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The passengers' satisfaction with public bus service among middle-income users in Greater Cairo

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THE PASSENGERS' SATISFACTION WITH PUBLIC BUS SERVICE AMONG MIDDLE-INCOME USERS IN GRETER CAIRO

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ABSTRACT

Public transport is an essential demand to ensure ease mobility for all the citizens to fulfill different life activities such as work, education and health. Passengers, around the world, search for a convenient bus service responds to their needs such as coverage, regular time table service, safety, facilities within terminals, better atmosphere inside the vehicle during the trip, and affordable fare. However, these basic needs are deteriorated on many countries due to lack of efficiency and responsiveness of the service operators. The aim of this study is to understand the most critical factors that influence on the passengers' satisfaction with the public bus service in Egypt from the perspective of middle-income users specifically in both Cairo and Giza governorates. A qualitative study had been conducted in three main bus Terminals located in Tahrir, Boulak El Dakror and Lebanon Square in Cairo and Giza governorates. A sample of 40 passenger has been chosen based on different set of criteria include age, reliance of the service and monthly income. The analysis identifies the five categories that are essential for passengers of the public bus service. The first category is the facilities within the bus terminal which include secured waiting areas, bathrooms, cleanliness, lighting and personal security. The second category is the conditions of the vehicle that include design, drivers' behavior and information during the trip. The third category is the bus fare and to what extent passengers can afford to the bus service in Greater Cairo. The fourth one is the accurate time table that organizes the service during different working hours. The final category is the additional options for the passengers to improve the mobility and reduce stress during long trips. To improve the service, the operators have to include the passengers' perceptions and opinions on the evaluation process as the passengers represent the backbone of the bus service and interact directly with the service weaknesses.

Key words: Public transport; mobility; passengers' satisfaction; service reliability; service affordability; intensity of the service

List of Acronyms

AVL: Automatic Vehicle Location

CAPMAS: Central Agency for Public Mobilization and Statistics

CMO: Cairo Metro Organization

CTA: Cairo Transit Agency

ENR: Egyptian National Railways

GCBC: Greater Cairo Bus Company

IRB: Institutional Review Board

MOT: Ministry of Transportation

MT: Misr Transportation

PT: Public Transport

QAU: Quality Assurance Unit

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Chapter 1: Introduction

1.1 Introduction

Countries, across the world, exert numerous efforts in providing welfare services such as healthcare and education to ensure qualified services provision for all the citizens. However, these efforts cannot be achieved without an accessible and affordable transportation system that guarantees a permanent connection between citizens and the state services (Gunaruwan & Harshanee, 2015). According to the World Bank, transportation is a key partner on supporting the economic and social development. As for the side of economics, transport creates a competitive market for sharing jobs and economic growth. Socially, it enables access to education and healthcare services that formulate the core of better living conditions (World Bank, 2016). With the advance of better transport networks, people can mobilize and communicate easily and access to public services (ibid). For many middle-income users in Greater Cairo, transport represents a dynamic mode of mobility to access to different life activities.

Many countries share common aspects of the crisis of public transportation especially the affordability and accessibility to all users. Other issues related to over crowdedness, efficiency, safety, and appropriateness have negative impact on reducing the quality of public transport services and customer satisfaction (Massod, Khan & Naqvi, 2011). In addition to what has been mentioned before, the financial resources that some countries provide to improve the transport services in order to attract more users to depend on the service instead of relying on private cars are inconvenient. (Motta, Da silva & Santos, 2013).

The success of transport services have become a challenge for most of countries because the users obligate the service providers to change the traditional way on

improving the service to other strategies that allow users to participate on the transport service improvement process (Tyrinopoulos & Antoniou, 2008). Ensuring such participation can increase the rate of satisfaction and loyalty of the users (ibid).

Users of transport services are a dynamic part of assessing it due to the importance of their perceptions and demands which allow the service operators to find dynamic solutions to the service's gaps and raise the efficiency of the transport services (Markus & Margareta, 2008). Concentrating on the users' demands and choices can enable transport service providers to improve the performance of their services and increase the competitiveness of the transport market (Hu, Zhao & Wang, 2015).

The aim of this thesis is to understand the factors that play a role on the public bus service based on the perceptions and demands of the middle-income passengers. The factors either on bus terminals or during the journey can influence the decision of users when deciding to rely on the service. These factors can improve the relation between the service providers and the users. Besides, the study will discuss the role of engaging service users on improving the quality of bus service provision and passengers' satisfaction. In addition, the study will shed a light to the influence of the smart bus service on the quality of the public transport services. Finally, the study will provide set of policy recommendations concerning how to involve service users' on assessing the quality of the service.

1.2 Statement of the study:

There are many efforts worldwide to improve the public bus service in order to make the service accessible and affordable for all users. The most important factor behind the success of such improvement efforts is the satisfaction of users who depend on this service in their daily life. Users' satisfaction is the main indicator of service success either public or private. For example, Sanjay, (2016); Shen, Feng, Li & Hu, (2016); Moeinaddini, Shah& Sultan, (2016); Nwachukwu, (2014); Shaaban & Khalil, (2013) have pointed out the dynamic role of passengers' satisfaction on the public bus service and how passengers' trust with the bus service improve the relation with the service operators.

Satisfaction of bus passengers is a key element of the quality of the service provision due to its role on formulating the consumer preference to use and depend on the service regularly (Fellesson & Friman, 2008). However, when the service providers decide to improve the service, they ignore the role of the users as a core part on the improvement process and have an active interaction with the service weaknesses (ibid).

Accordingly, passengers' satisfaction is an important factor in determining the efficiency of the public bus service. Being aware of citizens' demands can support the development strategies of the bus service providers and improve their capacity to improve the bus service provision. Issues such as irregular schedules, timetable information, number of routes, coverage, behavior of drivers, facilities, and fare pricing are some factors which portray the users' satisfaction with the service and the ability of the providers to perform a better task.

1.3 Research Objective

The main objective of the study is to provide the bus transport operators with a full understanding to the Egyptian mentality when chose a service to depend on rather than other provided services. The map that most of users can follow concentrates on responsiveness, efficiency, facilities and pricing.

1.4 Research Questions:

The Main Research Question:

-Based on the perceptions of the middle-income users, what are the essential features of better public transport system in Greater Cairo?

Side Questions:

- Why do middle-income users depend on the bus service rather than other transport services?

-To what extent can bus fare affect the monthly income of the users based on the perceptions of the middle-households?

- What is the latest improvement on the bus service that reflected an appropriate level of users' satisfaction?

- What is the importance of engaging passengers on assessing the bus service?

1.5 The organization of the study

The study is organized as following:

Chapter One is the introduction section which includes a brief description of the role of transportation in the society and the relation between satisfaction and service quality. The chapter concludes in the statement of the study and the research questions.

Chapter Two is the overview of the literature about two main areas that include the relationship between the users' satisfaction and the service performance in the public service provision and the quality dimensions of bus service based on three main regions in Europe; Latin America and Africa.

Chapter Three is the conceptual framework section that has been designed by the researcher.

Chapter Four is the methodology adopted by the researcher including the approach, the sample, the recruitment strategies of the sample, data collection methods, the ethical considerations and procedures, and study limitations.

Chapter Five is the public transport in Greater Cairo from five main sides include an overview of the system, main operators of the transport services, the government spending on transport services, households spending on transport services and the lunched smart service adopted by bilingual cooperation of Mosalat Misr and CTA

Chapter Six is the main findings of the data analysis which provide the main factors influence the middle-income users with the public bus service, the influence of the smart service and to what extent their engagement can help the bus operators

Chapter Seven is the conclusion section with some policy recommendations to improve the public bus service in the studied areas.

Chapter 2: Literature Review

Based on scholars' opinions, the study has discussed the relationship between bus service quality and users' satisfaction from two different perspectives. The first one is the relationship between users' satisfaction and government performance on the area of public service provision to identify to what extent users' satisfaction with public service can improve the public trust to the state power. The second perspective is the dimensions of the bus service quality which influence the passengers in different parts of the world such as Europe; Africa and Latin America to point out what people search for when they want to rely on the bus service.

2.1 The Relation between Users' Satisfaction &Government Performance in Public Service Provision

The relation between the users and the government is important because it explores to what extent the government fulfills the demands of the citizens. In addition to this, it enables users to assess the performance of the government on the area of services provision. On this basis, the study has reviewed some literature concerning the association between the users' satisfaction and the government performance in public services provision.

Kampen, Van De Walle & Bouckaert (2006) described how citizens' satisfaction associated with public services can influence both the public trust and the government performance. They claimed that modern democracies suffer from limited citizens' trust due to lack of the quality of public services. Accordingly, the state power becomes decreased and dissatisfied users gradually increased (ibid). This study concluded with two main issues which addressing the relation between the users' satisfaction and the public trust. The first is the efforts of public institutions to reduce the gap between the public interest and the service quality. The other issue is building

effective communication with the users in order to assess their perceptions and demands associated with the provided services (ibid).

Similarly, Montalvo (2009) studied the correlation between the users' satisfaction and the government performance on the area of municipal services delivery. He noted that on some Latin American countries, the public agencies gave more attention to citizens' opinions and interests as a dynamic policy to evaluate the provided services and improve the interaction with users (ibid). In addition, he connected the value of practicing good governance with the way citizens participate on the structure of public services provided to ensure quality and responsiveness of such services. The study concluded that decentralization is an essential component of improving the users' satisfaction with the public services especially the case of the rural citizens who suffer mostly from deteriorated services.

Another study by Salim, Peng, Almaktary&Karmoshi (2017) who tried to point out the impact of citizens' satisfaction on the government performance on the area of services provision in Urban Yeman. The study used two measurements to highlight the relation between satisfaction and services provision. The first one was the relation between satisfaction and trust of government in which more users' satisfaction generates a supportive power to the government authority (ibid). While the other measurement was the relation between satisfaction and the level of corruption in services provision that can increase the gap between the government and the citizens (ibid).

The study highlighted the attitude of participants who expressed high level of disagreement with the deterioration of public services and how this affects their expectations to the government performance. Most of them had negative consequences as a reaction to low performance such as refusing to pay taxes and obey

the role of law as a way to express dissatisfied behavior (ibid).The study concluded that there is strong correlation between trust, satisfaction associated with provided services, and performance of the government.

In United States, Roch & Poister (2006) conducted an empirical study to explore the relationship between citizens' expectations, perceived performance and satisfaction in the field of public service provision. They chose three main services on the state of Georgia including trash; police and school to find out how the residents at this state can react to the quality of the provided services and how these services can influence their satisfaction (ibid). The study was conducted through a random survey included 744 resident in Georgia. The residents were asked to rate the perceived performance for each service in order to determine what can drive citizen to choose one service over the other (ibid). Based on the survey results, most of respondents reported that efficiency, responsiveness, reliability, timing, affordability and demographic coverage are the essential elements when assessing a public service. In addition to, citizens have basic demands when applying to a service whenever these demands are achieved, the rate of satisfaction becomes increased (ibid). Moreover, the results opened the gate for paying more attention to the quality of public services which were reflected on the level of the users' satisfaction. Finally, the study has opened a future plan for another investigation to consider the user's satisfaction associated with public services as an indicator of good governance (ibid).

