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**ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

**THE EFFECT OF TRAFFIC SERVICE QUALITY ON CITIZENS
SATISFACTION: THE CASE OF THE TRAFFIC
MANAGEMENT AND CONTROL DEPARTMENT OF ADDIS
ABABA CITY ADMINISTRATION**

**BY:
MAHLET AREGA**

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**Addis Ababa University
School of Commerce
Logistics and Supply Chain Management**

**The Effect of Traffic Service Quality on Citizens Satisfaction: The
Case of the Traffic Management and Control Department of Addis
Ababa City Administration**

**By:
Mahlet Arega**

**Advisor:
Dr. Tariku Jebena**

**A Thesis Submitted to the Graduate School of Addis Ababa University,
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of Art in Logistics and Supply Chain Management Program**

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Addis Ababa, Ethiopia

DECLARATION

I, declare that this thesis entitled: “**The Effect of Traffic Service Quality on Citizens Satisfaction: The Case of the Traffic Management and Control Department of Addis Ababa City Administration**” is my original work. I have undertaken the research work independently with the guidance and support of the research supervisor. This study has not been submitted for any degree or diploma program in this or any other institutions and that all sources of materials used for the thesis has been duly acknowledged.

Name of Student

Signature

Date

CERTIFICATE

This is to certify that the thesis entitled: “**The Effect of Traffic Service Quality on Citizens Satisfaction: The Case of the Traffic Management and Control Department of Addis Ababa City Administration**”, submitted in partial fulfilment of the requirements for the Master of Art in Logistics and Supply Chain Management Program and is a record of original research carried out by Mahlet Arega, under my supervision, and no part of the thesis has been submitted for any other degree or diploma. The assistance and help received during the course of this investigation have been duly acknowledged. Therefore, I recommend it to be accepted as fulfilling the thesis requirements.

Name of Advisor

Signature

Date

CERTIFICATE OF APPROVAL

This is to certify that the thesis prepared by Mahlet Arega, entitled “**The Effect of Traffic Service Quality on Citizens Satisfaction: The Case of the Traffic Management and Control Department of Addis Ababa City Administration**” and submitted in partial fulfilment of the requirements for the Master of Art in Logistics and Supply Chain Management Program complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signature of Board of Examiner`s:

External examiner	Signature	Date
Internal examiner	Signature	Date
Dean, SGS	Signature	Date

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ACRONYMS

ANOVA	Analysis of Variance
CS	Citizen Satisfaction
FDRE	Federal Democratic Republic of Ethiopia
IT	Information Technology
ITC	Information Communication Technology
OLS	Ordinary Least Square
SPSS	Statistical Package for the Social Sciences
TSQM	Traffic Service Quality Model
US	United States
VIF	Variance Inflation Factor

ABSTRACT

This study investigates the relationship between traffic service quality and citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. Using a conceptual framework based on the Traffic Service Quality Model, six dimensions of service quality were examined: accessibility, efficiency, safety, fairness in enforcement, communication, and professionalism of traffic personnel. Data from 294 respondents were analyzed using descriptive statistics, correlation analysis, and multiple linear regression. Results indicate generally below-average perceptions of service quality and satisfaction. Correlation analysis reveals significant positive relationships between traffic service quality dimensions and citizen satisfaction. Multiple linear regression shows that approximately 76.9% of satisfaction variability can be explained by the six service quality dimensions. In terms of individual effect, all independent variables that are considered in this study are significant in predicting the citizens satisfaction in Traffic Management and Control Department of the Addis Ababa City Administration. These findings underscore the importance of targeted interventions and comprehensive reforms within the Traffic Management and Control Department to address identified deficiencies and enhance citizen satisfaction with traffic services in Addis Ababa. Recommendations for enhancing each dimension are provided. The study provides various recommend to address specific aspects of traffic service quality and contribute to overall improvements in citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration.

Key Words: *Traffic Service quality, Citizen satisfaction, Traffic management, Addis Ababa City Administration*

CHAPTER ONE

INTRODUCTION

This chapter presents introductory part of the entire study. It provides some insights about the ground and assumptions where the study is conducted. It states background of the study, statement of the problem, basic research questions, objectives of the study, hypothesis of the study, significance of the study, scope of the study, definition of key terms, and organizations of the thesis.

1.1. Background of the Study

Effective traffic management and control are crucial for urban environments to ensure smooth transportation, reduce congestion, and enhance safety. Well-organized traffic systems contribute significantly to the economic development and quality of life in cities by facilitating the efficient movement of goods and people. According to Litman (2013), effective traffic management minimizes travel time, decreases fuel consumption, and reduces environmental pollution. Moreover, it mitigates the risk of accidents and improves the overall safety of road users (Gwilliam, 2003).

Citizen satisfaction with public services is a vital indicator of the effectiveness and quality of these services. It reflects how well public institutions meet the needs and expectations of the populace. High levels of citizen satisfaction are associated with greater public trust in government and enhanced civic engagement (Van de Walle & Van Ryzin, 2011). In the context of traffic management, satisfied citizens are likely to comply more readily with traffic regulations, thus contributing to the overall efficacy of traffic control measures (Wang, 2014).

The traffic service plays a pivotal role in maintaining order and safety on the roads. Their responsibilities include enforcing traffic laws, managing traffic flow, and responding to accidents and emergencies. The quality of Traffic Services can be evaluated through various dimensions, including reliability, responsiveness, assurance, empathy, and tangibles (Jain, Gupta & Vyas, 2021). These dimensions help in assessing how well the traffic service meet the expectations of the citizens and how effectively they contribute to traffic management.

There is a significant relationship between the quality of Traffic Services and citizen satisfaction. High-quality services, characterized by promptness, efficiency, and professionalism, lead to higher levels of citizen satisfaction (Jain, 2010). Conversely, poor service quality can result in dissatisfaction, mistrust, and non-compliance with traffic laws. Research has shown that when traffic department provide services that citizens perceive as fair, efficient, and respectful, it positively influences their satisfaction levels (Al-Maamari, 2014).

Addis Ababa, the capital city of Ethiopia, faces significant traffic congestion and related challenges. Rapid urbanization, population growth, and an increase in the number of vehicles have exacerbated traffic issues in the city. These conditions result in prolonged travel times, increased pollution, and higher accident rates (Alemu, 2017). The Traffic Management and Control Department of Addis Ababa City Administration is tasked with addressing these challenges through various traffic management strategies and enforcement measures. The Traffic Management and Control Department of Addis Ababa City Administration is responsible for overseeing traffic regulations, managing road networks, and ensuring road safety. The department employs traffic police to enforce laws, manage traffic flows, and respond to incidents. It also implements traffic control technologies and infrastructure improvements to enhance the efficiency of the city's transportation system (Addis Ababa City Administration, 2020).

The objective of this study is to investigate the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration. Understanding this relationship is significant for several reasons. Firstly, it provides insights into areas where Traffic Services can be improved to enhance citizen satisfaction. Secondly, it informs policy makers and public administrators about the importance of investing in quality traffic management services. Lastly, the study contributes to the broader body of knowledge on public service quality and citizen satisfaction, offering practical recommendations for other urban areas facing similar traffic challenges.

