents agree with the statement.

As the highest number of respondents says PT is easily accessible as compared with other modes this makes the mode preferred by passengers. The PT modes cover more area as compared with other modes.

Proximity of bus stops.

Proximity of bus stops is here to see how proximate bus stops from each other and from residents. 36% of respondents are neutral about the proximity of the bus stops and 37.1% of respondents agree.

On the factor that talks about number of buses on each root respondents says they have enough numbers. This implies and goes with this one. When buses are more available on each root they are expected to have bus stops at small distances.

Number of Buses on the root:

This factor that determines the public transport have three items that are here to evaluate number of buses on each roots in Addis Ababa city. This determining factor have three items under it as shown in the table 4.6 bellow.

Table 4.6: Descriptive statistics for number of buses on the roots:

Number of Buses on the root are determining factor for public transport effectiveness.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**

All the roots have enough number of buses ready for giving service.	**60**	**18.1**	**131**	**39.6**	**84**	**25.4**	**49**	**14.8**	**7**	**2.1**
The Public Transport have enough backup buses that are ready when the demand is high.	**71**	**21.5**	**117**	**35.3**	**82**	**24.8**	**52**	**15.7**	**9**	**2.7**
Each bus has enough of seats.	**85**	**25.7**	**97**	**29.3**	**78**	**23.6**	**50**	**15.1**	**21**	**6.3**

All the roots have enough number of buses ready for giving service.

There are 60(18.1%) and 131(39.6) respondents that says “strongly disagree” and “disagree respectively” whereas there are 49(14.8%) and 7(2.1%) of respondents that says “agree” and “strongly agree” respectively. As it can be clearly observed from the numbers a total of 191(58.6%) of respondents disagree with the statement “All the roots have enough number of buses ready for giving service”.

In the above section that talks about service quality respondents has said that number of passengers that the buses are excess and this leads to the uncomfortable situation it the bus during travel. From this we can see that this determining factor leads us to why service is too low as discussed by passengers.

The Public Transport have enough backup buses that are ready when the demand is high.

There are 52(15.7%) and 9(2.7%) of respondents that respond “agree” and “strongly agree” which makes a total percentage of 18.4%. but when we comes to the other side of the Likert scale there

are a total of 188 respondents which makes 56.8% of the total respondents that disagree with the statement above. The highest number of respondents didn't agree by the statement that says "The Public Transport have enough backup buses that are ready when the demand is high".

Bothe the PT service giving organizations didn't have backup buses that are standby to give service if there is a demand. This goes with capacity issue as they don't have even enough number of buses available on each root for operation.

Each bus has enough number of seats.

The statement "each bus has enough number of seats" is raised and 85(25.7%) and 97(29.3%) respondents answer "strongly disagree" and "disagree". This group makes a total of 182(55%) of respondents which is the highest percentage. When it comes to the availability of enough number of seats the highest number of respondents disagree.

When we see on the number of buses on each root and comfort while traveling the same answer was given which is disagree. This parameters have interconnections and one depends on the other one. Some buses have more standing spaces than their seating capacity.

Economic factor (household income and employment rate):

Economic factor is one of the factor that is identified through this study. As shown in the table below (table 4.7) this factor has three items to be discussed. Economic status of passengers is one of the determining factor for the public transport effectiveness in Addis Ababa city.

Table 4.7: Descriptive statistics for Economic factor (household income and employment rate):

Economic factor (household income and employment rate) are determining factor for	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

public transport effectiveness.										
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
The users of this service are low income community.	**17**	**5.1**	**29**	**8.8**	**53**	**16.0**	**141**	**42.6**	**91**	**27.5**
Public transport is getting customers because the society is at a state of low income.	**11**	**3.3**	**30**	**9.1**	**40**	**12.1**	**160**	**48.3**	**90**	**27.2**
People use public transport service because of the high cost in other modes.	**8**	**2.4**	**19**	**5.7**	**46**	**13.9**	**162**	**48.9**	**96**	**29.0**

The users of this service are low income community.

Under this statement there are 17(5.1%) of respondents reply “strongly disagree” and 29(8.8%) reply for “disagree” this makes s total of 46(13.9%). On the other side of the Likert scale there are 141(42.6%) and 91(27.5%) of respondents who responds “agree” and “strongly agree” respectively and this makes a total of 232(70.1%).

By looking at the above numbers from the table the statement “The users of this service are low income community” is agreed by the highest number of respondents. As the cost of travel for the PT users is low and the economic status of Addis Ababa residents is low.

Public transport is getting customers because the society is at a state of low income.

This statement is raised to know the reason why the PT has large number of passengers. Then out of the 331 respondents 11(3.3%) answer “strongly disagree”, 30(9.1%) of the respondents go with disagree which makes a total of 41(12.4%). On the other side 160(48.3%) and 90(27.2%) respond “agree” and “strongly agree” respectively.

This shows a total of 250(75.5%) agree with a statement “Public transport is getting customers because the society is at a state of low income”. We can see that there is a lot of dissatisfaction in the service quality, travel time, reliability and responsiveness areas and still PT service is favorable. The reaction by respondents for this statement gives an answer for why.

People use public transport service because of the high cost in other modes.

This factor “People use public transport service because of the high cost in other modes” gets a response rate of 162(48.9%) responds “agree” and 96(29.0%) says “strongly agree” with the statement. The aggregate number of 258(77.9%) respondents has agreed with the statement.

This survey question talks also about other modes of public transport givers. This agreement number says that other modes of transportation available to give service in Addis Ababa are more expensive as compared with the Sheger and Anbasa Buses.

Descriptive Statistics on dependent variables:

The dependent variables are assigned by service quality dimension. This dimensions are five in number and they are identified as dependent variables on the determining factors for the public transport effectiveness. The service quality dimensions are discussed with their items.

Public transport in Addis Ababa is **Reliable:**

Reliability is one of the service quality dimension identified by scholars. This dimension has five items that help the researcher to know about reliability. As shown in table 4.8 below the respondents answers are viewed and analyzed. Reliability is an essential dimension of the Servqual model that confirms the capacity to provide services exactly, on time, and credibly. Consistency is a critical factor for providing service to the customers on time with error-free conditions. This statement are set by considering the original Servqual question and changing them to transport logistics.

Table 4.8: Descriptive statistics for reliability:

Public transport in Addis Ababa is reliable.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Public transport in Addis Ababa city gives reliable service by availing buses when I desired.	**50**	**15.1**	**86**	**26.0**	**99**	**29.9**	**79**	**23.9**	**17**	**5.1**
Public transport in Addis Ababa city is reliable by providing timely response through its employees when users encounter any problem.	**48**	**14.5**	**106**	**32.0**	**97**	**29.3**	**65**	**19.6**	**15**	**4.5**

Public transport in Addis Ababa city is reliable to depend myself on the services.	**42**	**12.7**	**94**	**8.4**	**114**	**34.4**	**68**	**20.5**	**13**	**3.9**
Service giving buses are reliable on reaching bus stops at specified time.	**50**	**15.1**	**117**	**35.3**	**95**	**28.7**	**53**	**16.0**	**16**	**4.8**
Public transport in Addis Ababa city is reliable in giving complete facility at bus stop	**49**	**14.8**	**110**	**33.2**	**85**	**25.7**	**66**	**19.9**	**21**	**6.3**

Public transport in Addis Ababa city gives reliable service by availing buses when I desired:

This is the first statement out of the five that is set to identify the reliability of PT in Addis Ababa city. For this item there are 50(15.1%) respondents which says “strongly disagree” and 86(26%) says “disagree” which makes 136(41.1%) of the total 331 respondents. The rest 79(23.9%) and 17(5.1%) says “agree” and “strongly agree” respectively. Those who show agreement with the statement makes 96(29%) of the total respondents.