While in Norway, Christensen and Laegreid (2002) pointed out the relationship between the trust in government and the level of satisfaction with public services provision. The study included over 2000 Norwegian who use different services provided by the public sector in Norway. The participants were asked to record their

opinions about the quality of the provided services and how these services can fulfill their basic demands and achieve some level of satisfaction (ibid).

According to the respondents of the participants, researchers had noted that:

1. Citizens' trust with one of the governmental institutions provided a public service can be extended to include other institutions that provide other services.

2. There is a strong correlation between citizens' satisfaction and trust in public services provided by the government. For example, the users' who have negative image with a service provided by the government are most likely to have insufficient relation with public officials. In the contrary, users who have a positive experience with public services are likely to increase trust with government and support the state power in all its affairs.

3. Users' engagement in evaluating the public services can positively influence the level of satisfaction because users are the main player on assessing the provided services and whether this service has a positive outcome or not is the responsibility of users. This participation on evaluating public services can strength the relation between the state and the citizens.

Park & Blenkinsopp (2011) studied the impact of dissatisfaction on the public services provision in South Korea. They noted that the level of dissatisfaction associated with public services can reduce the users' trust on government performance and increase the gap between the state and the citizens. The main results of this study were the importance of building a transparent relation with users to ensure the quality of delivered services and the necessity of engaging citizens in evaluating the public services to ensure that their demands and interests are highly included in the public services system.

2.2 Quality Dimensions of Public Bus Service

The purpose of this section is to find the factors that influence on the bus service users in three different regions in the world including Europe, Latin America and Africa. The main outcome of this investigation is to gain some knowledge related to the preferences of bus passengers when deciding to rely on the service and to what extent this impact can affect on their satisfaction.

2.2.1 Studies in Europe

In Sweden, Friman, Edvardsson and Garling (2001) conducted a mail survey to explore the quality attributes that influence the bus passengers. The participants were 997 bus users and were asked to rate two models of questionnaires (ibid). The first model was the attributes that used to measure the bus service satisfaction on users and included treatment by bus terminal staff, service reliability, recovery and flexibility of information to guide users either on board or during the journey (ibid).

The other model was the experienced incidents by the service users who had a negative image of the bus service and was a barrier to depend on the service regularly. The proposed model included early departure or late one, drivers' behavior during the journey, unplanned stops affecting the journey time, careless driving, fare structure, crowding and comfort on the vehicle.

Based on the survey results, over 73% of the participants have agreed that both service reliability and service information either on the terminal or on the vehicle are main attributes of passengers' satisfaction with bus service. While both staff attitude and terminal design are fewer demands of bus users. On the other side, the experienced incidents by the participants were influenced by service reliability and time management in a clear sign that both factors have a great role on the relation between service provider and users (ibid).

Another study was conducted by Paulley, Balcombe, Mackett, Titheridge, Preston, Wardman, Shires & White (2005) in Great Britain to point out the influence of bus service fare on the users' satisfaction. The fare is important revenue for the local officials and state's budget, but the planning of fare is a mandatory issue to ensure the affordability of the service to all the service users (ibid). The study referred to two main strategies when assessing the service fare. The gradual increase on the service fare can cause a reduction on the rate of passengers that leads to limited income source (ibid). Second, the structure of the fare should be balanced with the journey distance in which long distances have high fare and short distances have less fare (ibid). This study was a unique because it concentrated on the fare structure and how this influences negatively the income of users.

While in Italy, both Eboli and Mazulla (2007) described the quality factors that impact on the passengers' satisfaction with a bus service in Cosenza, Italy. The authors used 16 service quality factors in order to identify the priorities of the participants. The factors included service frequency, bus stop availability, service reliability, route characteristics, bus stop furniture, bus capacity, cleanliness, fare, service information, promotion, complaints, and safety on board, personal security, environmental protection and service maintenance (ibid). Based on the participants, the most important factors associated with passengers' satisfaction with the bus service were service reliability that is related to timetable, service frequency, information, promotion, safety, and personal security (ibid).

Similarly, Paylina (2015) highlighted the factors that impact on the bus passengers in the city of Ostrava, Czech Republic. The study included 592 participants who were regular bus users on the city of Ostrava. According to the study results, the researcher has classified the factors into two subjects. The first one was the essential factors that

the passengers searched for when relying on the service which represented on spatial coverage, service schedules, service information and operational number of buses (ibid). On the other hand, service fare, staff behavior, speed, and safety were the least important factors to the passengers' choices (ibid).

On the other hand, Beirao & Cabral(2007) highlighted the dissatisfaction factors that influence the bus transit service in Porto. The participants reported that lack of comfort, waste time, unreliability, long waiting times, lack of flexibility, time uncertainty and lack of control were the main problems on the bus transit service (ibid).

In Romania, Androniceanu (2016) provided set of recommendations to improve the quality of transport services to attract more users based on a survey included 384 citizens in Bucharest. On the survey, the participants asked to highlight the main factors that influence on the quality of PT services. According to the respondents' ratings, the most critical factors that impact on their choices for PT services were safety, comfort, design of the stations and the guided information either on the board or during the journey (ibid). On the other hand, the least important factors affecting PT services were speed, coverage and fare (ibid). To set a plan for improving PT services in Bucharest, the researcher recommended the following strategies:

- Improving the infrastructure on the terminals and on the journey including comfortable seating and other additional services that raise the users' satisfaction;
- Improving the safety and security of both passengers and vehicles through installed video cameras on stations and on vehicles;
- Free access to internet either on board or during the journey;

- Responsiveness to all the passengers' feedbacks as it influenced their level of satisfaction and
- Using modern techniques in ticketing to ease the movement of users.

2.2.2 Studies in Latin America

There are limited scopes in Latin America to highlight the quality of public transport services and the satisfactory factors that influence users. The researcher pointed out two studies in Brazil and Chile. The first one discussed the crisis of public transport services in Brazil and how these impact negatively on the users. On the other hand, the other study concentrated on the bus drivers' behavior as a vital part that influences the PT services and its users.

In Brazil, Motta, Desilva & Santos (2013) studied the crisis of PT services and negative consequences on the users. They claimed that the Brazilian Bus System had witnessed many weaknesses over the last 30 years due to lack of investment in road networks, absence in equality in providing public services, lack of planning an efficient bus system responding to the needs of Brazilian citizens and lack on infrastructure to the majority of bus stations and bus vehicles" capabilities. In addition to this, there was the absence of policies that regulate the fare structure which lead to add more financial burdens on the poor sector and restrict their affordability of PT services in most of Brazilian cities (ibid).

The study recommended three strategies to enable the Brazilian government to achieve a progress on the public transport services. First, there should be efficient road networks planning to connect most of Brazilian cities and can reduce the obstacles of moving from one place to another. Second, there is a demand to activate the social security programs that protect the poor rights to find an affordable and accessible PT services. The final demand is controlling the market prices of the needs

of PT especially the gas prices in order to maintain the service fare in the hand of the poor.

Another study was conducted by Tizando, Galilea, Delgado and Niehaus (2014) in Chile where they studied the impact of providing financial incentives to the bus drivers to improve their behavior toward the users of bus service.

The authors claimed that the low performance of bus drivers is related to the absence of financial incentives and this can lead to negative incidents with the passengers. To test their hypothesis, they interviewed 100 bus drivers to highlight their barriers to provide a qualified service.

The drivers reported that there are two major concerns that influenced their performance. The first one is the bad relation with passengers during the journey, while the other concern is the bad working conditions designed by the terminal operators (ibid). On the side of bus passengers, the drivers affirmed that passengers were in a regular clash with them due to the stop points and bus speed (ibid). On the other hand, the bad working conditions were represented in long working hours, work shifts and rest time (ibid).

The study concluded with the following recommendations:

- Working on improving the conditions of the bus drivers through offering financial incentives related to their work performance not users evaluation;
- Regulating the relation between the service operators and the drivers through work schedules, rest time to be divided equally, and work shifts to be prepared in a weekly manner.

These plans can increase the drivers' loyalty and reflect positively on their performance during the operating hours.

2.2.3 Studies in Africa

The study highlighted the main factors that influence passengers' satisfaction with bus service in four countries in Africa. The studies included Egypt, Ghana, Nigeria and South Africa.

Nwachukwu (2014) highlighted the most important factors that associated with public bus service in the city of Abuja in Nigeria. Based on his analysis, comfort during the journey is necessary for the bus commuters. Comfort includes comfortable seats, enough leg-space and open window for better ventilation. In addition, the number of buses to reduce high density of passengers in peak times and facilities in the bus stops are essential to ensure the mobility of passengers.

In a study conducted in South Africa, Govender (2014) attempted to identify the perceptions of bus users by using a service quality instrument called the Regional Estuarine and Coastal System of the Americas (RECSA) which has five main attributes to measure the quality of public transport service. Based on interviews with 690 bus commuters, the bus service quality was strongly correlated with service reliability where arriving on time as main priority, extent of the service from two main angels included total service hours and service in the evening, comfort in seating and air flow, safety from accidents and assaults and affordability with cheap fare and seasonal tickets system (ibid).

Aidoo, Agyemong, Monkah&Afukaar (2013) conducted a study to evaluate the passengers' perceptions of Kumasi-Accra bus route on Ghana. Based on the respondent of 550 passengers who participated on this study, cleanliness of the bus terminal, availability of waiting areas on the terminal, drivers' attitude and personal security on the terminal were the most important elements of the bus service that influence their satisfaction. As for service fare and route schedule, they were the least important factors that influence their choices (ibid).

In Egypt, there was a limited scope highlighted the crisis of public bus service specifically from the side of the passengers satisfaction. Osama, Mahdy, Kandil & El habiby (2016) studied the problem of public bus service from the perspective of service reliability and how this affects the bus service in Egypt. In their methodology, they have used an Automatic Vehicle Location (AVL) to monitor a bus route to determine the causes of trip late and how this affects passengers' arrival time. AVL enables to find routes drivers who randomly use unofficial bus stops that lead to deviations in the bus trip (ibid).

Accordingly, late arrival has caused many negative consequences on passengers' activities such as work and others. The authors have recommended that AVL with its technological features such as determining locations, transmitting data and measuring actual arrival time can solve the crisis of service reliability and create effective intervention to improve the public bus service in Egypt.

Based on what has been mentioned, quality factors differ from culture to another according to the capabilities of the country to cope with the global changes in the field of Public Transportation. All the studied countries are share common factors represent in facilities within Bus Terminals and conditions of the vehicle before the trip. On the other hand, some countries share in the necessity of a staple fare prices due to the income context in some countries and not to add heavy burdens in the citizen.

Besides this, other countries show great attention to involve passengers in improving the bus service through listening to their opinions and perceptions about the service which carry the weaknesses before strengths. This strategy has an effective outcome because it creates a democratic community and support the establishment of good governance.

Chapter 3: Conceptual Framework

This chapter presents the conceptual framework that has guided the researcher to address the main parts of the study. According to Adom, Hussein and Agyem (2018), conceptual framework is a structure method adopted by the researcher to provide accurate image of how the research problem can be explained. It provides simple strategy to address the main agenda of the studied phenomena (ibid). The section started by providing definitions to the key elements of the conceptual framework. Then, it provides the adopted framework by the researcher to enable him in identifying the main factors influencing bus passengers' satisfaction.