1.2. Statement of the Problem

In urban areas worldwide, effective traffic management and control are critical for ensuring smooth mobility, reducing traffic congestion, and enhancing road safety (Jain et al., 2021). Addis Ababa, the capital city of Ethiopia, is no exception. With rapid urbanization and population

growth, the city faces significant traffic-related challenges. The Traffic Management and Control Department of the Addis Ababa City Administration is tasked with addressing these issues by implementing traffic regulations, managing traffic flow, and ensuring road safety (Mekonnen, 2019).

Citizen satisfaction with public services is a crucial indicator of the effectiveness and quality of these services (Parasuraman et al., 1988). In the context of traffic management, citizen satisfaction significantly influences public perception and cooperation, which are essential for the successful implementation of traffic policies (Oliver, 2010). Despite the critical role of Traffic Services, there has been limited research on the impact of service quality on citizen satisfaction within the realm of traffic management in Addis Ababa. Existing studies have been limited in scope and have not adequately addressed how different service quality dimensions—such as reliability, responsiveness, assurance, empathy, and tangibles—affect citizen satisfaction specifically within the context of traffic management (Alemu & Worku, 2022). Furthermore, much of the existing research has been conducted in developed countries or other urban contexts with different socio-economic conditions, highlighting the need for context-specific analysis that addresses the unique challenges and characteristics of Addis Ababa (Jain, 2010; Wang, 2014). Understanding this relationship is vital for identifying areas for improvement and enhancing overall service delivery (Alemu & Worku, 2022).

Furthermore, the Traffic Management and Control Department faces numerous challenges, including inadequate infrastructure, limited resources, and increasing traffic volumes. These challenges can hinder the ability of traffic police to provide high-quality services, potentially leading to dissatisfaction among citizens (Gebre-Egziabher, 2020). The quality of Traffic Services in Addis Ababa has been perceived as inadequate by many citizens, contributing to low levels of satisfaction (Mekonnen, 2019). Issues such as inefficiency, lack of responsiveness, and unprofessional behavior are commonly cited, necessitating a detailed examination of the specific dimensions of service quality that need improvement. Additionally, despite the efforts of the Traffic Management and Control Department, Addis Ababa continues to struggle with severe traffic congestion, leading to long travel times, increased pollution, and a high incidence of traffic accidents (Alemu & Worku, 2022;). Understanding how Traffic Service quality can mitigate these

issues is crucial for effective traffic management (Alemu, 2017; Addis Ababa City Administration, 2020).

This study seeks to fill the gap in the literature by examining the effect of Traffic Service quality on citizen satisfaction in Addis Ababa. By assessing the current state of Traffic Services and identifying key factors influencing citizen satisfaction, the study aims to provide actionable insights for policymakers and practitioners. The findings can help in formulating strategies to improve service delivery, enhance public trust, and ultimately contribute to more efficient traffic management in the city.

1.3. Research Questions

On the basis of the problem, the study was framed to answer the following research questions:

- 1) What are the perceptions of citizens towards traffic service quality in Addis Ababa?
- 2) How satisfied are citizens with traffic services in Addis Ababa?
- 3) What is the relationship among different dimensions of traffic service quality and citizen satisfaction?
- 4) What are the effects of various traffic service quality dimensions on citizen satisfaction in Addis Ababa?

1.4. Objectives of study

1.4.1 General objective

The general objective of this study is to investigate the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration.

1.4.2 Specific objectives

The specific objectives of this study are: -

- 1) To examine the perception of citizens towards traffic service quality in Addis Ababa.
- 2) To analysis of citizens satisfaction with traffic services in Addis Ababa.
- 3) To analyze the relationship among traffic service quality dimensions and citizen satisfaction.
- 4) To examine the effects various traffic service quality dimensions on citizen satisfaction.

1.5. Research Hypotheses

Based on the review of empirical literature and conceptual models, the study empirically tested the following hypotheses.

- 1) **Hypothesis 1:** Improved accessibility of traffic services leads to higher levels of citizen satisfaction.
- 2) **Hypothesis 2:** Greater efficiency in traffic management processes results in increased citizen satisfaction.
- 3) **Hypothesis 3:** Implementation of safety measures positively correlates with higher levels of citizen satisfaction.
- 4) **Hypothesis 4:** Enhanced communication strategies are associated with higher citizen satisfaction levels.
- 5) **Hypothesis 5:** Higher levels of professionalism among traffic personnel positively influence citizen satisfaction.
- 6) **Hypothesis 6:** Fairness in traffic enforcement actions positively influences citizen satisfaction.

1.6. Significance of Study

This study is significant for several reasons, both in the context of academic research and practical policy implementation within Addis Ababa. Firstly, by identifying the specific dimensions of Traffic Service quality that most significantly affect citizen satisfaction, the study provides valuable insights for improving the delivery of public services. Understanding the areas that require the most attention, such as accessibility, efficiency, safety, communication, and professionalism of traffic personnel, enables the Traffic Management and Control Department to allocate resources more effectively and implement targeted improvements. Secondly, the study provides context-specific recommendations that consider the unique socio-economic and infrastructural conditions of Addis Ababa. This localized approach ensures that the proposed solutions are practical and feasible, addressing the city's particular challenges more effectively than generic solutions. Thirdly, policymakers and public administrators can use the study's findings to inform policy formulation and implementation. The empirical data on citizen satisfaction with Traffic Services will help in crafting policies that are aligned with public expectations and needs, thus improving governance and public service outcomes. Lastly, the study

contributes to the broader body of knowledge on public service quality and citizen satisfaction, particularly in the context of traffic management in developing cities. It fills existing research gaps by providing empirical data and context-specific analysis, which can serve as a reference for future studies in similar urban environments.

1.7. Scope of the Study

The scope of this study is focused on assessing various dimensions and aspects of Traffic Service quality and their influence on citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. Specifically, the study delves into the geographical confines of Addis Ababa, considering its status as the capital city of Ethiopia and the unique traffic challenges it faces. It evaluates six key dimensions of service quality, namely accessibility, efficiency, safety, fairness in traffic enforcement actions, communication and professionalism of traffic personnel, as outlined by The Traffic Service Quality Model (TSQM). The model is relevant as it provides a comprehensive framework for assessing the quality of traffic services, encompassing multiple dimensions including accessibility, efficiency, safety, fairness in traffic enforcement actions and professionalism of traffic personnel, that influence user satisfaction and overall effectiveness of traffic management. Each dimension is thoroughly examined to understand its specific impact on citizen satisfaction.

Methodologically, this study adopts an explanatory or causal research design, relying solely on a quantitative approach. The study utilizes a cross-sectional approach within a specific time frame, gathering data at a single point in time rather than through frequent observations. Data collection was conducted using a structured questionnaire administered to current citizens of Addis Ababa. This method allows for the systematic gathering of information on various dimensions of Traffic Service quality and their impact on citizen satisfaction. The quantitative nature of the study enables the analysis of numerical data to identify correlations and causal relationships between service quality dimensions and citizen satisfaction levels.

1.8. Definition of Key Terms

→ **Citizen** refers to individuals who reside in Addis Ababa, the capital city of Ethiopia, and are actively involved in traffic activities within the city. These individuals may include residents,

commuters, pedestrians, drivers, passengers, and any other stakeholders who interact with Traffic Services while navigating the urban environment.