The above mentioned results that are collected from respondent talks that respondents are disagree with the statement “Public transport in Addis Ababa city gives reliable service by availing buses when I desired”. That means the service giving companies have fixed amount of buses for each root and that number is the only number of buses that are available for a specific root each time.

But its expected to avail large number of buses for the root when there is a demand from passenger side. This kind of managements increase satisfaction on customer side but number of buses available in the city are constraints for doing this.

Public transport in Addis Ababa city is reliable by providing timely response through its employees when users encounter any problem:

Public transport in Addis Ababa is expected to give quick response regarding the service they get from the organization through its employees whenever requested by passengers. The issue was one of the question raised to know passengers response on the case. For this questions 48(14.5%) respondents respond "strongly disagree" and 106(32.0%) says "disagree" this makes a total of 154(46.5%) of the total respondents. Then, there are 65(19.6%) and 15(4.5%) of respondents that are 80(24.1%) respond "Agree" and "strongly agree" respectively.

This tells for the reader that the largest rate which is 154(46.5%) of respondents disagree with the statement. This is one indicator that the reliability of the public transport in Addis Ababa city. Raising professionalism and equipping with knowledge is a key.

Public transport in Addis Ababa city is reliable to depend myself on the services:

Is the public transport a good option of transport mode to rely oneself on? This question has a relation with service quality in the previous section. The service quality factor gets a negative response as we see it previously. There are 42(12.7%) and 94(28.4%) respondents which responds "strongly disagree" and "disagree" that makes total of 136(41.1%) which is followed by 114(34.4%) of "neutral" response.

The response has a message that says this statement of "Public transport in Addis Ababa city is reliable to depend myself on the services" that talks about relying on the public transport reliability

disagreed with passengers opinion. On service reliability is a core issue to fulfill. If the service giver failed to give reliable service for customers that shows that the futurity of the service to be negative. Its expected from public transport service givers to make themselves reliable.

Service giving buses are reliable on reaching bus stops at specified time:

This question for respondents have a relation with travel time that is identified as an independent variable. For this item there are 50(15.1%) respondents with an answer "strongly disagree" and 117(35.3%) respondents said "disagree" which makes highest of 167(50.4%) respondents out of the 331 total respondents. There are 95(28.7%) respondents with "neutral" stand and a total of 69(20.8%) shows there agreement.

Buses get late because of many reasons that brings dissatisfaction to users. Buses don't have specific arrival time at their stations according to an answer given to the statement "Service giving buses are reliable on reaching bus stops at specified time". This results shows that how unreliable the service is in the eye of respondents.

Public transport in Addis Ababa city is reliable in giving complete facility at bus stop:

Services at bus stations can be ticket sells, refund for unused ticket, complain solving, shades …etc. this are some of the services that are expected by passengers at stations. For this question respondents come up with 49(14.8%) of respondents says "strongly disagree" and 110(33.2%) "Disagree". The total number of disagreement is 159(48%) of respondents. This is the highest response than those respondents that gives an answer for agreement side of the Likert scale.

For the statement "Public transport in Addis Ababa city is reliable in giving complete facility at bus stop" the respondents say lean to disagree". Getting complete service at spot saves customers time and brings customer satisfaction on the service.

Public transport in Addis Ababa has **Assurance** on its service deliveries:

Assurance is the one of the Servqual dimension. Assurance means creating trust and credibility for the customers. It depends on the employee's technical knowledge, practical communication skills, courtesy, credibility, competency, and professionalism. Therefore, these skills will help the organization gain customer trust and credibility. The assurance dimension combines four factors: competence, courtesy, credibility, and security. Firstly, competence means having the requisite skills and knowledge Courtesy refers to the politeness, respect, consideration, and friendliness of contact staff. Credibility is the trustworthiness, believability, and honesty of the staff. Finally, security means freedom from danger, risk, or doubt.

The table 4.9 below shows the results from the respondents. This dimension have four items under it and all are converted questions from to transport version.

Table 4.9: Descriptive statistics for assurance:

Public transport in Addis Ababa has assurance on its service deliveries.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Attendants are concerned about security when the user luggage in the bus	**52**	**15.7**	**120**	**36.3**	**88**	**26.6**	**65**	**19.6**	**6**	**1.8**

Comfort in the bus during the trip is secured	**70**	**21.1**	**127**	**38.4**	**77**	**23.3**	**48**	**14.5**	**9**	**2.7**
I feel safe (in terms on drivers driving ability) while using public transport buses.	**43**	**13.0**	**85**	**25.7**	**77**	**23.3**	**100**	**30.2**	**26**	**7.9**
Staffs have enough knowledge on their work	**24**	**7.3**	**72**	**21.8**	**127**	**38.4**	**91**	**27.5**	**17**	**5.1**

Attendants are concerned about security when the user luggage in the bus

One of the concern that assurance wants to raise about security. Security have to be guaranteed by the service givers of the public transport for the passengers to be safe. There are 52(15.7%) respondents which says “strongly disagree” and there are 120(36.3%) respondents which respond “disagree” this makes a total of 172(52%) of respondents. The respondents with the disagreement side are higher as compared with the total agreement rate or neutral of 71(21.4%) and 88(26.6%) respectively.

The numbers has a lot to talk about the bus attendants concern for the security of passenger’s properties. The response for the statement “Attendants are concerned about security when the user luggage in the bus” is disagreement. This implies that attendants lack a concern r knowledge what they are expected to do for the properties of their customers.

Comfort in the bus during the trip is secured:

As it’s tried to be observe in the above table 4.9 the assurance of customers are analyzed through comfort. The question of how we sense the issue of comfort in our trip is replied as 70(21.1%) of respondents agree with the scale of “strongly disagree” and 127(38.4%) of the respondents said

"disagree". this percentage is the highest total 197(59.5%) as compared with "neutral" 77(23.3%) and 57(17.2%) agreement rate respectively.

This said it all about the assurance of passengers to get comforted or not on there trip. 59.5% of respondents sow there disagreement for the statement "Comfort in the bus during the trip is secured". This comfort issue goes with the large number of passengers in the bus, because as the number increase the chance to get a seat and comforted will not be secured.

I feel safe (in terms on drivers driving ability) while using public transport buses:

This item is one of the most controversial to conclude as we see from the numbers. There are 128(38.7%) of respondents that disagree and 126 (38.1%) that agree. The statement says "I feel safe (in terms on drivers driving ability) while using public transport buses".

Then, assurance can't be given for passengers about driving ability of drivers. This can be seen from passenger's fear or knowledge about driving of driver's ability or qualification.

Staffs have enough knowledge on their work

This item is the last one to evaluate the assurance of public transport service in Addis Ababa city. There are a total of 96(29.1%) of respondents which shows there disagreement and 108(32.6%) of respondents that agree with the statement. And there are "neutral" respondents with the highest number of 127(38.4%).

The statement is "Staffs have enough knowledge on their work". This statement is there to measure the knowledge of attendants there attitude towards their work on customer service. The assurance dimension is about competence, courtesy, credibility, and security. And the staff's knowledge about their work can answer questions listed here.

Public transport in Addis Ababa is **Tangible** in its service.

This Servqual dimension have four items that can explain Tangibility of the public transport in Addis Ababa city. Tangible represent the physical facilities, employees' appearance, equipment, machines, and information system. It focuses on facilitating materials and physical facilities. For example, the organization maintains a clean environment, and staff follows the appropriate dress code. The items for this dimension are listed and analyzed as shown in table 4.10 below.