Definitions of key elements:

- Service quality

Simkova, Konecny, Liscak and Stopka (2015) have defined the word "quality" as the degree that referred to the excellence of services and goods in society and the ability to provide full requirements to the customer service either to fill their demands or to improve their retention. Based on their classification, service quality has eight main dimensions that influence on the public transport users including, availability, accessibility, information, time, customer care, comfort, security and environmental impact (ibid). At the same time, Parasuraman, Zeithaml and Berry (1988); Gronroos (1984) defined the service quality as "a comparison between customer expectation and perception of service". They categorized the service quality into five dimensions including; tangibles (facilities and equipment), reliability (do the service in accurate time), responsiveness (support the customers' needs), assurance (trust and confidence of the customer) and empathy (understand customers' demands) (as cited in Budiono, 2009). To the prospective of middle-income commuters, quality in public bus service

means facilities in bus terminals, accurate information about spatial coverage, timing of the bus trips and reducing commuters" density especially in peak times. On this basis, service quality deals with basic needs of the bus users that summarize in upgrading the current status of the transport service.

- Customer satisfaction

The customer is an important participant in assessing the provided services in which good standard of these services can increase the level of satisfaction, and in the contrary low quality can decrease the customers' satisfaction. Oliver (1997) has defined satisfaction as the fulfillment of users' perceptions toward provided services. Customers have special demands when receiving public services which are reflected on their level of attainment (ibid). He, also, acknowledged that satisfaction generated through the process of customer's judgment to all the characteristics of the service includes effectiveness, efficiency and responsiveness (as cited in Budiono, 2009). As for, Tyrinopoulos and Antoniou (2008), they have defined customer satisfaction associated with the public transport service as the achievement of all the customers' expectations that include responsiveness, information, facilities, time and safety. These measurements increase the customers' loyalty as a main consequence of customers' satisfaction (ibid). To achieve these definitions on the Egyptian context, a wide assessment to the public bus service should be concentrate on the bus commuters as they represent the vital part of the service. Satisfaction means achieving a proper side of the people needs and expectations.

- Service Accessibility

Accessible to services is a dynamic factor when assessing the impact on users and the opportunities of the state's officials to provide equal rights for all the citizens to use the public services. According to Carruthers, Dick and Saurker (2005)

accessibility in public transport referred to the ease for all passengers' levels to use the transportation services without any kind of barriers and restrictions. They identified the criteria of accessing the PT services which included appropriate geographical distribution to the bus terminals, locations of bus stops and find out all journey's possibilities such as route information (ibid).

- Service Affordability

Passengers search for economical transport services to be a convenient plan to their monthly income in which they can continue other life activities. Affordable PT services guarantee full access to work, education and health for all the users whatever their financial capacity is. Carruthers, Dick and Saurker (2005) have defined affordability as the financial cost of public transport services which put the passengers in direct decision to depend regularly or not depending on these services. This decision can impact negatively on other life activities due to the inability of the citizen to pay for other essential activities such as education and health (ibid). The design of PT services pricing should guarantee an advantage to the passengers to use the service many times and removing the barriers to practice other activities (ibid).

- Service Reliability

Accurate timetable, journey time, information and bus stops are main issues having influence on the quality of the public transport services and users' choices. According to Pavlína (2015), service reliability is a main dominant on assessing the performance of the public bus operators as it increase the retention of the passengers. Reliability in public transport services can be defined as the accurate time table information designed by the service operators to ensure the waiting times, arrival times of the journey and the bus stops during the journey. So, it enables the passengers to determine their actual time per each journey (Moeinaddini, Shah&

Sultan,2016). Lack of reliability in the PT services can decrease the trust between the bus operators and the users which negatively push users to search for alternatives to the PT services (ibid).

To answer the study questions, the researcher has adopted a framework to guide in finding the factors which impact on passengers' satisfaction when relying on the public bus service. The framework can be categorized into five main sections as follow:

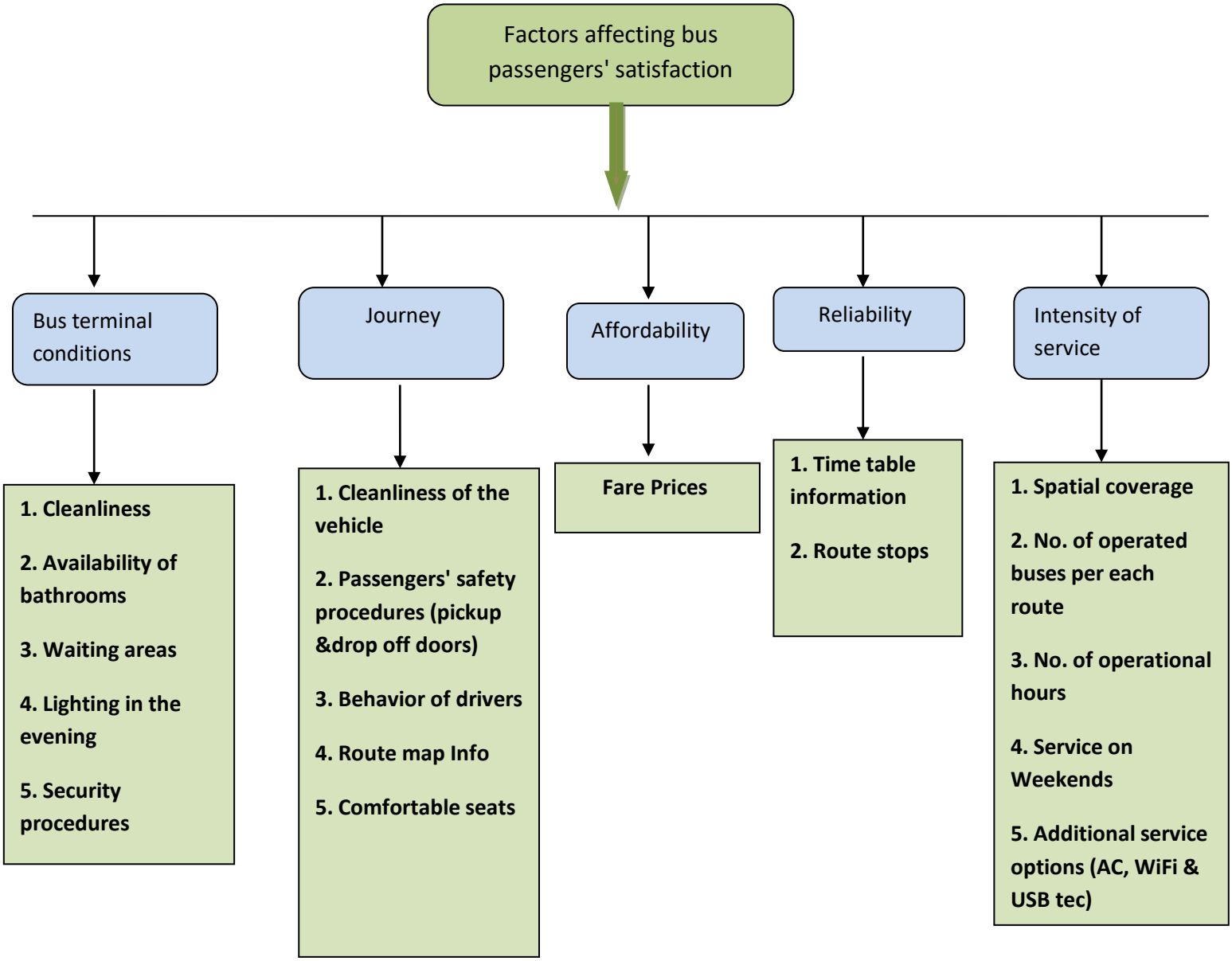

Fig.1: Conceptual framework adopted by the researcher

Based on this framework, bus service quality has five dimensions that influence the passengers' choices. The fist dimension is to what extent the facilities within bus terminal can attract the passengers to use the bus service through finding comfortable waiting areas, bathrooms, safety from any assaults attempts and cleanliness of the terminal. While the second dimension is to prove the ability of the bus operators to provide efficient service during the bus journey through comfortable seats, cleaned vehicles, lighting during evening working hours and qualified drivers to deal respectively with the passengers.

The third aspect is the fare pricing and the extent of users to pay for the service without adding barriers to other living conditions. Furthermore, it is important to organize the service either by time table information or through ensuring the bus stops to be included in the route planning to achieve the fourth factor, service reliability, on the structure of the bus service quality. Finally, the intensity of the service has a dynamic role on the responsiveness of the bus operators to the needs of the passengers through appropriate bus capacity, service hours and what services can attract users during the journey.

Chapter 4: Methodology

The aim of this chapter is to provide the research approach used in this study and the methods used in collecting and analyzing the data in addition to the ethics and procedures that organize the relation between the researcher and the participants (Berg, 2009).

4.1 The Approach used on the Study

The study has adopted the qualitative approach in this study for three main reasons. The first one is the exploratory nature of this study which requires rich data in order to gain understanding to all the problem's aspects (Marshall & Rossman, 2011). The second reason is the importance of collecting in-depth data in order to identify the most critical factors that are associated with the public bus quality in Egypt. The third reason is the essential role of being touched with the experience of individual to explore the factors behind the service quality, where the participants are the main domain to inform the causes of the problem being studied (Berg, 2009).

4.2 Recruitment & Selection of the Study Sample

The researcher has used a set of elements in order to recruit forty participants on this study based on the following criteria:-

Criteria of Recruitment	No. of Participants	
a. Sex	(25) males	(15) females
b. Age	(25) males between 35 and 50	(15) females between 30 and 40
c. Education	(35) educated participants	(5) illiterate participants
d. Employment	(30) employed	(10) unemployed
e. Monthly Income	(20) average between L.E 2000 and 3000	(10) average between L.E 1500 and 2500

f. Reliance on the service	(35) are regular users	(5) are non regular users

Table1: Recruitment criteria of the Sample

The researcher chose these criteria for a number of reasons:

1. Most bus commuters in Greater Cairo are between the ages 30 and 50 who mainly work in regions out of the city centers. On contrary, the other ages less than this category prefer other transport modes especially the underground and the microbuses.
2. Education as a criterion will provide the researcher with a rich data from the participants who have enough experience to identify what they need on the bus system in Greater Cairo.
3. Income for bus commuters is an important tool to assess the degree of service affordability and to what extent they can depend on the bus service or find alternative method.
4. The researcher used the criteria of service reliance to identify why bus commuters are regular users which will identify the satisfaction factors in a deep analysis.

4.3 Collection & Analyzing the Data

First, the study has depended on three main bus terminals in both Cairo and Giza governorates in order to collect the study data. In Cairo governorate, the researcher has collected his data from Abdel Moniem Riad bus Terminal located near Tahrir Square. While in Giza governorate, the researcher has relied on two bus Terminals called Boulak El Dakror and Lebanon square.

Second, the researcher has divided the timing of collecting the data into peak hours and normal ones in the evenings. Added to this, there were some collections on the weekends to identify how the bus passengers perceived the service during their weekends.

Third, the researcher has conducted semi-structured interviews with forty participants. Each interview lasted 30 minutes using audio-typed strategy after taking the permission of the participants. The researcher used the recordings to write the transcript that was analyzed according to the factors associated with passengers satisfaction covered in the literature review.

Fourth, the researcher has used a thematic approach on organizing and analyzing the data. He has used the transcripts to review the factors associated with public bus service according to the main findings of the literature. Under each factor, he stated the main findings used the quotes of the participants supported with the main factors of the literature review.