- ➔ **Citizen Satisfaction:** Denotes the level of contentment or fulfillment experienced by citizens with regard to the services provided by traffic department. It encompasses perceptions, attitudes, and feelings of citizens towards the quality, efficiency, and fairness of Traffic Services, as well as their overall experience and interaction with traffic services personnel.
- ➔ **Traffic Service Quality:** Refers to the standard and effectiveness of services provided by traffic officers in managing and controlling traffic flow, ensuring road safety, and enforcing traffic regulations. This includes aspects such as reliability, responsiveness, assurance, empathy, and tangibles, as perceived by citizens interacting with traffic personnel.

1.9. Organization of the Study

The general structure of the paper consists of five chapters. The first chapter deals with background of the study, statement of the problem, research questions, objective of the study, hypothesis, significance of the study, and scope of the study. The second chapter presents review of related literature which is systematically organized from different books and related materials. The third chapter consists of the research methods and procedure employed to collect and analyze the data for the study. The fourth chapter includes the findings of the study, data analysis, discussion and interpretation. Finally, the researcher deals with the summary of the findings, conclusion and makes relevant recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter provides review of relevant literature from different publications of scholars and documents that are related to the study. The chapter is divided in to three sub categories. The first part of the chapter presents the theoretical literature concept and definitions that are related to the study variables which were considered in order to lay solid foundation for the research. The second part presents the empirical studies related to the study topic areas in different countries and the third part presents conceptual framework of the study.

2.1 Review of Theoretical Literatures

2.1.1. The Concept Service Quality

For a long time, quality has been an essential and powerful engine that helps organizations navigate an increasingly competitive market. Service quality determines how well the service meets the requirements and, therefore, shapes the expectations of customers. Quality can be created by an organization constantly looking for new and improved ways to improve the quality of their service and product.

Service quality is composed of the two-term service and quality. In the above section service is defined, now looks brief definition of the concept quality then will define the concept service quality. Quality can also be defined as the totality of features and characteristics of a product or services that bear on its ability to satisfy stated or implied needs (Kotler et al., 2002). It is evident that quality is also related to the value of an offer, which could evoke satisfaction or dissatisfaction on the part of the user.

Service quality can be defined as the difference between customer's expectations of service performance prior to the service encounter and their perceptions of the service received. Gefan (2002) "defined Service quality as the subjective comparison that customers make between the quality of the service that they want to receive and what they actually get.

Service quality also defined as the degree of discrepancy between customer normative expectations for service and their perceptions of service performance. Service quality can be

defined as meeting the needs and expectations of the customer (Kotler, and Armstrong, 2010). The definition of service quality can be extended to the overall evaluation of a specific service with ten service quality dimensions: tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communication and understanding/knowing the customer (Lassar & Winsor, 2000).

Quality service has a positive effect on the bottom-line performance of a firm and thereby on the competitive advantages that could be gained from an improvement in the quality of the service offered so that the perceived service exceeds the service level desired by customers (Ladhari, 2008). Nowadays, with increased competition, service quality has become a popular area of academic investigation and has been recognized as a key factor in keeping the competitive advantage and sustaining satisfying relationships with customers (Zeithmal et al., 2000)

Service quality is considered an important tool for a firm's struggle to differentiate itself from its Competitors (Ladhari, 2008). Service quality has received a great deal of attention from both academicians and practitioners (Negi, 2009). British Journal of Marketing Studies Published by European Centre for Research Training and Development UK (2008) pointed out that, by defining service quality, companies will be able to deliver services with higher quality level. Akroush (2008) also pointed out that service quality is the result of the comparison made by customers about what they feel service firms should offer, and perceptions of the performance of firms providing the services. Gronroos (2007) also defined service quality as the outcome of the comparison that consumers make between their expectations and perceptions.

2.1.2. Traffic Service Quality

Traffic service quality encompasses various dimensions that collectively contribute to the overall satisfaction and effectiveness of traffic management services provided by transportation authorities or agencies to road users (Zhou, et al. 2017; Han, et al. 2019; Liu, et al. 2020; Brown & Chin, 2020). These dimensions include accessibility, efficiency, safety measures, fairness in enforcement actions, communication, and professionalism of traffic personnel.

Accessibility, efficiency, safety measures, fairness in enforcement actions, communication, and professionalism of traffic personnel collectively define the quality of traffic services provided by transportation authorities. Accessibility ensures easy access to information, facilities, and

assistance, while efficiency focuses on the effectiveness and timeliness of traffic management operations. Safety measures aim to protect road users from accidents, while fairness ensures equitable treatment in enforcement actions. Effective communication facilitates information exchange between authorities and road users, and professionalism of personnel enhances user perceptions and interactions. Together, these dimensions contribute to the overall satisfaction and effectiveness of traffic service delivery, promoting safer and more efficient transportation systems.

In summary, traffic service quality reflects the extent to which transportation authorities' meet the needs and expectations of road users in managing traffic flow, ensuring safety, and providing assistance and information (Han, et al. 2019; Liu, et al. 2020; Brown & Chin, 2020)). By prioritizing these dimensions and continuously improving service delivery, transportation agencies can enhance user satisfaction, promote compliance with traffic regulations, and contribute to safer and more efficient transportation systems.

2.1.3. The Traffic Service Quality Model (TSQM)

The Traffic Service Quality Model (TSQM) provides a comprehensive framework for assessing the quality of traffic services, encompassing multiple dimensions including accessibility, efficiency, safety, fairness in traffic enforcement actions and professionalism of traffic personnel, that influence user satisfaction and overall effectiveness of traffic management (Zhou, et al. 2017; Han, et al. 2019; Liu, et al. 2020; Brown & Chin, 2020).

2.1.3.1. Accessibility

Accessibility in traffic services refers to the ease with which users can access information, facilities, and assistance provided by transportation authorities or agencies. It encompasses factors such as the availability of information on traffic regulations, the proximity of service centers, and the convenience of communication channels for inquiries and feedback.

Accessibility, a key component of the TSQM, has been highlighted in previous studies as a crucial factor influencing user perceptions of traffic services. According to Dissanayake and Jayatilleke (2017), accessibility to traffic information and services significantly impacts user satisfaction and behavior, with convenient access to information and service centers positively associated with higher satisfaction levels. Similarly, studies by Zhang et al. (2019) emphasize the importance of accessibility in promoting user engagement and compliance with traffic regulations, highlighting

the need for transportation authorities to prioritize initiatives that enhance accessibility and convenience for users.

2.1.3.2. Efficiency

Efficiency, another dimension of the TSQM, has been extensively studied in the context of traffic management processes and their impact on user satisfaction. Efficiency in traffic management processes refers to the effectiveness and timeliness with which traffic authorities or agencies handle various aspects of traffic flow, incident management, and enforcement actions. It encompasses measures taken to optimize traffic operations, minimize delays, and ensure the smooth flow of vehicles and pedestrians on roadways. Research on efficiency in traffic management processes has highlighted its importance in improving road safety, reducing congestion, and enhancing overall user satisfaction with transportation systems.

According to Li et al. (2020), efficiency in traffic management operations is critical for achieving sustainable urban mobility and minimizing the negative impacts of traffic congestion on the environment and public health. Their study emphasized the role of real-time traffic management strategies, such as dynamic signal control and congestion pricing, in improving traffic flow and reducing travel times. Similarly, Yang et al. (2018) investigated the impact of traffic management efficiency on urban mobility in Shanghai and found that efficient management practices significantly contribute to reduced congestion and improved travel experiences for users.