Table 4.10: Descriptive statistics for Tangible:

Public transport in Addis Ababa is tangible in its service.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Public transport service have specified stops.	**19**	**5.7**	**38**	**11.5**	**60**	**18.1**	**162**	**48.9**	**52**	**15.7**
Public transport Staff's professional appearance is satisfactory.	**21**	**6.3**	**93**	**28.1**	**116**	**35.0**	**84**	**25.4**	**17**	**5.1**
Public transport in Addis Ababa have enough buses to give satisfactory service.	**58**	**17.5**	**130**	**39.3**	**81**	**24.5**	**50**	**15.1**	**12**	**3.6**
Public transport service has covered all Areas in Addis Ababa.	**44**	**13.3**	**93**	**28.1**	**95**	**28.7**	**74**	**22.4**	**25**	**7.6**

Public transport service have specified stops:

For this item there are 19(5.7%) individuals that responds “strongly disagree” and 38(11.5%) respondents responds “disagree” and it makes an aggregate of 57(16.2%). On another side of the Likert scale there are 162(48.9%) respondents that says “agree” and 52(15.7%) says strongly agree. When we see at the numbers the total number of 214(64.6%) of respondents shows there agreement with the statement “Public transport service have specified stops”.

This says that buses with a specific number labeled on them or their root written on them have specific root or stops. This scenario helps passengers to easily know where to go and which station to stop by.

Public transport Staff’s professional appearance is satisfactory:

This item is here to prove how tangible the public transport in Addis Ababa is. As we said earlier tangible represent the physical facilities and employees’ appearance. This is unique uniform that can increase their professional appearance that makes them presentable and easily identified from anyone around them. This increases customer satisfaction, employee confidence and professionalism. For this item 21(6.3%) responds “strongly disagree” and 93(28.1%) “disagree” which makes total number of 114(34.4%). The highest number of respondents 116(35.0%) respond “neutral”.

When we see this and the lowest number of agreement with the statement “Public transport Staff’s professional appearance is satisfactory” we have to realize that the low level of professional appearance by public transport service givers.

Public transport in Addis Ababa have enough buses to give satisfactory service:

This item is an indicator for most of the item results that are indicated in another parts. Because the public transport service is given by using buses mainly. This numbers can be seen from the table at the annex part of this paper. How many buses did Sheger mass transport service enterprise and Anbasa city bus have is listed at the end. The number buses that both have functional is 924. For this item out of the total 331 respondents total of 188(56.8%) of respondents shows their disagreement, 81(24.5%) are "neutral" with the statement and 62(18.7%) shows their agreement.

This statement of "Public transport in Addis Ababa have enough buses to give satisfactory service" is the determining item. This number needs to increase in order to bring customer satisfaction, increase productivity of the users, increase revenue and bring city development. For the resident above five million it's not enough to have only this number of buses.

Public transport service has covered all Areas in Addis Ababa:

Addis Ababa is a large city with an area that needs to be covered by public transport service givers. The largest number of respondents disagreed with the statement "Public transport service has covered all Areas in Addis Ababa". Out of the total 44(13.3%) responds "Strongly disagree" and 93(28.1%) respond "disagree" with total disagreement rate of 137 which makes a percentage of 41.4%.

This shows how an improvement is needed in increasing number of buses and trying to cover all the roots of the city in order to address the service to all.

Public transport in Addis Ababa has an **Empathy** on its services:

This is the fourth dimension of Servqual dimension. This dimension has five standard questions that are designed by scholars and I changed them to transport version for this study purpose. Empathy means

focusing on the customers attentively to ensure caring and distinguishing service. Additionally, empathy is a combination of the following factors. Access, Communication and Understanding the customer. Under this dimension there are five identifying items to discuss. Table 4.11 below shows the results from respondents.

Table 4.11: Descriptive statistics for Empathy:

Public transport in Addis Ababa has an empathy on its services.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Drivers and attendants clearly communicate with customers in understandable way.	**58**	**17.5**	**90**	**27.2**	**94**	**28.4**	**78**	**23.6**	**11**	**3.3**
Bus attendants are caring for individual problems to give appropriate response.	**46**	**13.9**	**105**	**31.7**	**112**	**33.8**	**61**	**18.4**	**7**	**2.1**
Public transport buses provide special service for customers with special need.	**59**	**17.8**	**129**	**39.0**	**70**	**21.1**	**60**	**18.1**	**13**	**3.9**
The firm has service 24 hours and 7 days a week.	**105**	**31.7**	**99**	**29.9**	**71**	**21.5**	**41**	**12.4**	**15**	**4.5**

Hygiene of bus is attractive for users.	**86**	**26.0**	**100**	**30.2**	**91**	**27.5**	**41**	**12.4**	**13**	**3.9**

Drivers and attendants clearly communicate with customers in understandable way:

The main service giver on the public transport are drivers and attendants. Passengers face this two units of workers first time when they use buses. For this item there are 58(17.5%) of respondents which choose "strongly disagree" and 90(27.2%) says "disagree" this makes a total of 148(44.7%).

The response for this statement "Drivers and attendants clearly communicate with customers in understandable way" is disagree. The response for drivers and attendants knowledge was also disagreement. This two shows that there is lack of customer service knowledge by attendants and drivers.

Bus attendants and drivers are caring for individual problems to give appropriate response:

This tem here is one of the items that are here to evaluate the empathy of the PT service in Addis Ababa city. One of the characteristics of empathy to have clear communication and understanding of customers. 46(13.9%) and 105(31.7%) of respondents respond "strongly disagree" and "disagree" respectively which is the highest of other responses with 151(45.6%) respondents.

Respondents are disagree with this statement that says "Bus attendants are caring for individual problems to give appropriate response". This shows lack of customer service quality by attendants and drivers.

Public transport buses provide special service for customers with special need:

Identifying the public transport effectiveness is the main issue that this paper focuses on and to do this examining service quality dimensions gives as an answer. For an item that is mentioned under empathy there are 59(17.8%) which responds “strongly disagree” and 129(39.0%) responds “disagree”.

Total response gives a total of 188(56.8%) disagreement with the statement “Public transport buses provide special service for customers with special need”. Special need passengers need special case and buses needs to be designed with a specification to meet customer needs.

The firm has service 24 hours and 7 days a week:

Practically the firm didn’t give 24 hour service but they are giving 7 days a week. 105(31.7%) and 99(29.9%) of respondents has respond “strongly disagree” and “disagree” respectively. This makes a total 204(61.6%) out of 331 respondents.

Economic factors can be raised, city resident’s demand can be considered why the service didn’t last 24 hours a day. But the statistics shows that highest number of respondents disagree with the statement “The firm has service 24 hours and 7 days a week”. It’s also expected to see if there is a need.

Hygiene of bus is attractive for users:

One of the customer satisfaction increasing factor can be the hygiene of the buses. 186 respondents which makes 56.2% of respondents has disagreed with “Hygiene of bus is attractive for users”. Buses have both external and internal hygiene problems.

Public transport in Addis Ababa is **Responsive** in its service:

Responsiveness refers to the eagerness to assist customers with respect and provide quick service to satisfy. This dimension focuses on the two essential factors, including willingness and promptness. Responsiveness will be defined by the length of time when customers wait for the answer or solution. In short, responsiveness solves the customer problem as soon as possible by providing expected information or replacing products. This dimension is the fifth and it has four items under listed. Table 4.11 has all the results from respondents as stated below.

Table 4.12: Descriptive statistics for Responsiveness:

Public transport in Addis Ababa is responsive in its service.	**Strongly Disagree**		**Disagree**		**Neutral**		**Agree**		**Strongly Agree**	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Bus attendant quickly respond to complaints	**71**	**21.5**	**141**	**42.6**	**68**	**20.5**	**43**	**13.0**	**8**	**2.4**
Bus attendant willing to follow up on complaints from users	**60**	**18.1**	**141**	**42.6**	**82**	**24.8**	**42**	**12.7**	**6**	**1.8**
Bus attendant willing to listen to complaints from users	**67**	**20.2**	**133**	**40.2**	**75**	**22.7**	**48**	**14.5**	**8**	**2.4**
Bus users can submit a complaint easily.	**68**	**20.5**	**146**	**44.1**	**54**	**16.3**	**50**	**15.1**	**13**	**3.9**

Bus attendant quickly respond to complaints:

Complaint can be raised at any time in the day on trip. Under this item 71(21.5%) respondents says “strongly disagree”, 141(42.4%) “Disagree”, 68(20.5%) “Neutral”, 43(13.0%) “Agree” and 8(2.4%) “Strongly agree”.