4.4Ethical Considerations

The researcher has obtained the Institutional Review Board (IRB) approval on April, 2018 before he collected his data to ensure the freedom of all the participants in the study. The IRB is a policy designed by many professional universities and associations that seek protecting human and animal from any harm when included in researches in addition it is a required policy for those who seek for funded support (Marshall & Rossman, 2011).In addition to this, an informed consent form was written in both Arabic and English. The purpose of this form is to provide the participants with full information about the nature of the study, using the findings, confidentiality of their data, and any founded risks.

4.5 Study Limitations

Due to the security situation in Egypt after the revolution of 2011 which obligate those who want to collect data from public sites to receive a permit from the national security, the researcher used two ways to collect his data instead of sitting on the bus terminal. The first way was talking with the study sample in the bus during the

journey route after taking his/her approval. The second way was preparing appointments with some service users near the bus terminal, so we can easily communicate without any expected hazards. In addition, there was a strict decision to take some photos of the new service, so I depend on the available photos online to support this section.

Chapter 5: Public Transportation in Greater Cairo

Public transport in Egypt and specifically in Greater Cairo has witnessed several challenges influence the rate of commuters in many Egyptian regions. One of these challenges is the lack of investment to upgrade the service to respond the commuters' demands. In addition, the deterioration of the infrastructure either in bus terminals or the bus stops. Moreover, the prices of fuels that adds heavy financial burdens to the service users whenever a bus fare is changed. These challenges obligate the Egyptian government to improve the public transport compared to the global measurements such efficiency and effectiveness. The aim of this chapter is to shed a light to the public transport in Greater Cairo from three different sides include the identifying of the transport system and main operators, the government spending on public transport, influence of gas prices on public transport fare and efforts of the government to improve the bus service in Greater Cairo.

5.1 Overview of the transport system

During the last 30 years, the transport policy in Greater Cairo has witnessed remarkable aspects that influence the living conditions of the Egyptian households (World Bank, 2000). The policy aspects of the transport system were as following:

- Continuous development of major road infrastructures (bridges over the Nile, urban motorway viaducts, underground carriageways and underpasses, ring roads, radial motorways). Many of these infrastructures are not accessible to public transport in the urban environment

- Development of a heavy metro network over 60 km long along the major transit corridors

- Partial liberalization of the surface public transport network resulting in a considerable expansion of private microbus lines

- Progressive desertion of the tramway network and abandonment of all trolleybus lines

- Failure to build the planned railway links with the planned new towns

- Control and limitation of fare increases on public transport networks in order to progressively make it more accessible to the poorer members of the society

- Extension of the bus network at the expense of the density of supply and of regularity, and without creating segregated lanes as recommended in successive transport and urban studies

- Absence of consultation between the various authorities in charge of transport despite the recommendations in the various transport and master plans

Between the years 1970 and 1998, the transport system in Greater Cairo had abrupt changes as result of increasing the living conditions. These changes in transport market were remarkable with:

- Increase the rate of private car owners

- As a result of high density in Greater Cairo, the use of transport mobility has increased

- Traffic congestion depending on the spatial coverage of the transport service

TABLE 2: Evolution in motor transport uses between 1971 and 1998

Motor Modes	Market Share in 1970	Market Share in 1998
Car and Taxi	13 %	26%
Metro	0%	17%

Tramway	15%	2%
Bus and minibus	62%	19%
Microbus	0%	28%
Sundry (ENR, school and factory buses, boats)	9%	7%

Source: Household surveys in 1971 and 1998 (in travels per main mode).

In addition, the households in Egypt during these years were classified to use the transport modes based on their income levels. The following table presented the categories of transport users compared to the income level:

TABLE 3: Use of motor transports per household income category in 1998

Income level per household per month	Shared taxi	CTA Bus	Metro	Private car	Taxi	Bicycles and motorcycles
Under LE 300	38%	28%	16%	7%	2%	1%
LE 300-LE500	33%	23%	19%	13%	4%	0%
LE 500-LE1000	24%	15%	19%	25%	6%	0%
LE 1000-LE2000	14%	7%	14%	39%	11%	0%
In excess of LE 2000	8%	3%	7%	57%	13%	0%

Source: World Bank urban transport strategy review- The case of Cairo- Egypt

With a quick analysis of this households' survey, the rate of using CTA buses decreased when the level of income steadily increased. The households with high income level got the benefit of owning a private car which had a negative impact on the terrific conditions. Low income level preferred shared taxis and CTA buses because of their affordable fare prices. On contrary, high income level preferred to use a taxi if they have not own a car.

5.2 Transport services operators in Greater Cairo

The public transport services in Greater Cairo can be classified into two sectors include formal and informal one. The first sector is the formal one which its services provided by the public sector through two main service providers include Cairo Transport Authority CTA and Greater Cairo Bus Company GCBC (Mahdy, 2012). CTA is responsible in operating buses, light rail services and Nile ferries. In addition,

there are other organizations in Greater Cairo manage some transport modes such as Cairo Metro Organization CMO which is responsible for the heavy rail services and Egyptian National Railways ENR that is responsible for commuters' rail services (ibid). Both CMO and ENR work under the regulations of the Ministry of Transport, while the CTA is under the responsibility of Cairo Governorate. The informal sector includes minibuses and shared route taxis run by the private sector under the umbrella of the CTA. On a daily basis, over 20 million depend on different public transport modes in Greater Cairo which maximize the value of public transport in Egypt.

CTA with its heavy capabilities is responsible for managing buses, minibuses, trams, metro and Nile ferries with a commuter's capacity exceeds 4 million passengers daily (ibid). Statistics have shown that the rate of bus commuters is the highest one with over 80% followed by the minibus users with over 11%. More than 2% of daily commuters is preferred the air-conditioning buses compared to 2% use the metro on a daily basis.

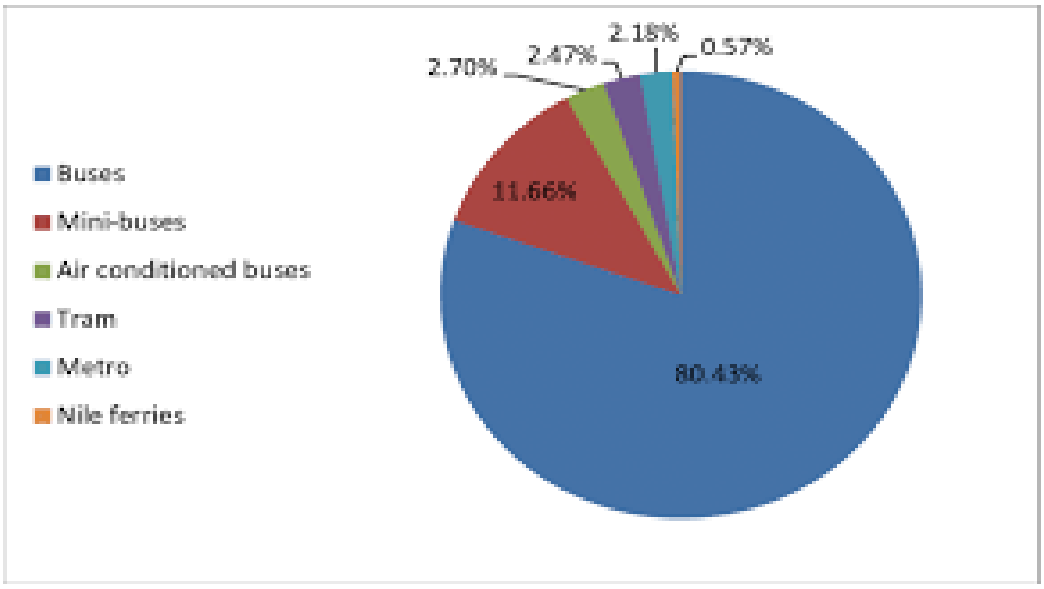

Fig.2 shares of different CTA transport modes

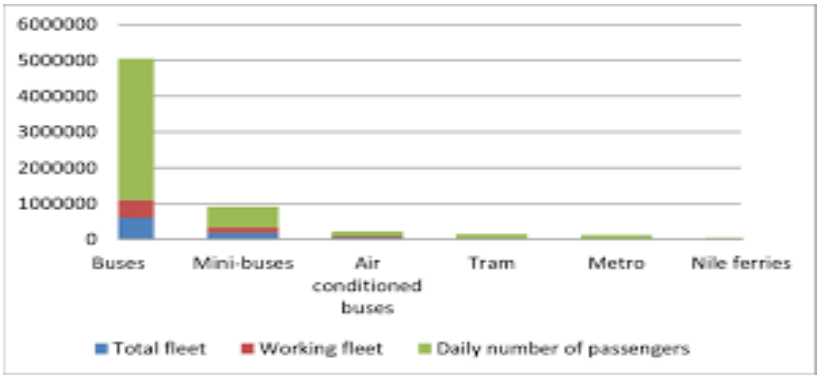

Fig.3 CTA Fleet sizes and daily number of passengers

5.3 Government spending on Public Transport

On the FY 2018/2019 budget, the Egyptian government allocated LE 4 billion, 36 million and 860 thousand pounds to the Cairo Transport Authority divided on the following sides:

- The costs and expenses for the FY 2018/2019 were estimated at LE 2 billion and 642 million and 300 thousand LE distributed as follows: Billion and 520 million and 500 thousand pounds for wages, billion and 121 million and 800 thousand pounds, the rest of the costs and expenses.
- Support of passenger transport by LE 1.850 billion, an increase of 89 million pounds from the FY 2017-2018 budget of about 1.761 billion pounds. The subsidy granted to the two passenger transport agencies in Cairo and Alexandria to cover the current deficit side, which resulted from the provision of passenger transport service less than its economic cost.

However, the government's grants are not sufficient to support the Egyptian citizens compared to the new structure of the gas prices which adopted last July, 2018. The new gas structure pushed the Egyptian passenger who can depend on the public transport service to pay an average bus fare between LE 3 and LE 5 pounds. The CTA has approved the following bus fare:

- The bus fare, which runs 30 km and less, reached 3 pounds instead of two and a half pounds

- The bus fare, which runs from 31 km to 40 km, reached 4 pounds. The number of its lines reached 44

- The bus fare which runs from 41 km to 60 km reached 5 pounds and the number of lines reached 27 lines

This structure opens the gate for the Egyptian government to consider the gas prices carefully as it has a direct influence on the bus fare which can add heavy financial burdens on the service users.

5.4 Household spending on Public Transport in Egypt

According to the statistics of the Central Agency for Public Mobilisation and Statistics (CAPMAS) in 2015, the average income for one family in Egypt is estimated with LE 44,200 while they spent an average estimated with LE 36,700 that means every Egyptian household spend 83% of their annual income. In addition, the survey has highlighted the expenditure rate of both urban and rural households. The estimated average of urban residents expenditure was LE 42,400 rather LE 31, 800 in rural areas. These rates indicate the services prices in both urban and rural areas which reflected the living conditions of the Egyptian families.

It is reported that public transport is ranked the third in terms of spending by Egyptian households in 2015 with 6.3 percent after food and beverages with 34.4 percent and health services with 10 percent. On the fifth level of households' expenditures is the education with 4.8 percent and communication with 2.5 percent reached to the entertainment sector with 2.1 percent.