2.1.3.3. Safety

Safety, a critical aspect of the TSQM, has garnered significant attention in the literature due to its profound implications for user well-being and satisfaction. Safety in traffic management refers to the measures and practices implemented to ensure the protection of road users, including motorists, pedestrians, and cyclists, from accidents, injuries, and fatalities. It encompasses various aspects, such as infrastructure design, traffic regulations enforcement, and public awareness campaigns aimed at promoting safe behavior on the roads. Research on safety in traffic management has highlighted its paramount importance in reducing road traffic injuries and fatalities, improving public health outcomes, and enhancing overall user satisfaction with transportation systems.

According to Gao et al. (2019), safety measures, such as road signage, traffic signals, and enforcement of speed limits, play a crucial role in preventing traffic accidents and minimizing their severity. Their study found that the effectiveness of safety measures significantly influences user perceptions of traffic service quality and satisfaction. Similarly, Wang et al. (2021) conducted research on the safety evaluation of signalized intersections and concluded that well-designed traffic control systems contribute to safer road conditions and higher satisfaction levels among road users.

2.1.3.4. Communication

Communication, an essential dimension of the TSQM, has been recognized as a key driver of user satisfaction and engagement in traffic management processes. Communication in traffic management refers to the exchange of information between traffic authorities or agencies and the public, aimed at disseminating important updates, providing guidance, and addressing inquiries or concerns related to transportation services. Effective communication is essential for promoting transparency, building trust, and facilitating collaboration between stakeholders in managing traffic flow and ensuring road safety. Research on communication in traffic management has emphasized its critical role in enhancing user satisfaction, promoting behavioral change, and fostering public engagement in transportation initiatives.

According to Liu et al. (2020), effective communication between traffic authorities and users is critical for disseminating timely information, addressing user concerns, and fostering collaborative efforts to improve traffic service quality. Moreover, studies by Hu et al. (2019) emphasize the role of communication in building trust and credibility among users, highlighting the need for transparent and responsive communication strategies to enhance user satisfaction and public perception of traffic services.

2.1.3.5. Professionalism of Traffic Personnel

Professionalism of traffic personnel refers to the conduct, competence, and dedication exhibited by traffic officers or personnel in carrying out their duties related to traffic management, enforcement, and assistance to road users. It encompasses various aspects, including adherence to regulations, courtesy towards users, efficiency in managing traffic situations, and responsiveness to inquiries or emergencies. Research on the professionalism of traffic personnel has highlighted

its significant impact on user satisfaction, trust in traffic authorities, and compliance with traffic laws.

Professionalism of traffic personnel, as emphasized in the TSQM, plays a significant role in shaping user experiences and perceptions of traffic service quality. Research by Zhou et al. (2017) suggests that professionalism, including the conduct, competence, and courtesy of traffic personnel, significantly influences user satisfaction and trust in traffic authorities. Similarly, studies by Wang et al. (2020) highlight the importance of professionalism in promoting positive user interactions and fostering a supportive environment for traffic management operations.

2.1.3.6. Fairness in Traffic Enforcement Actions

Fairness in traffic enforcement actions refers to the perceived impartiality, equity, and transparency in the implementation of traffic laws and regulations by authorities, such as traffic personnel or enforcement agencies (Ross, Jennings, & Martinez, 2017). It encompasses various aspects, including the consistency of enforcement, the treatment of individuals from different demographic groups, and the fairness of penalties or fines imposed for traffic violations. Research on fairness in traffic enforcement actions has highlighted its significant influence on citizen satisfaction, trust in traffic authorities, and compliance with traffic laws (Murphy, Tyler, & Curtis, 2020).

The Traffic Service Quality Model (TSQM) provides a comprehensive framework for evaluating and enhancing the quality of traffic services, drawing on multiple dimensions that impact user satisfaction and overall effectiveness of traffic management (Tompson, Tyler, & Smith, 2019). By prioritizing fairness and transparency in enforcement practices, traffic authorities can enhance public support, cooperation, and voluntary compliance, leading to improved road safety outcomes and more effective traffic management (Taniguchi & Thomas, 2014).

2.1.4. Concept of Citizen Satisfaction

The concept of citizen satisfaction refers to the extent to which individuals or communities are content with the goods, services, or experiences provided by public institutions, organizations, or government entities (Higgins, 2009). In the context of traffic management, citizen satisfaction relates to the perceptions and evaluations of road users regarding the quality, efficiency, and effectiveness of traffic services, infrastructure, and regulations.

Citizen satisfaction is influenced by various factors, including the responsiveness of authorities to public concerns, the quality of infrastructure and services, the level of safety and convenience provided, and the overall experience of interacting with traffic management systems (Jiang & Chen, 2018). Positive experiences, such as smooth traffic flow, timely response to incidents, clear communication of information, and fair enforcement of regulations, are likely to enhance citizen satisfaction.

The concept of citizen satisfaction is closely related to the principles of customer satisfaction in the private sector, emphasizing the importance of meeting the needs and expectations of individuals or communities (Johnson & Rapp, 2010). It reflects not only the tangible outcomes of traffic management efforts, such as reduced congestion or improved safety, but also the intangible aspects, such as trust, transparency, and respect for user rights.

Measuring citizen satisfaction involves collecting feedback from road users through surveys, interviews, or online platforms to assess their perceptions, preferences, and experiences with traffic services (Alonso & Lamata, 2006). By understanding the factors that contribute to citizen satisfaction, traffic authorities can identify areas for improvement, prioritize resources, and implement strategies to enhance user experiences and promote sustainable urban mobility.

Overall, the concept of citizen satisfaction serves as a key indicator of the effectiveness and responsiveness of traffic management systems, highlighting the importance of user-centered approaches and stakeholder engagement in shaping transportation policies and practices.

2.2. Review of Empirical Literatures

In order to strengthen the study, various research reports were reviewed. This section highlights some literature and findings from previous researches regarding the effect of Traffic Service quality on citizens' satisfaction.

2.2.1. Accessibility and Citizen Satisfaction

Research on accessibility in traffic services has highlighted its importance in shaping user perceptions, behavior, and overall satisfaction with traffic management efforts. According to Dissanayake and Jayatilleke (2017), accessibility plays a crucial role in influencing user satisfaction and decision-making processes related to traffic services. Their study found that

convenient access to traffic information and service centers positively correlates with higher satisfaction levels among users. Similarly, Zhang et al. (2019) emphasized the significance of accessibility in promoting user engagement and compliance with traffic regulations. Their research underscored the importance of providing accessible and user-friendly information channels to enhance user satisfaction and promote responsible driving behavior.

Furthermore, studies by Ghasemzadeh et al. (2020) and Abay et al. (2021) have examined the impact of accessibility on user perceptions of traffic services in urban environments. Ghasemzadeh et al. (2020) investigated the accessibility of public transportation services and found that improved accessibility positively influences user satisfaction and mode choice decisions. Similarly, Abay et al. (2021) explored the accessibility of traffic management services in Addis Ababa and identified barriers to access, such as limited information availability and inadequate service infrastructure. Their findings underscored the importance of addressing accessibility challenges to enhance user satisfaction and promote sustainable urban mobility. In summary, accessibility plays a critical role in shaping user perceptions and satisfaction with traffic services.