The highest number of respondents disagree with the statement “Bus attendant quickly respond to complaints” with total number of 212(63.9%). With this result it shows responsiveness is low as per this question.

Bus attendant willing to follow up on complaints from users:

For the complaints raised by passengers during their trip but the responses are expected as fast as possible. There are 60(18.1%) and 141(42.6%) of respondent respond that “Strongly disagree” and “disagree” respectively.

There are a total of 201 respondents which makes 60.7% of the total respondents that disagrees with the statement “Bus attendant willing to follow up on complaints from users”. This item goes with the knowledge of attendants and their state of service quality.

Bus attendant willing to listen to complaints from users:

For this item under responsiveness of public transport 67(20.2%) respondents go with “strongly disagree” and 133(40.2%) of them says “disagree”. so, this shows that attendants and drivers are not responsive for customers complains.

Bus users can submit a complaint easily:

The under study Public Transport givers as Service giving organization are expected to meet need of their passengers. To meet this need a feedback collecting mechanism is expected from them to address their customers. For the above stated item there are 68(20.5%) respondents that says “strongly disagree” and 146(44.1%) of respondents which says “disagree”.

“Bus users can submit a complaint easily” is evaluated as disagree. this shows the improvement expected from the service givers.

Correlation Analysis

The association between PT effectiveness determining factors (independent variables) and service quality dimensions (dependent variables) was shown and addressed in the next section. The section covered the direction and magnitude of the relationship between the dependent and independent variables as well as their components.

A perfect positive relationship is defined by a correlation coefficient of +/-1, in which every change of +/-1 in one variable is linked with a change of +/-1 in the other variable. A correlation of 0 indicates that no correlation. As a result, Pearson's Product Moment Correlation is used. The link between the variables under research is examined using coefficients and linear regression, and the strength of the correlation was evaluated using Evans' (1996) recommendation in the following pattern:-

0.00 - 0.19 “Very weak”

0.20 - 0.39 “Weak”

0.40 - 0.59 “Moderate”

0.60 - 0.79 “Strong”

0.80 - 1.00 “Very strong”

The relationship between dependent and independent variables

Table 4.13. The correlation between independent and dependent variables.

Correlations			
		Independent variable	dependent variable
Independent variable	Pearson Correlation	1	.629**
	Sig. (2-tailed)		.000
	N	331	331
Dependent variable	Pearson Correlation	.629**	1
	Sig. (2-tailed)	.000	
	N	331	331
**. Correlation is significant at the 0.01 level (2-tailed).			

As we can see from the above table the significance between the determinants of public transport effectiveness (independent variable) and the service quality dimensions (dependent variables) is significant at 0.01 level. This Pearson correlation shows that the dependent and independent variables have positive relationships. The Pearson says that if the correlation is between 0 and 1 it shows that the two variables have positive relationship. This means when one increases the other also increase at the same time. Pearson correlation is 0.629 and it shows that independent and dependent variables have positive relationship.

Relationship Between components of public transport effectiveness determinants and service quality dimensions

The researcher also ran a Pearson correlation analysis to see the relationship of individual between the determinants of public transport effectiveness (independent variable) and the service quality dimensions (dependent variables).

According to the below table, the correlation coefficient is very strong and represents a statistically significant positive relationship between independent variable items and dependent variable items.

Table 4.14: The correlation between components of Public Transport effectiveness determinants and Service Quality Dimensions.

Correlations												
		Travel Cost	Travel Time	Service Quality	Alternative Mode	Number of Buses	Economic Factor	Reliability	Assurance	Tangibility	Empathy	Responsiveness
Travel Cost	Pearson Correlation	1	.272**	.217**	.432**	.278**	.284**	.265**	.213**	.248**	.140*	.103
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.011	.061
	N	331	331	331	331	331	331	331	331	331	331	331
Travel Time	Pearson Correlation	.272**	1	.468**	.485**	.494**	.063	.491**	.332**	.363**	.377**	.334**
	Sig. (2-tailed)	.000		.000	.000	.000	.255	.000	.000	.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Service Quality	Pearson Correlation	.217**	.468**	1	.324**	.534**	.068	.472**	.385**	.382**	.529**	.365**
	Sig. (2-tailed)	.000	.000		.000	.000	.216	.000	.000	.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Alternative Mode	Pearson Correlation	.432**	.485**	.324**	1	.428**	.255**	.414**	.263**	.375**	.249**	.194**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Number of Buses	Pearson Correlation	.278**	.494**	.534**	.428**	1	.126*	.623**	.450**	.533**	.514**	.395**
	Sig. (2-tailed)	.000	.000	.000	.000		.021	.000	.000	.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Economic Factor	Pearson Correlation	.284**	.063	.068	.255**	.126*	1	.199**	.150**	.230**	.079	.043
	Sig. (2-tailed)	.000	.255	.216	.000	.021		.000	.006	.000	.150	.433
	N	331	331	331	331	331	331	331	331	331	331	331
Reliability	Pearson Correlation	.265**	.491**	.472**	.414**	.623**	.199**	1	.554**	.554**	.623**	.495**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Assurance	Pearson Correlation	.213**	.332**	.385**	.263**	.450**	.150**	.554**	1	.484**	.580**	.455**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.006	.000		.000	.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
	Pearson Correlation	.248**	.363**	.382**	.375**	.533**	.230**	.554**	.484**	1	.479**	.396**

Tangibility	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	331	331	331	331	331	331	331	331	331	331	331
Empathy	Pearson Correlation	.140*	.377**	.529**	.249**	.514**	.079	.623**	.580**	.479**	1	.647**
	Sig. (2-tailed)	.011	.000	.000	.000	.000	.150	.000	.000	.000		.000
	N	331	331	331	331	331	331	331	331	331	331	331
Responsiveness	Pearson Correlation	.103	.334**	.365**	.194**	.395**	.043	.495**	.455**	.396**	.647**	1
	Sig. (2-tailed)	.061	.000	.000	.000	.000	.433	.000	.000	.000	.000	
	N	331	331	331	331	331	331	331	331	331	331	331

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Regression Analysis

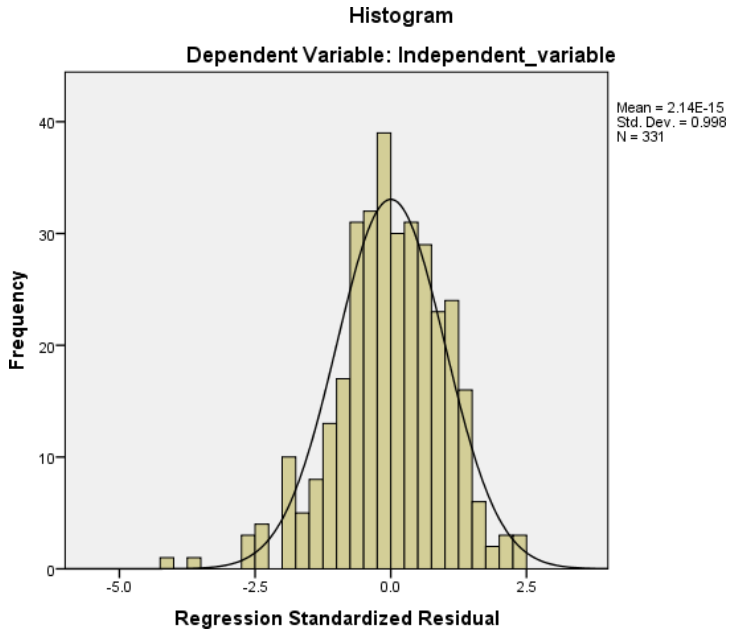
Diagnosis Tests

According to Field (2009), in order to execute a basic linear regression, it is necessary to examine crucial assumptions, which is useful in drawing conclusions about the population under investigation. The normality of both predictor and predicted variables, as well as the linearity of the said relationship, were examined in this respect. Besides, Key assumptions should be satisfied while doing multiple regression analysis utilizing regression equation, as stated by Saunders, et al. (2009).