Compared to the survey of the CAMPAS in 2013, the households' expenditure on transport services was 5.2 percent of the annual income with an increase of 1.1

percent in 2015 as a result of many variables on the transport markets especially the gas prices.

5.5 The new model of bus service adopted by CTA

In order to improve the bus service and ease the mobility of the passengers around all the city centers in Greater Cairo, the MOT, CTA and with the cooperation of MT Company have started the first phase of the smart buses to cover two main destinations using the big vehicle from Tahrir to New Cairo and Shoubra El Kheima. The main purpose of this smart service is to provide the passengers with an easy, secured, comfortable and civilized transport service to respond to all the needs of the passengers and at the same time attract the private car owners to depend on this service and reduce terrific pressure in the city center. Furthermore, the new service is considered a response to the changes that applied worldwide to the public transport service to attract more users and decrease the private ownership.

The new smart service has many advantages which can attract many private users to rely on and reduce high load on the Cairo terrific. The advantages include the following aspects:

- All buses are air-conditioned

- Buses operate through one for pick up and the other for departure at the designed points

- Buses are equipped with an electronic payment screen

- Buses are equipped with the technology of Wi-Fi

- Buses are equipped with a screen to display the following tracks and stops;

- Over 50% of the buses are equipped for the passengers with special needs;

- Each bus is internally monitored with surveillance cameras and automatic meter to limit the number of passengers in the vehicle;

- Buses are equipped with a USB port and speakers next to each passenger to hear the ads on the screens without an external sound to avoid disturbing the passengers; and

- Each bus is equipped with a printer and a computer in front of the driver through which the ticket can be issued.

The smart service can provide a convenient mode to many middle-income users compared to other transport modes that lack the spatial coverage of the new service. In addition, the smart facilities during the bus trip can provide a kind of entertainment for the users to reduce both terrific congestion and long trips. The Egyptian government has to do more efforts to implement such models in other Egyptian regions to move forward the using of civilized transport services for increasing the level of passengers' satisfaction.

Chapter 6: Data Analysis and Results

This chapter provides the interpretation of the participants' data collected by the researcher which assist in answering the main research question. This section is divided into two parts. The first one discussed the factors that influence the public bus service based on the perceptions and demands of the passengers. The other part highlighted the influence of the efforts by the Ministry of Transport (MOT) to improve the conditions of the public bus service with a concentration on the passengers' satisfaction with the provided services.

5.1 Factors Affecting the Public Bus Service

Based on the participants' views, the researcher divided the factors that impact on the bus service according to the priorities of the factor to their demands.

5.1.1 Conditions of the Bus Terminal

Waiting Areas

One of the major facilities inside the bus terminal is to find a comfortable place during your waiting time for the bus route. Most of bus terminals in the studied areas (Cairo & Giza) lack comfortable chairs for users during the waiting timing of buses and if founded, they are in a bad condition and most of them are totally broken. As mentioned in the literature review that bus operators should provide protection facilities to the bus passengers during their waiting times at the terminal. One of these protection facilities is the waiting areas that keep the passengers away from climate changes especially the rain and the sun (Nwachukwu, 2014). One of the participants claimed

"I can stay longer on the bus terminal waiting the bus route without finding a place to sit. Most of the waiting areas are out of service and the other places if founded have not been cleaned. There are no any protection types from heavy rains in the winter or the very hot sun in the summer" (A passenger in Boulak El Dakror Bus Terminal, May 2018).

The respondent raised two main issues that influence negatively the quality of the public bus service. The first issue is the absence of the efforts of the bus operators to maintain and upgrade the waiting areas within the bus terminals. The second issue is the important role of designing these waiting areas to be as secure places when sitting on the bus terminal. The design of bus terminal should guarantee an advantage to the passengers to be protected whenever the buses are left.

Availability of Bathrooms

During the waiting times of passengers in the bus terminals, there are many important facilities that can impact on the passengers' satisfaction with the bus service. One of these facilities is the terminal's bathrooms that can serve the users while they are waiting their buses' routes. Nwachukwu (2014) & Eboli and Mazulla (2007) have argued that availability of bus terminal facilities such bathrooms and waiting areas can influence positively the quality of the bus service. However, some of the conducted interviews with bus users have pointed out that there is absence of proper bathrooms during the waiting times of their destinations. One of the passengers stated that:

"There is a complete suffering during my sitting in the terminal to wait for the bus. I cannot find a suitable bathroom to use. All the bathrooms found in any bus terminal in Giza are totally in a messy condition. There is no hired person to follow it

up and prepare for a human usage" (A passenger in Boulak El Dakror Bus Terminal, May 2018).

The participant is suffering from lack of suitable bathrooms in the bus terminal which impact negatively on the service satisfaction. He blamed the terminal operators for not providing more care to such facilities which reduce the quality of the service. Besides, the deterioration of such facilities is related to the lack of workers who can prepare and clean these areas for passengers' usage. Another participant claimed that:

"I have to pay to use the bathroom. I have no problem with this project, but it should be designed to be on the standard as the worldwide terminals do"(A passenger in Lebanon Square Bus Terminal, May 2018).

This participant raised an important issue correlated with paid services in public sites which have to be convenient to satisfy the users. As for this example, the participant has some problems with the standard of the service as he thought that why he should pay for a service without assuring its quality compared to what happens worldwide.

Cleanliness of the terminal

Another important factor influences the quality of the bus service is the cleanliness of the bus terminal. It is essential to offer healthy and clean places for passengers to use the bus service. However, many of places designed to be a bus terminal suffer from lack of cleanliness and healthy environment for the users. As Androniceanu (2016) highlighted the role of design efficient bus terminals to attract users and these locations should provide a comfortable environment to the passengers. Most of bus terminals in Greater Cairo suffer from lack of cleanliness activities

during the operational hours and absence of workers who are responsible for keeping the terminal tidy and clean. One of the participants commented that:

"There are no workers to clean the terminal. The image is so negative and the passengers sit around an amount of garbage waiting their buses" (A passenger in Boulak El Dakror Bus Terminal, June 2018).

This user pointed that limited cleaning services in the terminal can lead to dissatisfy users and the major problem is the lack of the cleanliness workers who can take care of the terminal.

Another participant mentioned that:

"The crisis is associated with the absence of private companies to take a role in cleaning the terminal" (A passenger in Lebanon Square Bus Terminal, June 2018).

The user raised the issue of depending on the private companies rather than the public ones to take a role in cleaning the terminal. Compared to the public companies, the private one can provide quality work during the terminal operational hours as the participant think. Public companies lack the perspective of monitoring and evaluation in which workers can stay long times without following up. While private one has a systematic approach to work and to reach effective results. On this basis, the cleanliness in the bus terminals should be administered through private companies rather than the public ones which lack workers who able to do better work.

Lighting in the evenings

During operational hours at night, lighting in bus terminal can cause many problems to the passengers such as feeling insecure while waiting for the buses and difficulty for some people to see the number of buses especially in the evening's operations. Govender (2014) argued that services in the evenings are essential to provide qualified bus service and to enable people with low insight to use the service.

Two of the participants in the study assured the importance of lighting in the evenings when they said that:

"Most of the lamps are off during the operational hours at night. We have difficulty to read the numbers of buses. Because of lack of lighting, you can feel insecure and you can be stolen at any moment" (Two passengers in Lebanon Square Bus Terminal, June 2018).

The users have refereed to strong correlation between lack of lighting in terminals during the operational hours at night and the chances to be unsafe and threatened to be stolen. This relation can influence negatively the rate of users at night in which passengers can try other transport services.

Security procedures

During the operational hours of the bus terminal especially in the evening's schedule, there is a demand of the bus passengers to feel secure from unexpected incidents such assault or pick pocked through suspicious persons. On this basis, security procedures in the bus terminal are an essential policy to deal with emergency situations and to keep the enforcement of the law in such public locations. However, there is a total absence of any kind of security in bus terminals and there were many incidents that happened to the users during the operational hours as one of the participants reported the following:

"There are many illegal vendors at the terminal who threatened the passengers' safety without intervention from the state authority. They always made terrible incidents to the passengers either in the terminal or during the journey. There is no any kind of security and if something bad happens, they come late" (A passenger in Lebanon Square Bus Terminal, June 2018).

The passenger raised a serious issue during the working hours of the terminal in which lack of security procedures can create the phenomena of illegal vendors who can cause many problems to the passengers. Besides, there is a mandatory of establish a police center near the terminal to be quickly responding in case of emergencies. While another passenger pointed that:

"I lost my wallet many times during the waiting times in the terminal. The bus terminal is full of suspicious persons who have unfortunately increased" (A passenger in Abdel Moniem Ryaid Bus Terminal, June 2018).

The passenger reported his negative experience with the issue of terminal security and to what extent the absence of security procedures can threaten the lives of the bus users.

5.1.2 In Journey factors

During the journey, passengers are keen on finding appropriate level of service through a set of measurements including cleanliness of the vehicle, safety procedures in pickup and drop off points, drivers' behavior, comfortable seats, route mapping information and lighting during night trips. These factors play a dynamic role in assessing the quality of the bus service. As Aidoo, Agyemong, Monkah&Afukaar (2013) highlighted that cleanliness, seats, safety in drop off and pick up points and drivers' attitudes are the most important factors that influence the bus users in a journey. Through the next few pages, the researcher will analyze separately each factor and how passengers perceive this in the quality structure of the bus service.

Comfortable Seats in the Bus

The design of the vehicle is important to guarantee some advantages for bus users. One of these advantages is the comfortable seats during the bus trips. Most of the buses run by the Cairo Transportation Authority (CTA) are lack of the advantage

of comfortable seats in which the space between the bus seats is very narrowed which cause uncomfortable sitting for the passengers especially during the long trip. One of the study's participants commented that:

"During the trip, you can feel a lot of pain in your legs due to the uncomfortable seats. There is not any kind of maintenance to the bus seats which some of them transferred to be a wooden one" (A passenger in Abdel Moniem Reyad Bus Terminal, June 2018).

The passenger is not satisfied with the status of the bus seats which reached a worse case because of the lack of maintenance. He referred to the importance of offering comfortable seats during bus trips in order to reduce harmful effects on passengers' health. Another bus user commented that:

"Many buses in the service are old and lack basic demands of users" (A passenger in Boulak El Dakror Bus Terminal, June 2018).

It is another concern raised by this passenger who related the deterioration of bus seats to the absence of replacing old buses with new ones. Upgrading the old buses with the criteria of comfortable seats can impact positively on the users and reduce the uncomfortable sitting during the long trips.

Safety procedures (Drop off & Pick up Doors)

As there is a must to secure the passengers during their waiting times in the bus terminal, there is, also a necessity to implement safety procedures during the passengers' trips. One of these procedures is using bus doors in drop off and picks up in the designated routes points. This arrangement can reduce the negative incidents to the passengers and drawing the culture of respecting the purpose of using the vehicle doors. Govender (2014) highlighted in his study the negative consequence on passengers' safety if there is an absence of respecting both the vehicle's doors in drop

off and pick up points in the different bus stops. He related the main causes of this phenomenon to both the drivers' attitude and passengers' culture. One of the research's participants commented that:

"During the trip, the responsibility of using the doors wrongly is common between the bus driver and the passengers. Everyone has his/her own mentality to use the doors according to his/her own culture" (A passenger in Lebenon Square Bus Terminal, May 2018).