2.2.2. Efficiency and Citizen Satisfaction

Efficiency, as one dimension of the TSQM has been extensively studied in the context of traffic management processes and their impact on user satisfaction. Research by Li et al. (2020) suggests that the efficiency of traffic management operations, including response time to incidents and effectiveness of congestion mitigation measures, directly influences user perceptions of service quality and satisfaction. Moreover, efficiency in traffic management has been linked to improved traffic flow, reduced congestion, and enhanced user experiences, as noted by Yang et al. (2018) in their study on the effects of traffic management efficiency on urban mobility.

Efficiency in incident management is another key aspect of traffic management processes. Research by Wang et al. (2020) examined the effectiveness of real-time incident detection and response systems in Beijing and concluded that timely intervention and coordination among traffic authorities are essential for minimizing the impact of incidents on traffic flow and reducing delays. Moreover, studies by Han et al. (2019) and Yu et al. (2021) highlighted the importance of efficiency in traffic enforcement actions, such as ticketing and penalty enforcement, in deterring traffic violations and promoting compliance with traffic laws.

In addition to its direct impact on traffic flow and safety, efficiency in traffic management processes has implications for user satisfaction and perception of transportation services. Research by Li et al. (2020) and Zhang et al. (2019) found that users value efficient traffic operations and are more satisfied with transportation services when they experience minimal delays and disruptions. Therefore, improving efficiency in traffic management processes is essential for enhancing user experiences, promoting sustainable urban mobility, and achieving overall transportation system goals.

2.2.3. Safety and Citizen Satisfaction

Research on safety measures has highlighted its significant influence on citizen satisfaction in the context of traffic management processes and their impact on user satisfaction. Studies by Gao et al. (2019) and Wang et al. (2021) underscore the importance of safety measures, such as road signage, traffic signals, and enforcement of speed limits, in shaping user perceptions of traffic service quality and satisfaction. Furthermore, research by Chen et al. (2018) highlights the role of safety in promoting user trust and confidence in traffic authorities, emphasizing the need for robust safety measures to enhance overall user satisfaction and road safety outcomes.

Furthermore, Chen et al. (2018) and Zhang et al. (2019) investigated the impact of safety measures on user compliance with traffic regulations. Chen et al. (2018) found that perceptions of safety positively influence user trust and confidence in traffic authorities, leading to greater compliance with traffic laws. Similarly, Zhang et al. (2019) emphasized the importance of safety in route choice behaviors, with users preferring routes that offer higher levels of safety and lower risk of accidents.

In addition to its direct impact on road safety outcomes, safety in traffic management has broader implications for public health and well-being. Research by WHO (2020) indicates that road traffic injuries are a leading cause of death and disability worldwide, particularly in low- and middle-income countries. Therefore, implementing effective safety measures and promoting safe behavior on the roads are essential for reducing the burden of road traffic injuries and promoting sustainable urban mobility. In summary, safety in traffic management is a critical determinant of user satisfaction.

2.2.4. Communication and Citizen Satisfaction

Communication as one dimension of the TSQM has been extensively studied in the context of traffic management processes and their impact on user satisfaction. Liu et al. (2020) investigated the impact of traffic information communication on the travel mode choice of urban residents and found that clear and timely communication influences user decisions and perceptions of transportation services. Their study highlighted the importance of providing accurate and accessible information to users through various channels, such as mobile applications and social media platforms, to improve user experiences and satisfaction levels. Similarly, Hu et al. (2019) emphasized the role of communication in building trust and credibility among users, particularly in emergency situations or during traffic disruptions.

Furthermore, Taniguchi and Thomas (2014) and Tompson et al. (2019) examined the relationship between communication and user compliance with traffic regulations. Taniguchi and Thomas (2014) found that effective communication strategies, such as public awareness campaigns and traffic signage, positively influence user perceptions of traffic safety and encourage compliance with traffic laws. Similarly, Tompson et al. (2019) investigated the impact of communication on public trust in law enforcement agencies and concluded that transparent and responsive communication is essential for maintaining public support and cooperation in traffic management efforts.

In addition to its impact on user satisfaction and compliance behavior, communication in traffic management has broader implications for stakeholder engagement and collaboration. Research by Liu et al. (2020) and Zhou et al. (2017) emphasized the importance of engaging with local communities, businesses, and other stakeholders in decision-making processes and collaborative efforts to improve traffic service quality. By fostering open communication channels and soliciting feedback from stakeholders, transportation authorities can enhance public participation, address community concerns, and achieve greater success in implementing traffic management initiatives. In summary, communication in traffic management is a critical determinant of user satisfaction, trust in traffic authorities.

2.2.5. Professionalism of Traffic Personnel and Citizen Satisfaction

Professionalism of Traffic Personnel has been extensively studied in the context of traffic management processes and their impact on user satisfaction. Zhou et al. (2017) conducted an

empirical study to understand the relationship between service quality and citizens' satisfaction with urban traffic personnel in China. They found that professionalism, including the demeanor and competence of traffic personnel, significantly influences user perceptions of service quality and satisfaction levels. Users value interactions with traffic officers who exhibit professionalism, such as providing clear instructions, demonstrating empathy towards road users, and resolving disputes impartially.

Similarly, Wang et al. (2020) investigated the role of professionalism in promoting positive user interactions and fostering a supportive environment for traffic management operations. Their study emphasized the importance of training and equipping traffic personnel with the necessary skills and knowledge to handle diverse traffic situations professionally and effectively. They found that professionalism contributes to higher levels of user satisfaction and trust in traffic authorities, leading to improved compliance with traffic regulations.

Furthermore, Zhang et al. (2019) and Taniguchi and Thomas (2014) examined the impact of professionalism on user compliance with traffic laws. Zhang et al. (2019) found that users are more likely to comply with traffic regulations when they perceive traffic personnel to be professional and fair in their enforcement actions. Similarly, Taniguchi and Thomas (2014) highlighted the importance of professionalism in shaping user perceptions of traffic safety and encouraging adherence to traffic laws through positive role modeling and effective communication.

In addition to its influence on user satisfaction and compliance behavior, professionalism of traffic personnel has broader implications for public trust and confidence in traffic authorities. Research by Chen et al. (2018) and Wang et al. (2021) emphasized the role of professionalism in building trust and credibility among users, particularly in emergency situations or during traffic disruptions. By upholding high standards of professionalism, traffic authorities can enhance public trust, promote cooperative interactions with users, and achieve greater success in managing traffic flow and ensuring road safety.

2.2.6. Fairness in Traffic Enforcement Actions and Citizen Satisfaction

Research on fairness in traffic enforcement actions has highlighted its significant influence on citizen satisfaction, trust in traffic authorities, and compliance with traffic laws. Brown and Benedict (2002) conducted a study on procedural justice and police legitimacy, emphasizing the

importance of fairness in law enforcement actions in fostering public cooperation and compliance with traffic laws. Their research found that perceptions of procedural fairness, including the fairness and transparency of enforcement procedures, positively influence citizen satisfaction and trust in law enforcement agencies. Similarly, Ross et al. (2017) investigated the relationship between fairness in traffic enforcement actions and citizen satisfaction with law enforcement agencies, finding that perceived fairness is a key predictor of public support and cooperation in traffic management efforts.