I. Normality

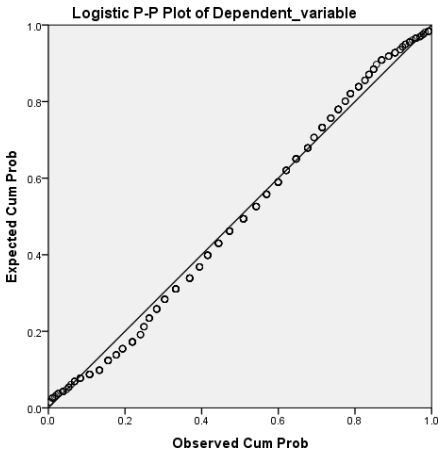
As a result, among the several approaches to verify the normality assumptions for basic linear regression analysis, inspecting a distribution using a histogram and probability–probability plot is recommended. As a result, in order to verify the validity of these assumptions, the researcher uses a histogram and a P-P plot to check for normality.

Figure 4.1: Histograms



As Garson (2012) and Field (2009) pointed out, the form of a symmetric bell-shaped curve as normal distribution. Accordingly, as can be seen in the figure 4.1, the histogram appears to have normal distribution or bell-shaped curve and the distribution is normal. Also, the curve is symmetrical and skewed. As a result, it can conclude that it is a good model for the data.

Figure 4.2: Normal distribution error



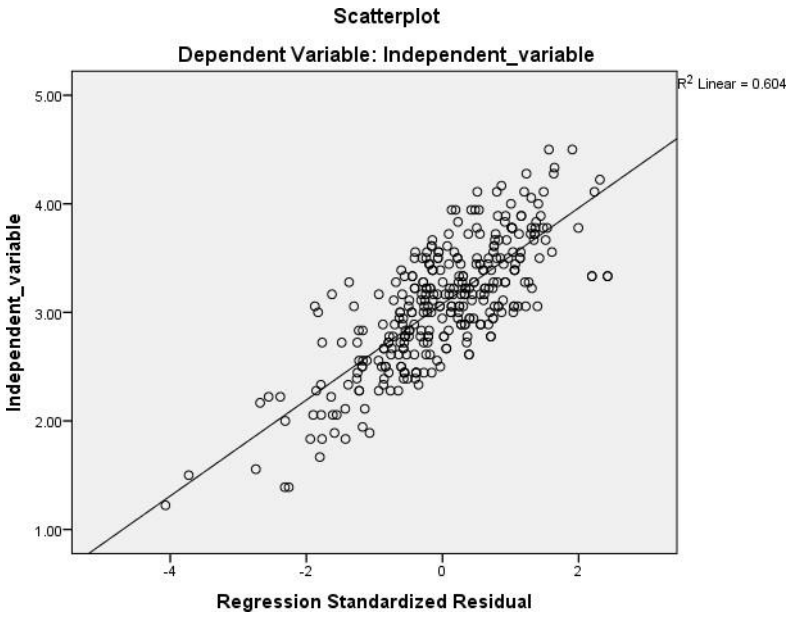
Deviations from normality are also visible in the normal probability plot. The dots in this figure reflect the observed residuals, whereas the straight line indicates a normal distribution. As a result, with a data set with precisely normal distribution, all points will lie on the line (Field, 2009). Similarly, as seen in the preceding figure (figure 4.2), the dots are closely aligned to the straight-line, indicating a minor or no deviation from normality. As a result, the basic linear regression assumption has been fulfilled, and we may reasonably infer that the model is correct and can be generalized to the entire population.

II. Homoscedasticity

Homoscedasticity is used to determine whether the relationship under study is the same across the entire range of the dependent variable, according to Garson (2012), and lack of homoscedasticity is indicated by higher errors (residuals) for some portions of the range, as shown on the scatterplot. If the assumption of homoscedasticity is met, the graphs of *ZRESID and *ZPRED should look like a random arrangement of dots around zero, as shown by Field (2009). Similarly, as seen in figure 4.4 below, the points are dispersed

randomly and equally throughout the plot, with no obvious outliers on this cloud of dots centered on zero. Thus, it can conclude that the random errors and homoscedasticity assumption has been met.

Figure 4.3: Homoscedasticity



Linear regression Analysis

Table 4.15: Model summery, service quality dimensions as predictors of determinant factors.

Model Summary[b]				
Model	R	Adjusted R Square	Adjusted R Square	Std. Error of the Estimate
1	.629[a]	.396	.394	.49825
a. Predictors: (Constant): Determinants of Public Transport Effectiveness				
b. Dependent Variable: Service quality dimensions				

From the above table 4.15, it can be detected that R is 0.629a and R square is .396. This implies that about 39.6% of the variance in service quality dimensions (dependent variable) can be explained by determinant factors for public transport effectiveness (independent variable). Other variables not included in this study account for the remaining 60.4 percent of the variance.

As service giving organization public transport service giving organizations needs to meet their customers satisfaction. As Servqual dimensions have 40% contribution it shows that there are 60% contributing other factors that are not included in this study.

Table 4.16: ANOVA

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	53.448	1	53.448	215.292	0.000[b]
	Residual	81.677	329	0.248		
	Total	135.125	330			
a. Dependent Variable: **Service quality dimensions**						
b. Predictors: (Constant), **Determinants of Public Transport Effectiveness**						

,

The F test result in this above ANOVA table is 215.292, with a significance of less than 0.001, indicating that the odds of these occurrences occurring by random are less than .001. As a result, the determining factors for public transport effectiveness influence a significant portion of service quality, implying that the independent variable (determinants of public transport effectiveness) statistically and significantly predicts the dependent variable (service quality dimensions), and thus the overall regression model is significant and is a good fit of the data, $F(1, 329) = 215.292$, $p < .001$, $R2 = .396$.

Furthermore, the reduced standard error of the estimate and larger F value demonstrated that the dependency between the two variables.

CHAPTER FIVE

5 SUMMERY OF FINDING, CONCLUSION AND RECOMMENDATIONS

The findings of the study on the Determinants of Public Transport Service Effectiveness in Addis Ababa City are summarized in this section. It also includes conclusions and recommendations based on the findings.

Summary of Findings

Six factors including Travel Cost, Travel Time, Service Quality, Availability of alternative mode of transport, Number of Buses, Number of Buses and Economic Factors were found to be crucial for determinants of public transport effectiveness in Addis Ababa city, according to the study.

Table 4.17: Summary of results for determining factors for public transport

Determining factors for public transport	Total mean value	Rank
Travel Cost	3.5458	2
Travel Time	2.7895	4
Service Quality	2.6133	5
Availability of alternative mode of transport	3.2004	3
Number of Buses	2.4441	6
Economic Factors	3.8731	1

The findings in the study revealed that factors that are identified as determining factors in literatures are close to agree in assuring service quality in public transport. The results in this study shows that public transport effectiveness has faced listed problems that we can observe chapter four of this paper. As we can see from the table 4.15 above Economic factor with (mean = 3.87) it has a largest mean value which gets

closer to agreement. As from the items listed under this factor in the Likert scale respondents has agreed with the statements that talks about the users. It shows that the Public Transport (PT) users are mostly low income groups of the society and the driving force to use PT is the high transportation coast in other modes of transportation.

The second ranked factor is travel coast with a (mean = 3.54). Under this factor people has shown that there a fair price on PT service givers that can match the economic standard of customers. In third place availability of other modes of transportation is placed. The mean value for this factor is (mean = 3.20). Under this determining factor respondents agree that affordability, availability and accessibility of PT's is better as compared with other modes of transportation.