The user assured that the problem of using the vehicle's doors in a wrong way during the trip is a shared responsibility between the driver and the passengers. He gives a root cause to this phenomenon that is reflected in the way of passengers' culture to refuse any kind of rules during the usage of public services. As a result, the safety of buses is not a single responsibility of the driver, but it can include the passengers as the participant thinks.

Cleanliness of the vehicle

Before using the vehicle in a route trip, it should be attractive to the passengers who will stay for a specific time to go to their work or other different activities. A clean and tidy vehicle can represent high rate of satisfaction for the users. This is reflected positively in assessing the quality of the bus service. Friman, Edvardsson and Garling (2001) and Eboli and Mazulla (2007) reported that cleanliness during the journey is a major factor of effective public transportation services. However, many interviewers commented on negative incidents related to the bad standard of cleanliness before the bus departure. One of them reported that:

"The buses are not clean. It is total mess inside the vehicle. The bus can operate the whole day without collecting the garbage and prepared for other trips" (A passenger in Boulak El Dakror Bus Terminal, May 2018).

The passenger raised two main concerns in his comment. The first issue is the bad condition of the vehicles and how this can be reflected on the passengers who are supposed to take an appropriate level of service. The other concern is the carelessness of the terminal operators to prepare the buses for different route trips which create negative images of the buses during their journey. Another user stated that:

"You have to clean the chair before sitting on. Inside the bus, there are dirty images that reduce the efficiency of this service. There is not any kind of monitoring after the vehicle is back to the terminal" (A passenger in Abdel Moniem Reiad Bus Terminal, June 2018).

This user continues in providing the examples of unclean vehicles especially the status of seats which have to be tidy for the passengers' usage. In addition, he correlates the deterioration of vehicles' cleanliness with the absence of the monitoring inside the bus terminal. Based on this, terminal operators have to check the vehicles before other trips to make sure that these vehicles have some standards of tidiness.

Route's Information during the Trip

It is important for the bus service operators to deliver accurate information about the route number and route destination with expected bus stops during the bus journey. Most of the buses run in Metropolitan Cairo lack this demand in which passengers sit during the whole journey without being aware of the route points and some passengers can loss their destinations as a result of that. As some of the participants in the study mentioned that:

"Most of the buses lack digital screens to present information about the route either the stops or the final destination. One day, I got lost as I took a wrong bus which has information related to another route's number" (A passenger in Abdel Moniem Reyad Bus Terminal, June 2018).

This participant reported that the lack of information during the bus trip is associated with the absence of the digital screen in some buses. As a result of this, passengers can face the chances to get lost during their trips as he mentioned his own experience during one of his trips. On this basis, information during the bus journey has a positive impact on passengers as it guides them and allows each user to reach his/her bus stop easily. Another user commented that:

"Information during the bus journey should take into consideration the right of blind people" (Ali, A passenger in Abdel Moniem Reiad Bus Terminal, June 2018).

The participant assures that all citizens have the right to use the public transportation, but with different needs according to the human beings. He used the example of blind people to obligate the service operators to design the service and matched with disability users whether blind or deaf.

Drivers' behavior

The employee attitude is an essential part in the success of any organization either public or private. The attitude of employees can attract many users to try the service many times regularly and in the contrary, this can decrease the trust of the clients to the ability of such organization to provide quality service. In the transport area, drivers formulate the core feature of the provided service as they regularly interact with passengers during different trips all the work days. Tizando, Galilea, Delgado and Niehaus (2014) assured that better transportation services can be achieved through qualified drivers and they should receive compensation for their great performance.

In many cases, drivers achieve appropriate level of work, but their behavior is still an issue of debate which is reflected negatively in the quality of transportation services. One of the participants' reported that:

"In fact, the behavior of most of the bus drivers is bad towards the passengers. They always use loud voice when speaking to the passengers and they do not respect the passengers at all. They don't listen to reduce the speed which put the life of users in danger" (A passenger in Lebenon Square Bus Terminal, June 2018).

The user mentioned some negative attitude that influences negatively the relation between the driver and the passengers. Speaking loudly, driving fast and impolite is the main concern that can decrease the trust between the passenger and the service provider and can be reflected on the way passengers behave. Another participant linked the bad behavior of drivers and lack of training designed for them when he pointed that:

"There is no any type of training for those drivers to guide them how to interact with people" (A passenger in Boulak El Dakror Bus Terminal, June 2018).

This user thinks that the solution of such bad behavior can be found on training schemes designed by the service operators that improve the interaction of the users during the different trips.

5.1.3 Service Affordability

Financial capacity is an important engine to pay for services either public or private in which its suitability can differ in other activities. Monthly, people calculate the percentage of their budget for the public transport services in which high fare prices can decrease the opportunities to apply for other activities or have a decent life. Based on that, affordability of public transportation service is an essential need for

citizens in order to make a balance with other life purposes and to make a regular access to such services. On the following lines, the researcher will introduce how the fare prices associated with public bus service influence the passengers' satisfaction and to what extent changes in fares affect their decisions to rely on the bus service regularly.

Bus Fare

Passengers searching for an economical transport services with limited financial burdens can influence other life activities either the medical care or education. In spite of this, many countries worldwide, the bus fares an essential revenues to the national income and participate effectively in the development schemes to different fields. The increase in its value should decrease any financial burdens on the users (Paulley, et al., 2005).

Most of the participants in the study had different feedbacks on the issue of bus fares. Some of them are satisfied with the fare compared to other transport services such taxi, microbuses and the underground. At the same time, the others are not satisfied and think that the service needs to be upgraded as a compensation of paying such fare. One of the passengers in Boulak el Dakror Bus Terminal commented that:

"I am work in Sheikh Zayed city in a metal factory and invest approximately E.G.P 200 monthly as public bus fare. It is an appropriate deduction to my monthly salary. Other transport services can add heavy burdens to my financial capacity "(June 2018).

The user makes some important correlations between affordability of the fare prices for public bus service and the monthly salary that has different purposes and activities to be covered as he explained. The appropriateness of bus service fare enables users to pay for other essential services and to access to both work and

education effectively. As Gunaruwan & Harshanee (2015) confirmed that affordable transport services guarantee permanent access to work and education and increase the movement of citizens in different state services.

At the same time, a passenger in Boulak Al Dakror Bus Terminal, pointed that:

"In today's high prices that we witness, it is an appropriate fare compared to other transportation types such taxis or microbuses. The challenge to make it constant is compared to the bad financial conditions of users" (June 2018).

This participant raised a state responsibility towards those who have financial burdens and search for transport services with affordable prices to allow them use the service with stable value. Based on this, the state should make a balance between fare increases in any transport types with the users' income. So the equation can lead to a better relation between users and service providers.

5.1.4 Service Reliability

Reliability in public bus service is an essential factor to most of the users as it increases the trust in the service providers and passengers' satisfaction with the service. The time table in terminals and bus stops influence the quality of the bus service because both demands regulate the relation between the passengers and the service. Lack of service reliability can increase the quality gab between expected service and desired one by the users. Eboli and Mazulla (2007) reported negative incidents of using public bus service in Italy due to lack of service reliability the same as what happened in Porto when Berio (2007) investigated the impact of time table on passengers' day activities and concluded that the lack of time table can waste passengers time.

Time table information

The analysis of participants' feedbacks concerning the service reliability has shown that there is totally absence of time table information in terminals and the only guidance is the route destination without including stops or arrival timing. One of the users commented that:

"In the bus terminal, you cannot find a route schedule to present any available data about stops, arrival time or departure time of trips. It is a kind of mess while waiting for the journeys" (A passenger in Lebenon Square Bus Terminal, June 2018).

The user raised three weaknesses negatively influence passengers while they are waiting the different route trips. Information before using the service is important to guide the user with the destinations and expected arrival time.So they can do their arrangements based on these data. In addition to what has been mentioned, time table information can decrease high density in buses because there will be extra choices for passengers to take different trips based on operation schedule.

Route Stops

Another factor has an impact on the service reliability which connects passengers with their destinations. Bus stops are an essential need that should be designed effectively to ease the mobility of passengers. One of the passenger included in the study highlighted that:

"I always reach my work late in Nasr City as I have to drop off before the company with a long distance and walk for half an hour. The problem is that the bus operators confirm that the route has a stop in front of the company, but unfortunately this is inaccurate data" (A passenger in Abdel Moniem Reyad Bus Terminal, June 2018).

This user has a negative experience with the public bus service as he always reaches his work late due to unreliable bus stops. He explained that the main cause of this problem is the bus operators who should be aware of all the route stops and should obligate bus drivers to stop on these points either to pick up users or to drop them off. Based on this, designed stops in each bus route can save the users' time and achieve some kind of reliability and service trust.

Another passenger reported that:

"I stayed two hours waiting a bus route from Tahrir to New Cairo, but in vain. I decided to go directly to the bus terminal to take the route and while waiting, I talked with the supervisor who informed me that the bus operators changed the stops of this route due to high density of users. It is a kind of responsibility escape" (A passenger in Abdel Moniem Reyad Bus Terminal, June 2018).

The passenger has a negative incident with the route stops that can influence his work schedule or other daily activities. He thinks that accurate bus stops are an essential need for all users, so they can arrange their activities on a timely basis. He argues the irresponsibility of the bus operators who changed the route map without announcing or replacing the time table of the routes. This action can lead to more dissatisfied users with the route schedules and the absence of reliable service.

5.1.5 Intensity of service

The last factor that has an impact on the bus service quality is the service in different angles such service on weekends, spatial coverage of the routes, number of buses compared to passenger density and operational working hours and service on the evenings to match with the demands of users. These sub-factors are dynamic in assessing the public bus service because they measure the capabilities of the service providers to work in complex environment and to increase the reliance of users on the

bus service. Friman, Edvardsson and Garling (2001) paid more attention to the areas covered and working hours of the public bus service in Sweden when they studied the impact of planning bus service on the passengers' perceptions. They highlighted how citizens in Sweden preferred long operational hours and linking the city centers with other areas rather than other quality factors.

Spatial Coverage

Service coverage is an important demand of users as it connects all the city centers and new established cities with the citizens' activities. Issues such Education, Health and Entertainment cannot be accessed without efficient service coverage. In his investigation in Romania, Androniceanu (2016) reported that most of public transport users search for service coverage to remote destinations for the purpose of working and having entertained moments. Here, the research sample has commented on different experience in this area. One of the participants argued that:

"I am a regular user of the bus service as I work in Sheikh Zaied City ten years ago. The coverage of the bus service to my work location is the main dominant to rely on the service. If there is not this route, I have to take a private transport means to reach there with additional fare" (A passenger in Lebenon Square Bus Terminal, June 2018).

The participant pointed out that the bus service coverage is necessary to connect users with their work locations and improve the mobility of them out of the city centers. Besides, the participant referred to an important benefit for passengers if they use one direct route to their activities; they can save more money. Another service user agrees with Adel who stated that:

"I am working on a site near Cairo Airport. Without the public bus service, I have to pay over EGP 50 to reach there. The bus service fare is only 5 pounds. It is a

completely sharp difference" (A passenger in Boulak El Dakror Bus Terminal, June 2018).

For this user, service coverage is connected with the paid fare on a daily basis. He argues that far destinations can cost higher if there is not effective spatial coverage of the public transport service. Based on this, spatial coverage guarantees easy mobility for all users if taken seriously on the service planning.