Furthermore, Tyler and Wakslak (2004) and Taniguchi and Thomas (2014) examined the impact of fairness in traffic enforcement actions on citizen compliance with traffic regulations. Tyler and Wakslak (2004) found that individuals are more likely to comply with traffic laws when they perceive enforcement actions to be fair and legitimate, irrespective of the outcome. Similarly, Taniguchi and Thomas (2014) observed that fairness in traffic enforcement positively influences self-reported compliance behavior among drivers, indicating the importance of fairness in promoting voluntary adherence to traffic regulations.

In addition to its impact on citizen satisfaction and compliance behavior, fairness in traffic enforcement actions has implications for social equity and public trust in the justice system. Research by Tompson et al. (2019) and Murphy et al. (2020) suggests that disparities in enforcement practices, such as racial or socioeconomic profiling, can erode public trust and confidence in law enforcement agencies, leading to perceptions of injustice and inequality. Therefore, ensuring fairness and equity in traffic enforcement actions is essential for upholding public trust, maintaining social cohesion, and promoting the legitimacy of traffic management efforts. In summary, fairness in traffic enforcement actions is a critical determinant of citizen satisfaction,

2.3. Gaps Identified Based on The Literature

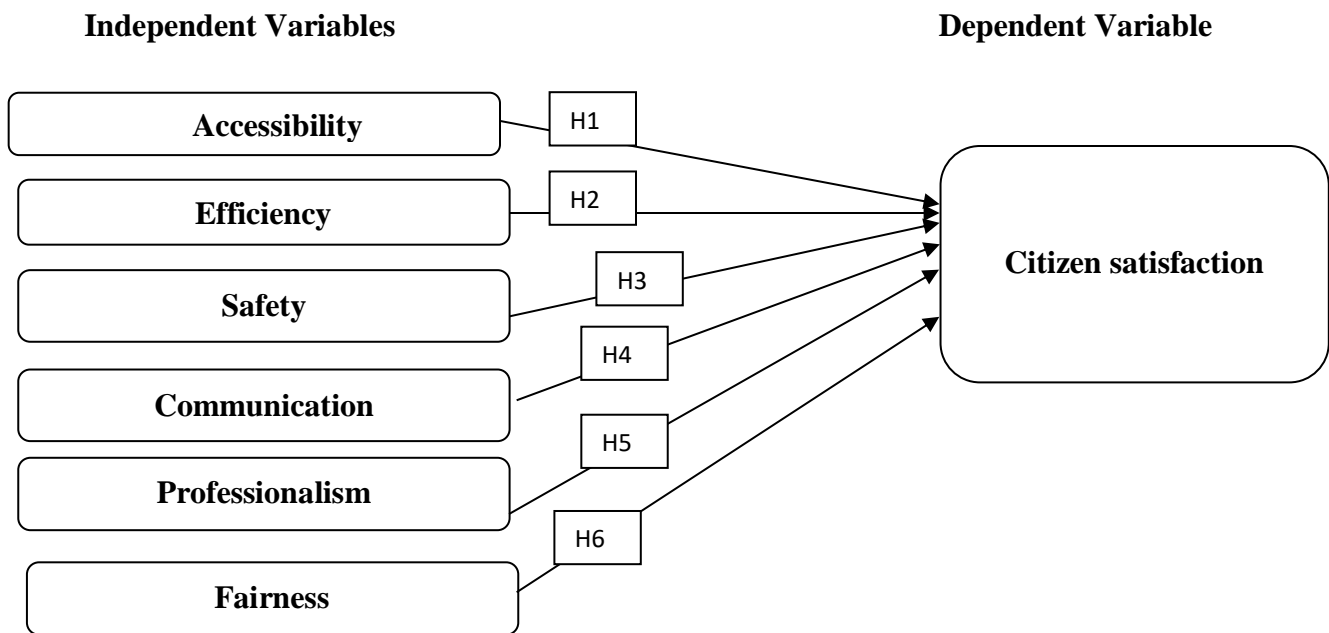
Overall, the literature review extensively explores the impact of various factors on citizen satisfaction with traffic services, including accessibility, efficiency, safety, communication, professionalism of traffic personnel, and fairness in traffic enforcement actions. Despite the wealth of research on these topics, there appears to be a gap in the literature specific to the context of Addis Ababa, Ethiopia. While some studies examine similar factors in urban environments, such as China, there is a lack of empirical research focusing specifically on Addis Ababa's traffic

management challenges and the factors influencing citizen satisfaction in this particular context. Therefore, there is a need for studies that explore the unique characteristics of Addis Ababa's traffic services, considering factors such as infrastructure limitations, cultural norms, and socioeconomic factors that may influence citizen satisfaction and perceptions of traffic management efforts. Additionally, research addressing the effectiveness of existing traffic management strategies and potential areas for improvement within the context of Addis Ababa would be valuable for informing policy decisions and enhancing the quality of traffic services in the city. Therefore, this research gap motivates the researcher to investigate the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration.

2.3. Conceptual Framework

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Kombo & Tromp, 2009). Based on the theoretical and empirical literature concerning the relationship between traffic center service quality and citizen satisfaction, the present study develops the following conceptual framework.

Figure 2.1 Conceptual Framework



Source: (Zhou, et al. 2017; Han, et al. 2019; Liu, et al. 2020; Brown & Chin, 2020)

This study is mainly based upon The Traffic Service Quality Model (TSQM) that provides a comprehensive framework for assessing the quality of traffic services, encompassing multiple dimensions including accessibility, efficiency, safety, fairness in traffic enforcement actions, communication and professionalism of traffic personnel (Jain, 2010; Zhou, et al. 2017; and Jiang, & Chen, 2018).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

In this chapter, the researcher provides a comprehensive overview of the methodologies employed to conduct this study. It begins by detailing the research design and rationale, followed by a description of the target population and the sampling techniques used to select participants. The chapter also outlines the data collection instruments and procedures, ensuring that the methods are appropriate and reliable for gathering the necessary information. Furthermore, the data analysis methods are explained, highlighting how the collected data will be processed and interpreted to address the research questions. By systematically describing these procedures, this chapter establishes a clear framework for how the study was conducted, ensuring transparency and rigor in the research process.

3.2. Research Approach

Regarding the research approach, this study employed a quantitative methodology to analyze the components of traffic service quality that impact citizen satisfaction in Addis Ababa. A quantitative approach was necessary to statistically test the relationships among variables. Numerical data was utilized and analyzed using statistical tools, including descriptive statistical methods such as frequency, mean, and standard deviation, as well as inferential statistical methods like simple correlation and multiple regressions. By utilizing a quantitative approach, the researcher was able to measure citizens' perceptions of service quality and assess the level of citizen satisfaction with traffic services in Addis Ababa.

3.3. Research Design

The choice of research design depends on the objectives that researchers aim to achieve (Newing, 2011). The primary aim of this study was to investigate the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration. To achieve this objective, the researcher employed both descriptive and explanatory research designs through the use of a survey questionnaire. According to Lavrakas (2008), a descriptive survey research design is a systematic method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or

open-ended questions, observations, and interviews. It is one of the most widely used non-experimental research designs across disciplines to collect large amounts of data from a representative sample of the targeted population.