Fourth place is taken by travel time with a (mean = 2.78). Travel time is ranked fourth by showing an agreement with the time usage and by buses as a positive. Then, service quality is ranked fourth with a mean of 2.61. This factor is rated by examining buses hygiene, assistant and driver cooperation and number of passengers per buses. Respondents showed positive agreement towards the Likert scale. Final and sixth place determining factor is the number of buses (mean = 2.44). For questions enough number of buses on each root, back up buses at emergency and number of seats in the bus respondents go with negative agreement as we can observe from the results.

The study also conducted correlation analysis to learn the relationship between the independent variables (Travel Cost, Travel Time, Service Quality, Availability of alternative mode of transport, Number of Buses and Economic Factors) and dependent variables which are service quality dimensions (Reliability, Assurance, Tangibility, Empathy and Responsiveness). Its results revealed that all the independent variables have a positive, strong and significant correlation with dependent variables. In addition, the independent variable which is number of buses have strong relationship with service quality at 0.534 and with empathy at 0.647.

Also, the study undertakes linear regression analysis to uncover the influence of each components of service quality dimensions on determinant factors of public transport. The linear regression model suggests that 39.6% of the variance in service quality is due to the variance in determining factors. Furthermore, a positive relationship exists between each items. Even if there are other driving factors the result shows what this items to mean.

Conclusion

The main aim of this study is to identify the determinant factors for public transport effectiveness and to see the service quality of public transport service givers through the twenty two service quality items.

According to the study's finding, all the factors that are identified as the determinants for an effectiveness of public transport and the service quality dimensions are found to be significant in their contribution. From the finding, it can be seen that the variables that are identified contributes 39.6% of for the effectiveness. From this result, it can be concluded that there is a strong relationship the determinant factors their contribution for effectiveness. Then, working on this parameters identified will help the public transport service givers to excel their services.

All the identified factors have their contribution to increase service quality and effectiveness of the service area. Also all the service quality dimensions and their 22 items helps evaluate the service quality and gives a knowledge on the status. Both the dependent and independent variables and their items shows where the service is, which one is more determinant and a service needs improvement.

Recommendation

As the findings of the study point out, the independent variables which are determining factors for the public transport effectiveness are identified as the factors for effectiveness. This are Travel Cost, Travel Time, Service Quality, Availability of alternative mode of transport, Number of Buses and Economic Factors all are determining factors for the effectiveness of PT. Also the service quality dimensions which are

Reliability, Assurance, Tangibility, Empathy and Responsiveness shows the effectiveness state and magnitude of PT in Addis Ababa.

It is recommended that establishing a system to evaluate the service quality standing from the results is helpful for the organizations to improve. Allowing training and coaching platform should be arranged, so that inexperienced drivers and attendants will gain knowledge on how to give service, complain management, service excellence and other issues. Training on driving skills, communication skill, complain management in general can make a vital contribution towards improving on public transport service enhancement.

Also the government is responsible on improving travel time by taking measures like allowing bus lane only, involving mass transport private company in the market, improving travel coast for low income community, increasing number of buses and covering all the roots in the city. Doing this helps in capacity building, customer satisfaction and increasing revenue.

Suggested Further Research

The aim of this research is to identify public transport determinants and evaluating the effectiveness through service quality dimensions. This research is not enough in the area. Then it's suggested that to conduct research on transport coast evaluation, drivers and attendant's knowledge on the service, infrastructures for transportation and traffic managements. Also government policies should be revised. Policy change amendment on the public transport sector and transportation in general will help the improvement on the area.

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Annex II: Questioners

School of Commerce Master of Arts Degree in Logistics and Supply Chain Management, questioner to asses Determinants of Public Transport Service Effectiveness in Addis Ababa City

Dear respondent,

This questionnaire is prepared as a data collection tool for a research titled "Determinants of Public Transport Service Effectiveness in Addis Ababa City". As indicated in the title, the research aims at identifying the determining factors for the public transport effectiveness in Addis Ababa and to list the factors according to their severity degree.

The information you provide is confidential and is used only for the purpose of this study. As a user of Public Transport in Addis Ababa (**Anbasa Bus, Sheger Bus or Both**) you are invited to rate factors listed below based on your experience as an end user. The questionnaire will have two main parts. Section one asks few personal information; Section two lists the determinant factors and the measuring parameters for determinants.

I assure you that your response will be confidential.

Thank you so much for being part of this research and I am hopeful your responses will be of very much value to the research being conducted. For any inquiries, please contact the researcher at his phone number **0910102482** or personal email address sentset143@gmail.com.

- Put " √ " mark in the box that you think will best represent your feeling.
- You don't need to put your name or another writing on the paper.

Sintayehu Likisa

Section 1: Demographic profile of the respondents.

A. Gender ☐ Male ☐ Female

☐

B. Age Group: ☐ Bellow 18 ☐ 18 to 35 ☐ 36 to 50 Above 50

C. Educational Status

☐ Bellow Diploma, ☐ Diploma ☐ First Degree ☐ M.Sc. and Above

Section 2: How do you rate the following possible determinants for the public transport effectiveness? Make ✓ sign under the item you rate the factor to belong to:

Where: 1 stands for Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree & 5 = Strongly Agree

Determinant factors for the public transport effectiveness.						
1	**Cost of travel** is determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
1.1	Ticket price for the service match with the service that you get.					
1.2	Ticket price is affordable for all of the community.					
1.3	Government subsidies on the service is satisfactory.					
2.	**Travel Time** is determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
2.1	Buses have specific arrival time at each bus stop.					
2.2	The time that you spend to travel from point A to B is acceptable.					
2.3	Buses spend fair time on loading and unloading passengers at there stops.					
3	**Service quality** is determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
3.1	Cashiers and Drivers are cooperative to serve.					
3.2	Buses are clean and attractive.					
3.3	Number of passengers that the buses hold gives comfort during travel.					
4	**Availability and cost of alternative travel modes** is determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
4.1	Public transport is affordable as compared to other modes.					
4.2	It's easy to access public transport when it's compared to other modes (trolley, meter Taxis and mid bus taxis).					
4.3	Proximity of bus stops.					
5	**Number of Buses on the root** are determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
5.1	All the roots have enough number of buses ready for giving service.					
5.2	The Public Transport have enough backup buses that are ready when the demand is high.					
5.3	Each bus has enough number of seats.					
6	**Economic factor (household income and employment rate)** are determining factor for public transport effectiveness.	**1**	**2**	**3**	**4**	**5**
6.1	The users of this service are low income community.					
6.2	Public transport is getting customers because the society is at a state of low income.					

6.3	People use public transport service because of the high cost in other modes.					
Public transport effectiveness						
1	**Public transport in Addis Ababa is reliable.**	**1**	**2**	**3**	**4**	**5**
1.1	Public transport in Addis Ababa city gives reliable service by availing buses when I desired.					
1.2	Public transport in Addis Ababa city is reliable by providing timely response through its employees when users encounter any problem.					
1.3	Public transport in Addis Ababa city is reliable to depend myself on the services.					
1.4	Service giving buses are reliable on reaching bus stops at specified time.					
1.5	Public transport in Addis Ababa city is reliable in giving complete facility at bus stop					
2.	**Public transport in Addis Ababa has assurance on its service deliveries.**	**1**	**2**	**3**	**4**	**5**
2.1	Attendants are concerned about security when the user luggage in the bus					
2.2	Comfort in the bus during the trip is secured					
2.3	I feel safe (in terms on drivers driving ability) while using public transport buses.					
2.4	Staffs have enough knowledge on their work					
3	**Public transport in Addis Ababa is tangible in its service.**	**1**	**2**	**3**	**4**	**5**
3.1	Public transport service have specified stops.					
3.2	Public transport Staff's professional appearance is satisfactory.					
3.3	Public transport in Addis Ababa have enough buses to give satisfactory service.					
3.4	Public transport service has covered all Areas in Addis Ababa.					
4	**Public transport in Addis Ababa has an empathy on its services.**	**1**	**2**	**3**	**4**	**5**
4.1	Drivers and attendants clearly communicate with customers in understandable way.					
4.2	Bus attendants are caring for individual problems to give appropriate response.					
4.3	Public transport buses provide special service for customers with special need.					
4.4	The firm has service 24 hours and 7 days a week.					
4.5	Hygiene of bus is attractive for users.					
5	**Public transport in Addis Ababa is responsive in its service.**	**1**	**2**	**3**	**4**	**5**
5.1	Bus attendant quickly respond to complaints					
5.2	Bus attendant willing to follow up on complaints from users					
5.3	Bus attendant willing to listen to complaints from users					
5.4	Bus users can submit a complaint easily.					