Number of Operated Buses per Route

To avoid high passenger density at bus terminal, the number of buses per each route should respond regularly to this purpose. Operations during peak hours require an appropriate number of buses to allow users access to different activities on a daily basis. Nwachukwu (2014) studied the impact of providing enough buses on some routes. He found a decline in passengers' waiting times and flexible operations within the bus terminal.

Participants on this research vary on their opinions regarding the necessity of making balance between the number of buses per route and the density of passengers. Two of the regular users of the bus service mentioned that:

"Large number of passengers can stay long time waiting for the next bus in some routes. There is a lack of the number of buses which cover some major routes especially at peak times that is necessary for users to reach work or other interests" (Passengers in Abdel Moniem Reyiad Bus Terminal, June 018).

Those participants raised a major weakness influence negatively on the quality of the bus service. Long waiting time for the bus service can cause many problems to users either in reaching late for work or other activities. Enough number of buses can reduce high density and bus capacity to operate efficiently can be improved.

Another user stated that:

"There are major routes at the terminal with only three to four buses to work over 12 hours. It is totally complex situation for the operators to face high number of passengers" (A passenger in Boulak El Dakror Bus Terminal, June 2018).

The user was not satisfied with the service because He thought that the low number of buses in some dynamic routes can lead to a negative relation between the service providers and the passengers. He blamed the operators for providing this weak number to carry hundreds of citizens daily which can be reflected on the bus capacity to work efficiently.

Number of Operational Hours

Passengers search for long operational hours in public transportation service which allow regular access during the whole day. Some activities related to work specifically need an extended service in order to ease the movement of the users. Many passengers face complexity to arrange their work hours due to the limited service hours in some bus routes which obligate them to choose alternatives with a high cost. The participants in the study show negative feedbacks to the working hours of the bus service. One of them reported that:

"After 10 p.m., you cannot find the bus service and you have to pay extra fare to reach your home. Only few routes are still operating till 11 p.m., but they cover limited locations rather the out of city center where people mostly work" (A passenger in Boulak El Dakror Bus Terminal, May 2018).

The user raised two important issues; the increase for the necessity of extended working hours in the bus service. The first issue is the extension of the service after 10 p.m. in some important routes connected to remote destinations with the city centers to ease the return

of passengers to their homes. At the same time, the other point is the extra fare that passenger will pay if there is not any bus service extension and this leads to a financial burden on the passengers.

Another user pointed that:

"I work at New Cairo and my working conditions are so complex which obligate me to stay till 12 a.m. There is not any transport service to return home and I put myself under the rescue to wait any other transport service that may be unsecured at this time. I think extended working hours can save many passengers' life" (A passenger in Abdel Moniem Reyad Bus Terminal, June 2016).

The participant connected the safety of passengers with the extension of the service hours in some locations which have unique working conditions. Long working hours of the bus service will permit the passengers to adapt to complex working conditions out of the city centers.

Service on Weekends

Weekend service is an important demand for the passengers to spend different types of activities such as work, entertainment or other personal purposes. Regular service during weekends enriches the level of passengers' satisfaction and reduces the reliance on private ownership for ease mobility. Passengers who were interviewed for this research had different experiences in the topic of the weekend's service. A passenger in Abdel Moniem Reyad Bus Terminal commented that:

"There is a less frequency to the service during the weekends especially in Saturdays which are necessary for those who work six days per week. There are irregular time tables with limited coverage which increase the density of passengers in some routes" (June, 2018).

The user raised a weak point in the bus service during the weekends. Numbers of routes do not compile the needs of passengers, limited service and high density can lead to negative incidents. Moreover, working conditions of many users can change the time table of some routes due to density and stops of the route. On this basis, the operators of the bus service have to adapt the service to respond to different purposes that include work as a major priority.

At the same time, a passenger in Boulak El Dakror Bus Terminal stated that:

"On Fridays, the service is limited and the drivers always depart late. If you have a date, you will reach late and there is totally absence of any monitoring to the buses movement and drivers' timing to leave from the terminal" (May, 2018).

The user continues in showing the weaknesses of the bus service during the weekends. He mentioned the negative experience with the bus drivers who depart late from the terminal without respecting the route time table and the lack of the responsibility of the terminal's operators in managing the service during the weekends.

Additional Service Options

It is essential to add some additional options to the bus service to go behind the expectations of the users. Options such air-condition, Wi-Fi technology and special audio offerings for the disabilities can increase the quality of the bus service and provide the passengers with more facilities to ease their long distances. Using these choices with a reasonable fare can enhance the public transport service and level of users' satisfaction. Some passengers show their resentment with the absence of these additional services during the phases of the study interviews. One of them commented that:

"In the summer, most of the buses have no ventilation system to reduce the high temperature inside the vehicle. During the trip, all passengers suffer from the high temperature and some of them can have many health problems especially breathing difficulties" (A passenger in Abdel Moniem Ryiad Bus Terminal, May 2018).

The participant showed the weaknesses of the ventilation system of the buses and how this can influence negatively the passengers during their trips. With regard to the buses' capacity at some terminals, the ventilation system is a must to reduce the high temperatures especially in the summer. However, most buses lack this option and lead to many negative incidents for the passengers. At the same time, a passenger in Boulak Terminal pointed out that:

> *"To use a comfortable bus service full of extra services such as air-conditioning and other supported services, you have to pay extra service fare that reaches EGP 10. This is unfair for those who have limited budget" (June, 2018).*

This user connected the comfortable service with the fare and this cannot be affordable for those who have a limited income. He raised the issue of offering some important services within buses such the air-conditioning with an affordable fare. So everyone can use the service without obstacles. Replacing the old vehicles with new ones including better ventilation system can improve the environment during the trip and provide the passengers with better conditions to travel for long distances.

5.2 Engaging Passengers in Evaluating the Bus Service

It seems that participation in the bus service evaluation is necessary for the passengers in order to feel that they are a vital part of the service. In addition to this, their opinions and suggestions can find a place in the strategic plan of the service operators. Passengers of the bus service are near to all the weaknesses and strengths of the service. Therefore, they are a dynamic reference to the operators if they plan to change the service to respond to the demands' of the users. Montalvo (2009)

explained the relationship between participation of citizens in assessing the public service and the government performance in some countries in Latin America. He summarized his research in two important recommendations. The first one was the necessity of measuring the opinions of the citizens with the delivered services to identify the degree of satisfaction and gaps of current services. The second point was the positive influence of such as participation in the government performance in the area of public service provision.

On the other hand, Kampen, Van De Walle & Bouckaert (2006) linked the engaging of citizens in evaluating the public services with building a trust relationship with the government. They agreed that listening to users' opinions and demands can enhance the quality of such services because they directly interact with these services rather than the government. So they know what the best is and what the worst of these issues is.

Based on this, participation in assessing the public bus service can both improve the service and build a trustful relationship with the government.

The study of the sample of this research has given different opinions concerning this issue. One of them commented that:

"We are the backbone of the service and know exactly the gaps of the service. Our opinions and suggestions can make the difference and raise our importance as a vital part of the service not the staff who are sitting in offices and have nothing to plan" (A passenger in Boulak El Dakror Bus Terminal, May 2018).

The participant was concerned with the necessity of passengers in assessing the service as they rely on a daily basis. So their opinions can improve the bus service. She was aware of the role of passengers in making different steps in improving the

quality of the bus service rather than those who are away from touching the weaknesses of the service.

While another passenger in Abdel Moniem Reyad Terminal illustrated that:

"The quality unit of the terminal is not working efficiently as they do not investigate the passengers' incidents related to late departure, drivers' attitude, bus stops and other quality issues. They completely waste the time of passengers in listening without responding to their problems" (June, 2018).

The user discussed an important subject related to the absence of the roles of the quality units in the bus terminals which carried negative consequences to the quality of the bus service. Responsiveness is part of involving passengers to evaluate the service as the user will feel that the provided opinion is totally respected and under wither short term consideration, or long one. Therefore, the necessity of establishing the quality units in terminals is part of encouraging people to participate in assessing the appropriate bus service.

5.3 The influence of the new smart service

The new service has witnessed a wide agreement for those passengers who search for a convenient public bus service to regularly depend on. The smart options that are provided have a great impact on users to ease their journey's time. Moreover, it creates a kind of professionalism in managing the public bus service which is still in its recovery stage. Passengers who use this smart service reported different feedbacks which reflected a summary of satisfaction with the bus service.

One of the study participants stated that:

"I work in New Cairo and have not choices to depend on other transport means except the public bus. I was in a struggle to catch a place on the traditional bus service to reach my work. With the advance of the smart service, I always reach the

work on time and enjoyed the smart options provided in the vehicle that reduce the trip stress" (A passenger in Abdel Moniem Reyad Bus Terminal, July 2018).

The passenger has shifted to the smart bus service after his own struggling with the traditional service that lack the new options provided through the new service. He mentioned the timing as an important factor of assessing the service and how the new service provides an ideal solution to his work tardiness. Moreover, the services founded during the trip increase his level of satisfaction especially the stressful mode that can collapse with the advance of the additional services in the vehicle.

Another passenger agrees that the influence of the smart bus service is effective. The passenger highlighted the success factors of the new service as follows:

"It is a successful idea that needs to be expanded to cover many routes in Grater Cairo. The drivers are trained and know exactly how to interact with the passengers, the vehicle is air-conditioned, seats are comfortable, different doors for ascending and descending, Wi-Fi technology to offer access to the internet, and timely service schedule" (A passenger in Abdel Moniem Reyad Bus Terminal, July 2018).

The participant mentioned the advantages of the smart bus service such trained drivers, facilities during the trip, and the advance of bus schedules to organize the timing of departure as a way of providing a quality service. She suggested an expansion of the service to include other regions that suffer from lack of bus services.

The previous success factors mentioned by the participant opened the door for making comparison between the traditional bus service and the smart one and to what extent the new service can replace the old one for the benefit of the users.

Facilities founded in the smart bus service have a dynamic influence on passengers rather than the old one that lacks these basic needs. The smart service can offer ideal

solutions to develop a public bus system in Greater Cairo and attract more users to depend on that can lead to decreasing the pressure on the terrific in Cairo centers. The CTA can expand the service on other areas to replace the old service with a dynamic one that depend one smart solution in the Transportation side.

All the discussed results have opened that gate for the passengers to determine the most critical factors that influence the public bus service on the areas under investigation. There are the first groups who are mostly concentrated on the facilities within the bus terminal that attract the riders and can ease their waiting time before each trip especially the waiting areas and bathrooms. While, the conditions of vehicles are less important for them and cannot influence greatly their level of satisfaction.

In addition to what has been mentioned, the additional service options such as air-condition and WiFi technology can increase their level of retention and their rate of service reliance.

Finally, there was less concentration on both time table and route points because it cannot be solved separately without solving other associated problems such as roads and traffic conditions that influence negatively the trips timing and service schedules. As for most participants, they agreed that the problem has traditional roots that stayed without solutions many years ago. These roots such as the deterioration of the roads networks and absence of improvements to the sector of Transportation lead to lack of different types of Public Transportation.