Additionally, the study utilized an explanatory research design to empirically test the relationships between the independent and dependent variables. Explanatory research design helps to understand the nature of these relationships, specifically the cause and effect between service quality and citizen satisfaction with traffic services. By employing both descriptive and explanatory research designs, the study aimed to provide a comprehensive analysis of how Traffic Service quality impacts citizen satisfaction in Addis Ababa.

3.4. Target Population and Sampling Procedure

3.4.1. Target Population

According to Lavrakas (2008), a population is defined as any finite or infinite collection of individual elements. This study aims to examine the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration. The target population for this study comprises individuals who reside in Addis Ababa, the capital city of Ethiopia, and are actively involved in traffic activities within the city. This includes residents, commuters, pedestrians, drivers, passengers, and other stakeholders who interact with Traffic Services while navigating the urban environment. These individuals are considered customers of the Traffic Management and Control Department of the Addis Ababa City Administration.

3.4.2. Sample Size

Sample size refers to the number of items to be selected from the universe to constitute a sample (Lavrakas, 2008). Obviously, such a sample should be typically identical with the population thus provide adequate representation. If a sample is not precise and inadequate both in characteristic and size, it may lead to rejection of false null hypothesis, wrong result and therefore a waste of resources (Gerstman, 2003). Likewise, a study that collects too much data is wasteful. Therefore, it is essential to establish adequate sample size before going on data collection for a study. When the size of population is infinite or more than 10,000, thus the sample size is calculated for the list

favorable case $p = q = 0.5$ (Corbetta, 2003). Indeed, as the variability is measured by \sqrt{pq} , it is easy to see that this index assumes its highest value when $p = q = 0.50$ (Corbetta, 2003).

Since the total population is infinite, to determine the estimate of p and q , the study will use the recommendation by Corbetta (2003) in determining the standard deviation, 95% confidence interval and 5% sampling error in calculating the sample size. The sample size for this study was determined with the use formula as presented below (Dillon, 1993).

$$n = \frac{z^2 \cdot p \cdot q}{e^2}$$

Where: n = required sample size

Z = Degree of confidence (i.e. 1.96^2)

P = Probability of positive response (0.5)

Q = Probability of negative response (0.5)

E = Tolerable error $(0.05)^2$

$$n = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2$$

$$n = 3.8416 \times 0.5 \times 0.5 / 0.0025$$

$$n = 384.16 \approx 384 \text{ Citizens}$$

Therefore, a sample of 384 customers of Traffic Management and Control Department of the Addis Ababa City Administration were as sample.

3.4.3. Sampling Technique

Sampling technique refers to the process by which the entities of the sample are selected (Cooper & Schindler, 2006). The sampling technique used for this study was non-probability sampling. Non-probability sampling is defined as any sampling method where some elements of the population have no chance of selection, or where the probability of selection cannot be accurately determined (Twumasi, 2002). Specifically, the study employed convenience sampling techniques to complete the structured questionnaire on a voluntary basis. Convenience sampling is a non-probability sampling method where subjects are chosen due to their convenient accessibility and proximity to the researcher (Black et al., 1999).

There are two main reasons for using convenience sampling in this study: First, there is no complete listing of the target population, meaning no formal sampling frame exists. Second, this method provides better results within the constraints of a limited budget and time.

3.5. Data Sources and Data Collection Method

The necessary data for this study was collect from both primary and secondary sources. According to Kothari (2004), primary data are fresh data that are gathered for the first time and thus happened to be original in character. The study utilized questionnaire as major instrument for collecting primary data. A questionnaire was preferred because of its convenience and ease of administration. In view of the advantages and the need to gather more information, questionnaire was administered to customers to solicit their views concerning the effect of service quality on citizen satisfaction. The study used closed-ended questions. This is due to the fact that closed-ended questions are often good for surveys, because one can get higher response rates. Besides, answers to closed-ended questions can easily be coded and analyzed makes them particularly useful when trying to prove the statistical significance of a survey's results.

3.6. Measurement Instrument Design, Reliability and Validity

There is always more than one way to measure any variable, a researcher has to attempt to construct the best measure or measures for each variable. Considering this, data first need to be analyzed to ensure instrument quality. Measurement instrument design, reliability and validity are the major criteria that was used to evaluate measurement.

3.6.1. Measurement Instrument Design

Measurements of service quality and citizen satisfaction in traffic service context was adopted and from the previous studies with some modification (See Appendix I), and a five-point Likert scale ranging from 1=Strongly Disagree to 5=Strongly Agree was used. In the traffic services context, service quality was measures based on The Traffic Service Quality Model (TSQM), which was based upon six services quality dimensions, namely: accessibility, efficiency, safety, fairness in traffic enforcement actions, communication and professionalism of traffic personnel, which was adopted from various literature (Zhou, et al. 2017; Han, et al. 2019; Liu & Wang, 2019; Singh & Prasher, 2020; Liu, et al. 2020; Brown & Chin, 2020; and Abay, et al., 2021). The description of measurements of each dimensions illustrated in Table 3.1.

Table 3.1: Measurement Instrument Design

Variable	Dimension/ Factor	No of Items	Source Author
Independent Variables (Traffic Service Quality Dimensions)	Accessibility	5	Abay, et al., (2021)
	Efficiency	5	Han, et al. (2019); Singh & Prasher, (2020)
	Safety	5	Liu & Wang, (2019)
	Communication	5	Liu, et al. (2020)
	Professionalism	5	Brown & Chin, (2020)
	Fairness	5	Zhou, et al. (2017)
Dependent variable	Citizen Satisfaction	10	Jain, (2010), Zhou, et al. (2017)

Accessibility: This dimension measures the ease of access to traffic services. The questionnaire items were adapted from previous studies on service accessibility in similar contexts (Abay, et al., 2021). To ensure relevance to the study's objectives, wording adjustments were made to align with the specific context of Addis Ababa.

Efficiency: This factor assesses the effectiveness and timeliness of traffic services. The questionnaire items were originally sourced from the work of (Han, et al. 2019; Singh & Prasher, 2020) and were customized to suit the local context. Some items were merged for clarity, and additional items were included to capture nuances specific to traffic service efficiency in Addis Ababa.

Safety: This dimension evaluates perceptions of safety related to traffic management. The questionnaire items were adapted from a validated scale used in previous studies on traffic safety (Liu & Wang, 2019)). Some items were rephrased to enhance clarity, and new items were added to address safety concerns specific to Addis Ababa's traffic environment.

Communication: This factor gauges the effectiveness of communication between traffic authorities and citizens. Questionnaire items were derived from the literature on communication satisfaction (Liu, et al. 2020) and were customized to reflect the communication dynamics in Addis Ababa's traffic management context.

Professionalism: This dimension assesses the professionalism exhibited by traffic personnel. The questionnaire items were adapted from established measures of service professionalism (Brown & Chin, 2020) and were tailored to capture the specific behaviors and attitudes expected of traffic personnel in Addis Ababa.

Fairness: This factor evaluates perceptions of fairness in traffic enforcement actions. Questionnaire items were drawn from previous research on procedural justice in law enforcement (Zhou, et al. 2017) and were adjusted to reflect the fairness concerns pertinent to traffic enforcement in Addis Ababa.