Annex III: Travel root and root distance (Sheger Bus)

የመስመር መረጃ ርቀት በኪ.ሜ.....2014 ዓ.ም		
ተ.ቁ	**መስመር**	**የመስመሩ ርቀት በኪ.ሜ**
1	የካአባዶ ----መገናኛ	12
2	መገናኛ ----አራብሳ	15.5
3	መገናኛ ----ሳሚት	11.5
4	መገናኛ ----ጣፎ	13
5	የካ አባዶ---- ፒያሳ	18.5
6	መገናኛ ----አያት	9
7	የካ አባዶ---- ሜክሲኮ	19
8	አራብሳ ----ሜክሲኮ	25
9	አራብሳ ----ፒያሳ	23.1
10	ከመገናኛ አያት አዳባባይ----- 44 ማዞሪያ	24
11	ከመገናኛ ---- 49	12
12	ከመገናኛ --- ሚሽን	13
13	መገናኛ ----ገላን	21.5
14	መገናኛ ----ከተቤ	7
15	ከመገናኛ --- ካራ	8.5
16	መገናኛ ----ጎሮ ሰፈራ	7
17	መገናኛ ----ሰሚት	11.5
18	ሰሚት ----ቦሌ	14
19	መገናኛ ----ሜክሲኮ	7
1	ሜክሲኮ ----ጀሞ 1	9
2	ሜክሲኮ ----ጀሞ 2	13
3	መብራትሀይል --- ፒያሳ	14
4	መገናኛ ----ሳሪስ	11.7
5	ሜክሲኮ ----ላፍቶ	13
6	ጀሞ1 ----ፒያሳ	12
7	ጀሞ2 ----ፒያሳ	16
8	ከሸሮሜዳ ----ሳሪስ	14
9	ሜክሲኮ ----ጀሞ 3	11
10	ሳሪሰ ----ፒያሳ	12
11	ሃና ማርያም---- ሜክሲኮ	10
12	ሃይለጋርመንት ----ሜክሲኮ	9
13	ሃይለጋርመንት ----መገናኛ	17
14	ሃና ማርያም---- አየር ጤና	8

15	ቃልቲ ቶታል ----ስተዲየም	16
16	ቃልቲ ቶታል ----መገናኛ	17
17	ቂሊንጦ---- ቃልቲ ቶታል	6.1
18	ቂሊንጦ---- ሜክሲኮ	22.5
19	ቱሊዱምቱ ----ቃሊቲ ቶታል	8
20	ከየሺ ቶታል---- በቃልቲ ቶታል	5
21	ቃልቲ ቶታል ----ሳሪስ ሽዋ ዳቦ	8
22	ኮዬፌቾ ----ቃልቲ ቶታል	11
1	ሜክሲኮ ----ሽሮሜዳ	8.2
2	አዲሱገበያ ---- መገናኛ	7.5
3	መገናኛ ----ሽሮሜዳ	6.3
4	ፒያሳ---- መገናኛ	6.5
5	ፒያሳ---- ቦሌ	8.2
6	መገናኛ ----ፈረንሳይ	7.9
7	ፒያሳ-----ፈረንሳይ	6.2
8	አውቶብስ ተራ ----- አስኮ	8
9	ሜክሲኮ ----ፈረንሳይ	9.5
10	ፒያሳ-----አዲሱ ገበያ	3
11	4ኪሎ -----ፈረንሳይ	6.2
12	ሽሮ ሜዳ ---- ቦሌ	9.8
13	አራት ኪሎ------ ቦሌ	6.8
14	አዲሱ ገበያ ----ቄራ	10
15	አዲሱ ገበያ ----ቦሌ	11.2
16	ፒያሳ---- ሳንሱሲ	11.1
17	አ/ተራ ----ካሳንችስ	9
18	ፒያሳ---- ፈረንሳይ	6.2
19	መገናኛ ----ፒያሳ	6.5
20	ፒያሳ---- ቦሌ	8.2
21	ፒያሳ---- ልኪንዳ	8
22	አዲሱ ገበያ ----ሱሉልታ	24
23	ፈረንሳይ---- ሜክስኮ	9.5
1	ሃይለጋርመንት ----አየር ጤና	7
2	አለም ባንክ---- ሜክሲኮ	9.9
3	አለም ባንክ---- አ/ተራ/ምዕራብ/	15
4	ከጦርሃይሎች ----ወለቴ	10.5
5	ካራ /አጃንባ-----አዉቶቢስ ተራ	11
6	ካራ/አጃንባ-----ፒያሳ	14.8
7	የሺ ደበሌ-----መርካቶ	8
8	የሺ ደበሌ---- ሜክሲኮ	6.5

9	አየርጤና---- ሜክሲኮ	8
10	ሜክሲኮ ----ካራ	9.2
11	አየርጤና---- ምዕራብ	11
12	ኬላ --- አውቶ/ተራ	18.5
13	አየርጤና---- አ/ተራ	11
14	ሰበታ --- አየር ጤና	14
15	ጦርሃይሎች ---- ሜክሲኮ	3
16	ጦርሃይሎች ---- አ/ተራ	6.2
17	ጦርሃይሎች ---- ፒያሳ	6.2
18	አየርጤና---- ሳሪስ	12
19	ከአ/ተራ ---- ኬላ	18.5
20	ፒያሳ---- አየርጤና	12
21	ፒያሳ-----ቤተል	9.1
22	ሜክሲኮ -----አለምባንክ	9.9
23	ከአየርጤና----- ሜክሲኮ	8
24	አውቶብስተራ---- ሳሪስ	11.2
25	አውቶብስ ተራ ----ጀሞ 1	9.8
26	አ/ተራ ---- ካራቆሬ	11
27	ከም/ ሆቴል ---- ዓለምባንክ	15
28	አውቶብስ ተራ ----እስፔን	6.2
29	ከአውቶ/ተራ ---- አየርጤና	11
30	አለም ባንክ-----ፒየሳ	15.5

Annex III: Number of buses on the root and number of passengers for 11 and half months (Sheger bus)

ሸገር የብዙሀን ትራንስፖርት አገልግሎት ድርጅት
Sheger Mass Transport Service Enterprise

የ2014 በጀት ዓመት ዓመታዊ ሪፖርት					2014 ዓ.ም
I. የ2014 ዓ.ም ዓመታዊ የመደበኛ አውቶቡስ ሪፖርት					
ዴፖ	የተሰማራ አውቶቡስ	ነጠላ ምልልስ	ኪ.ሜ	ተሳፋሪ	የተሰበሰበ ገቢ
ሳሚት	67	258,516	3,585,570	18,795,212	75,212,858
ሸንሌ	58	247,257	2,690,920	15,040,294	61,470,177
ቃልቲ	63	251,585	2,688,590	16,404,470	63,033,071
መካኒሳ	30	145,686	1,784,790	7,182,677	29,610,892
ድምር	**218**	**903,044**	**10,749,870**	**57,422,653**	**229,326,997**
በቀን		**13**	**155**	**829**	**3,311**

Annex IV: Number of buses on the root and service roots (Anbessa bus)