Chapter 7: Conclusion and Recommendations

For many middle-income households in Egypt, public transport services play a dynamic role on their mobility to different state's services such work, health and education. They always are being in a battle to find a comfortable service responding to their demands and perceptions. The public bus service in Egypt lack many aspects of service quality that reflected on different dissatisfaction incidents among middle-income users. The weaknesses of the bus service are clear to the public officials in Egypt. It includes lack of investment in upgrading most of the buses, lack of infrastructure within many bus terminals, lack of drivers' training, lack of accurate time table , absence of regulations that organize the service and lack of users' participation in assessing the service.

Users of the bus service are vital part to evaluate the service as they directly interact with the service and aware for all its improvements. They represent an effective reference to the service operators to guide them with the gabs of the bus service. So, their demands, opinions and preferences are highly essential to improve the bus service and increase their level of retention and loyalty. Based on the prospective of middle-income households in Greater Cairo, the quality of the bus service can be classified into five main sections include terminals condition, in journey condition, service affordability, service reliability and intensity of the service.

Facilities within bus terminals are important to ease and guide the users before using the service**.** These facilities can be summarized in three main categories; the infrastructure of the terminal such as the waiting areas, bathrooms and safety pavements to secure the users while using the service, the timetable information that organizes the service and guide the passengers with their routes and time of departure

and expected arrival times based on the terrific conditions. Finally, there is the quality unit that is responsible for evaluating the service based on the views of the passengers.

The second section can be found during the trip and has some necessary features to the passengers' satisfaction. The first feature is the conditions of the vehicle before the trip such cleanliness and ventilation system if existing to be working efficiently. The second feature is the behavior of the drivers as they deal directly with the users. So, they should be trained to respect them and do their work in a professional manner. The third feature is the safety of the passengers through appropriate bus speed and using the bus doors in pick up and drops off. The fourth feature is the information that guide the users during the trip such as the different bus stops and expected arrival times. The third section is the bus fare which affects in the montly budget of the users and receives more attention from them. Bus fare is a dynamic role for generating revenues to support the state budget. However, it should not be structured to add heavy financial burdens on middle-income users who already face financial difficulties on other services.

The fourth section of the bus service quality is the engine of reliability which builds a trust relationship between the users and the operators. It has two main roles both to organize the service and to inform users with the designated bus stops. Finally, there are the satisfactory sides of the service which can be found on different areas. The spatial coverage that responds to different destinations that serves the passengers' interests such as work, health and education. In addition, the working hours of the service can influence the mobility of passengers especially those who have unique conditions at their work or other purposes. Moreover, the service on weekends which represents a major concern for many users as the service becomes irregular and there

is not any kind of monitoring. Finally, additional choices of services during the trip such as the air-conditioning or other technological devices can reduce the pressure on the passengers especially in long trips.

From the side of bus operators in Greater Cairo, there were intensive efforts to improve the bus service to reach an appropriate level of satisfaction among many users. One of these efforts was the establishment of the smart bus in Cairo to connect some regions as a pilot project in Egypt. The smart bus has many comfortable facilities to ease the trip of users. Many passengers reported that cleanliness, safety, drivers' behavior, bus fare and internet are the most attractive facilities of the smart bus. It is a hope for most of bus users to expand such ideas on other Egyptian regions to attract private car owners to use the service which will reduce the high load on terrific.

Policy Recommendations

- The state should increase investment in upgrading the buses and the network of roads as many roads in Greater Cairo are deteriorated and insufficient for bus usage
- Cities in Egypt should guarantee for all persons the right to mobility and circulation in the city, in accordance with an urban and interurban circulation plan and through an accessible public transportation system, provided at a reasonable cost and adequate for different environmental and social needs (gender, age, capacity, etc.).
- Cities should stimulate the use of non-polluting vehicles and establish areas reserved for foot traffic, permanently or during certain times of the day.
- Cities should promote removal of architectural barriers, installation of the necessary facilities in the mobility and circulation system, and adaptation of

all public or public-use buildings and work and leisure facilities to guarantee access for persons with disabilities.

- MOT should establish the Quality Assurance Unit (QAU) in each bus terminal with three main functions. The first function is to monitor the operations of all the bus routes to evaluate both efficiency and effectiveness. The second one is to assess the behavior of the drivers as they regularly interact with passengers and their attitudes are a dynamic feature to ensure the quality of the bus service. The third function is to evaluate the passengers' perceptions of the bus service and respond to both inquires and suggestions as a way of passengers' engagement in assessing the service

- The MOT in the cooperation with the professional training institutions should establish training programs to improve the drivers' performance as the most negative incidents are based on the views of passengers involved in this study were the behavior of drivers. The training programs should concentrate on the reactions of drivers and communication with the passengers. Besides, there is a necessity of following the safety procedures during the journey both vehicle speed and pick up and drop off doors
- Improving the facilities within terminals such as the cleanliness through hiring a service provider to be responsible for the cleaning activities either in the terminal or on vehicles before trips. Also, improving the waiting areas to protect passengers from different climate changers either in summer or winter
- Redesign bus terminals to be divided into routes' sections according to spatial coverage of the bus route
- A structured replacing plan by the MOT and the CTA to upgrade the old buses as many negative incidents of the study participants were the status of the vehicles

that were too old to continue in the operations and resist the high capacity each day. Replacement of the old vehicles with new ones should take the following procedures:

1. Years of service operations
2. The spatial coverage of the route
3. The number of users per each trip to decide the expected number of operated buses

- The Ministry of Interior with the cooperation of both MOT and CTA should establish security points near the main bus terminals in Greater Cairo to keep a level of passenger security whenever unexpected incidents happen especially on the evening working hours
- Strict policies to obligate illegal vendors not to use the bus terminals to sell their products as in some cases that they threatened the life of passengers
- Posting awareness advertisements in the vehicles to enlighten the passengers with the necessity of keeping the buses clean and respecting the rules of exit doors and an immediate fine against the violators
- The CTA should use a GPS in buses enable the operators to monitor the vehicle during the journey to reduce unofficial bus stops to improve the service reliability
- The MOT with the operations of the Ministry of Telecommunications should work on piloting a smart application like what is used in other private transport means. This application will work in two different sides. The first direction will guide the passengers with the routes database including the number of routes, departure time, arrival time based on traffic conditions, capacity of the vehicle and bus stops. These pieces of information can reduce

the over capacity of buses as it will regulate the usage of passengers to different routes especially in peak working hours. The other direction can be the smart application that provides the passengers to be involved in evaluating the provided services and can rate different features of the bus service to enable the bus service operators to identify the success indictors of the service. These indicators such as safety, timing, cleanliness, drivers' behavior, service working hours and others can summarize the level of the passenger satisfaction

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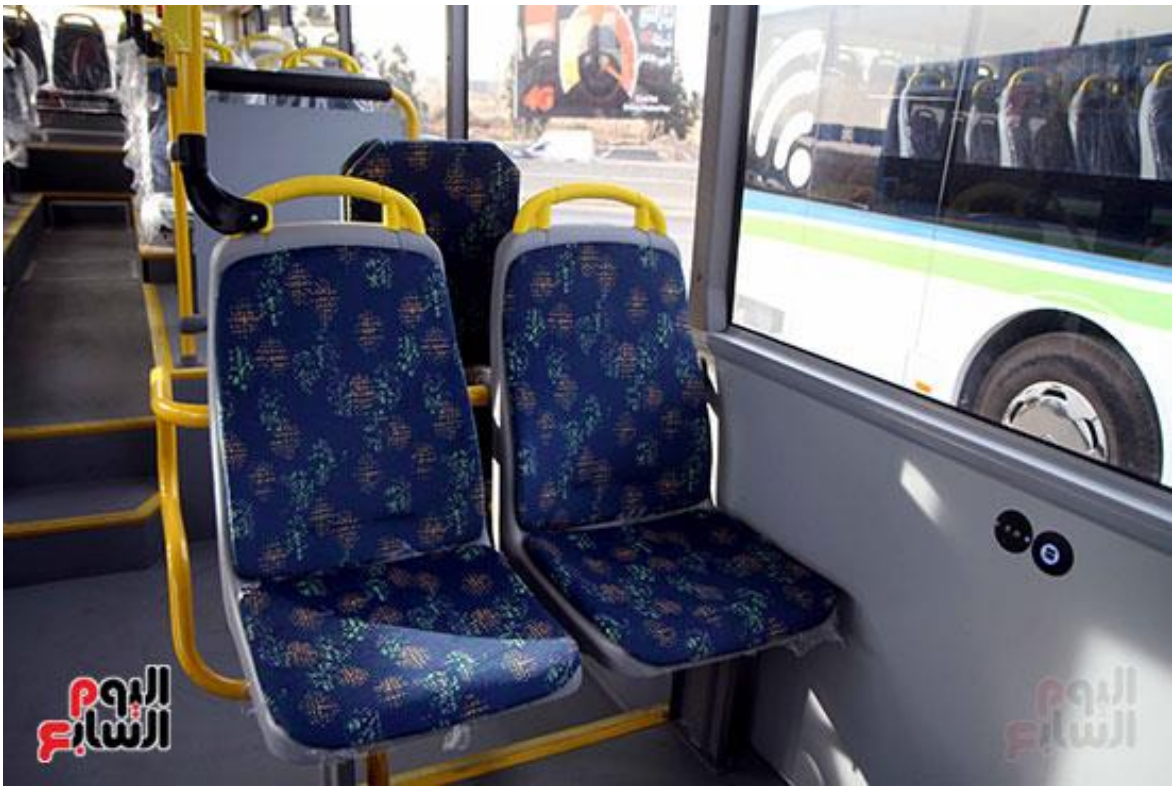
Annex 1: Photos of the new bus service

Source:
https://www.google.com/search?q=el+youm+el+sabee+photos+of+smart+buses&tbm

Source:
https://www.google.com/search?q=el+youm+el+sabee+photos+of+smart+buses&tbm

Source:
https://www.google.com/search?q=el+youm+el+sabee+photos+of+smart+buses&tbm



Source:
https://www.google.com/search?q=el+youm+el+sabee+photos+of+smart+buses&tbm

Annex 2: Interview questions with bus users

1. To what extent you depend on the public bus service in Greater Cairo?
2. What is your level of the monthly income?
3. On the middle-income level, how can the bus service fare influence your monthly budget compared to other life activities such health and education?
4. What is your opinion about the current bus service in Greater Cairo?
5. What are the facilities that are not installed in the bus terminals in Greater Cairo?
6. Do you think that private service provider can offer better solutions to the bus service in Egypt?
7. How can private companies improve the services within bus terminals in Egypt?
8. Do you think that drivers need a training scheme?
9. From your prospective, what are the most important features of "good bus driver"?
10. During the trip, what are the most things you search for?
11. What is the role of timetable in bus terminals and what is the missing part of adapting this plan?
12. Do you think the bus fare is affordable compared to the status of the bus service?
13. How the Egyptian government solve the problem of illegal vendors who threaten the security in bus terminals?
14. Compared to the current service, what are the advantages of the smart bus service adopted by the CTA?
15. Is the bus fare of the smart service affordable for middle-income users?

CASE #2017-2018-145

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

To: Mohamed Aref

Cc: Menna Youssef

From: Atta Gebril, Chair of the IRB

Date: April 21, 2018

Re: Approval of study

This is to inform you that I reviewed your revised research proposal entitled "**Factors that influence on passengers' satisfaction with public bus service**" and determined that it required consultation with the IRB under the "expedited" category. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

Dr. Atta Gebril
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Email: agebril@aucegypt.edu