መስመር ቁ	መነሻ	መድረሻ	ምድብ አውቶ
	የካ አባዶ	ፒያሳ	
1			8
2	መካኒሳ ቆሬ	አዲስ ከተማ	4
3	አየር ጤና	**ም.አደባባይ**	9
4	ቃሊቲ	አድስ ከተማ	
5	መካኒሳ ቆሬ	**ም.አደባባይ**	4
6	ቄራ	ሰሜን አዲሱ ገበያ	8
7	መገናኛ	አሌልቱ	3
8	ቀጨኔ	አዲስ ከተማ	3
9	ብራስ ክሊኒክ	ፒያሳ	4
10	ኮተቤ መምህራን ኮሌጅ	ፒያሳ	6
11	ኮልፌ እፎይታ	ም.ሆስፒታል	
12	ፈረንሳይ ፌልም ማዕከል	አዲስ ከተማ	8
13	ጣልያን ኤንባሲ	አዲስ ከተማ	3
14	ሳሪስ ኦቦ	ፒያሳ	6
15	መገናኛ	አዲስ ከተማ	4
16	ኪዳነምህረት	አዲስ ከተማ	6
17	ቁስቋም	አዲስ ከተማ	6
18	ቀራንዮ	አዲስ ከተማ	6
19	ሳንሱሲ	ፒያሳ	38
20	ድል ብር	አዲስ ከተማ	4
21	ፌሊ ዶሮ	አዲስ ከተማ	6
22	ሰሚት ኮንዲሚኒየም	ለገሀር	6
23	ላንበረት	አዲስ ከተማ	5
24	ድሬ ሶሎሊያ ቡራዩ	አዲስ ከተማ	4
25	ለገሀር	አቃቂ	6
26	አዲስ ከተማ	ሰበታ	4
27	ሜክሲኮ	ገላን	10
28	አስኮ ሳንሱዚ	አዲስ ከተማ	4
29	አዲሱ ሰፈር ገብርኤል	አዲስ ከተማ	
30	ሱሉልታ	አዲስ ከተማ	12
31	ለገሀር	ሸሮ ሜዳ	10
32	ሃና ማርያም	ለገሀር	6
33	ኮተቤ ገብርኤል	አራት ኪሎ	5
34	ጀርመን/አደባባይ	አዲስ ከተማ	4
35	ለቡ ሞዚቃ ሰፈር	አዲስ ከተማ	4

36	ካራ ቆሬ	ለገሀር	4
37	ቀራንዮ	ም.አደባባይ	3
38	ጀር/አደባባይ	ስድስት ኪሎ	4
39	ቦሌ ት/ቤት	አዲስ ከተማ	
40	ካራአሎ	አዲስ ከተማ	4
41	ኢየሱስ	መርካቶ	4
42	መገናኛ	በቦሌ ለገሀር	2
43	መናገሻ	መርካቶ	2
44	ለገዳዲ	መርካቶ	2
44ልዩ	መገናኛ	ለገዳዲ	22
45	ለገሀር	ድል በር	4
46	ገርጂ	አራት ኪሎ	4
47	የነገው ሰው ት/ቤት	መርካቶ	3
48	ቦሌ ሚካኤል	ም/.አደባባይ	6
49	ጨፌ አያት ኮንዲሚኒየም	መገናኛ	4
50	ኬንተሪ	ጦር ሀይሎች	6
51	ቤተል	አዲስ ከተማ	4
52	ገርጂ	መርካቶ	6
53	ቦሌ ሚካኤል	ሽሮ ሜዳ	8
54	ላፍቶ	ሜክሲኮ	5
55	ለገሀር	ጉራራ	5
56	ሳሪስ አቦ	ሽሮ ሜዳ	6
57	ካራ	ለገሀር	
58	አለም ባንክ	ለገሀር	4
59	ቤተል ሆስፒታል	ም.አደባባይ	5
60	ደብረዘይት	ለገሀር	10
61	ጨፌ አያት ኮንዲሚኒየም	ለገሀር	8
62	ሰበታ	ለገሀር	3
63	ሚኪሊላንድ	አዲስ ከተማ	4
64	ጉራራ	መገኛ	5
65	መርካቶ	አለም ባንክ	6
66	አዲስ ከተማ	ካራ ቆሬ	6
67	ጆሞ	ለገሀር	4
68	ጣር ሃይሎች ሆስፒታል	ም.ሆስፒታል	4
69	ሰሳንሱሲ	ቦሌ ለሚ	4
70	አጃምባ	ጊዩርጊስ	4
71	ቃሊቲ	ለገሀር	2
72	ሃና ማሪያም	ሳርስ አቦ	4
73	ለገሀር	ዊንጌት ት/ቤት	4
74	ሲኤምሲ አደባባይ	በግዮን መርካቶ	6
75	6ኪሎ	ቄራ	6

76	መገናኛ	ቃሊቲ	6
77	አየር ጤና	ቄራ	4
78	መገናኛ	ጎፋ ካምፕ	
79	አራት ኪሎ	ሳሚት ኮንዲሚኒየም	4
80	መገናኛ	ሽሮ ሜዳ	4
81	መገናኛ	ሳንሱሲ	6
82	ጎሮ አደባባይ	መገናኛ	10
83	ጨፌ አያት ኮንዲሚኒየም	6ኪሎ	5
84	ኮልፌ ዕፎይታ	ለገሀር	4
85	አዲስ ከተማ	ሆለታ	4
86	አየር ጤና	ቆርኪ	6
87	ውንጌት ት/ቤት	አየር ጤና	7
88	አዲስ ከተማ	ጫንጮ	4
89	አዲስ ከተማ	ሰንዳፋ	3
90	ቤተል ሆስፒታል	ለገሀር	5
91	ከአዲስ ከተማ	ተጂ	2
92	ሃና ማርያም	ባልቻ ሆስፒታል	2
93	ቦሌ ቡልቡላ	መገናኛ	4
94	ፒያሳ	ሚኪሊላንድ	2
95	አዲስ ከተማ	አዲስ አለም	4
96	ቱሉ ዲምቱ	መገናኛ	4
97	መገናኛ	ለገጣፎ ሚሽን ት/ቤት	5
98	ዱከም	ሳሪስ አቦ	4
99	ከአየር ጤና	አለም ገና ሚከሸል	4
100	ከጀሞ	አዲስ ከተማ	6
101	ከመገናኛ	አባ ኪሮስ አደባባይ	6
102	ካራ	ለገሀር	6
103	ምኒሊክ አደባባይ	ጀሞ	6
104	ቃሊቲ	ቄራ	2
105	አንፎ ሜዳ	ለገሀር	4
106	ኮዩ	ሜክሲኮ	4
107	ሳሪስ አቦ	አቃቂ ቆርቆሮ	
108	አስኮ አዲሱ ሰፈር	ፒያሳ	6
109	ሳሪስ አቦ	ቱሉ ዲምቱ	4
110	ስድስት ኪሎ	ቱሉ ዲምቱ	
111	ፒያሳ	ድሬ ሶሎሊያ	4
112	ክብ መስመር		10
113	መገናኛ	ፈጩ ቆዪ	9
114	ገላን	ለገሀር	4
115	ሜክሲኮ	ሰፈራ	8
116	ጀሞ ቁጥር 2	መካኒሳ ሚካኤል	4
117	ሀ/ጋርመንት	ሜክሲኮ	12

118	ከታጠቅ ኬላ	መርካቶ	3
119	መገናኛ	ስሚት ኮንዶሚንየም ገቢ	4
120	መገናኛ	ቂሊንጦ	6
121	ቱሉ ዲምቱ	ሜክሲኮ	14
122	አራት ኪሎ እንጦጦ ማሪያም ቤ/ክ		4
123	ፒያሳ-----	አለምባነክ ስላሴ	4
124	መገናኛ	ቱሉዲምቱ	21
125	ሀ/ጋርመንት	መገናኛ	8
			675