Citizen Satisfaction: This variable measures overall satisfaction with traffic services. The questionnaire items were compiled from validated scales used in studies on citizen satisfaction with public services (Jain, 2010; Zhou, et al. 2017). Some items were modified to address the specific context of traffic services in Addis Ababa.

3.6.2. Instrument Validity

Validity refers to the extent to which the scores obtained from a measure accurately represent the variable they are intended to measure (Gakure, 2010). In other words, it assesses whether the instrument is measuring what it is supposed to measure. Content validity, a type of validity, measures the extent to which a test effectively covers the breadth of a concept or domain (Oyerinde, 2011). It ensures that the items in the instrument adequately represent the scope of the study and align with its objectives. To confirm the content validity of the pilot questionnaire, experts (those working traffic management office in Addis Ababa) in the field evaluated each question to determine its relevance to the variables being measured. Based on comments given, necessary adjustments were made to ensure that the questionnaire effectively captured the intended constructs and provided meaningful answers to the study objectives.

3.6.3. Instrument Reliability

The study employed Cronbach's alpha coefficient to assess the reliability of the questionnaire. Cronbach's alpha coefficient ranges from 0 to 1, with 0 indicating a high level of measurement error and 1 indicating perfect internal consistency (Oyerinde, 2011). A reliability coefficient (alpha) of 0.70 or higher is generally considered acceptable and reliable, especially for new

questionnaires. As shown in Table 3.1 below, all the instruments yielded Cronbach's alpha values within the recommended range, indicating satisfactory internal consistency reliability.

Table 3.2: Reliability Test Result

NO	Constructs	Number of items	Cronbach Alpha
1.	Accessibility	5	0.771
2.	Efficiency	5	0.876
3.	Safety	5	0.876
4.	Fairness in traffic enforcement actions	5	0.856
5.	Communication	5	0.845
6.	Professionalism of traffic personnel	5	0.756
7.	Citizen Satisfaction	10	0.786

Source: (Own Survey, 2024)

3.7. Data Processing and Analyzing

Quantitative data collected through the survey questionnaire was encoded into Statistical Package for Social Science (SPSS) version 21.0. Then descriptive statistics and inferential statistical was used for analysis. The descriptive statistical results were presented like tables, frequency distributions and percentages to give a condensed picture of the data. This was achieved through summary statistics, which includes the means, standard deviations values which was computed for each variable in this study. Besides, inferential statistics such as correlation analysis and multiple linear regression analysis was used to test the relationships and to determine the relative importance of each independent variable in explaining the variation citizen satisfaction with Traffic Service in Addis Ababa.

3.8. Model Specification

The ordinary square model (OLS model) was used in the study, with traffic service quality dimensions (accessibility, efficiency, safety, fairness in traffic enforcement actions, communication and professionalism of traffic personnel) as independent variables and citizen satisfaction as the dependent variable. The following multiple linear regression equation was used to examine the effect of traffic services quality on citizen satisfaction in with Traffic Service in Addis Ababa.

$$Y_i = \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_4 x_{i4} + \beta_5 x_{i5} + \beta_6 x_{i6} + e$$

Where Y_i represents citizen satisfaction in with Traffic Service in Addis Ababa, while X_1 , X_2 , X_3 , X_4 , X_5 , and X_6 represent the independent variables six traffic services quality dimensions which are: accessibility, efficiency, safety, fairness in traffic enforcement actions, communication and professionalism of traffic personnel. β_0 is the constant, while β_1 , β_2 , β_3 , β_4 , β_5 , and β_6 represent corresponding coefficients or parameters for the respective independent variables to be estimated and e represent the error term that captures all relevant variables not included in the model.

3.9. Ethical Consideration

In terms of ethics, meticulous efforts were undertaken to safeguard the privacy and confidentiality of all respondents, ensuring that their identities and responses remained anonymous. Questionnaires were distributed based on each respondent's voluntary participation. Prior consent was obtained from the administrative authority of the company after elucidating the significance of the study.

All study participants were provided with comprehensive information regarding the study's purpose, and verbal consent was obtained from each participant before data collection commenced. Participants were explicitly informed of their right to withdraw from or decline participation in the study at any point. Furthermore, to ensure confidentiality, the names of the interviewees were not recorded on the questionnaires.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

This chapter focuses on the analysis, presentation and discussion of data collected from respondents through questionnaires. The data analysis and interpretation were conducted in accordance with the study's objective, which aimed to investigate the effect of Traffic Service quality on citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration. The chapter presents empirical findings and results derived from the application of the study variables using the techniques outlined in the third chapter.

4.1 Response Rate

The researcher distributed a total of three hundred and eighty-four (384) questionnaires. Of these, two hundred and ninety-four (294) questionnaires were completed and returned, resulting in a response rate of 76.5%. The non-response rate was 23.5%.

Table 4.1: Response Rate

Response rate	Sample size	Percentage (%)
Returned questionnaires	294	76.5
Un-returned questionnaires	90	23.5
Total	384	100

Source, (Own Survey, 2024)

According to Mugenda (2003), a response rate of 50% is considered good, while a response rate exceeding 70% is deemed very good. Therefore, the 76.5% response rate achieved in this study is considered highly satisfactory. It indicates a robust level of engagement from the respondents, providing ample data for analysis and drawing conclusions.

4.2 General Information of Respondents

This section provides an overview of the general information obtained from the respondents, including their gender, age, educational qualification, and duration of residence in Addis Ababa. While this information may not directly address the research objectives, it helps to assess the

demographic characteristics of the respondents and their potential contribution to the investigation. The results are presented in Table 4.2 below.

Table 4.2 General Information of the respondent

Questions	Factor level	Frequency	Percentage
Gender	Male	170	57.8%
	Female	124	42.2
	Total	294	100%
Age	18 – 29 years	97	33.0%
	30 - 40 years	126	42.9%
	41-50 years	49	16.7%
	Over 50 years	22	7.5%
	Total	294	100%
Educational qualification	Secondary	65	22.1%
	Diploma	22	7.5%
	Degree	149	37.8%
	Master	58	19.7%
	Total	294	100%
How long have you been residing in Addis Ababa?	Less than 1 years	21	7.1%
	1– 5 years	81	27.6%
	6 – 10 years	122	41.5%
	Above 10 years	70	23.8%
	Total	294	100.0%

Source: Own Survey (2024)

Gender Distribution: The study achieved a balanced representation of both males and females, with 57.8% male respondents and 42.2% female respondents. This balanced gender distribution ensures that perspectives from both sexes are adequately captured, enhancing the inclusivity and validity of the study findings.

Age Composition: The age distribution of respondents demonstrates a diverse representation across different age groups. The majority of respondents (42.9%) fell within the 30-40 years age range, followed by those aged 18-29 years (33.0%). While older age groups were less represented, the study still captured perspectives from a range of age demographics, providing a comprehensive understanding of citizen satisfaction across generations.

Educational Qualifications: Respondents exhibited varied levels of educational attainment, with the majority holding a degree (50.7%). Additionally, significant proportions of respondents had achieved secondary education (22.1%) or held a master's degree (19.7%). This high level of educational attainment among respondents indicates a well-informed and potentially discerning population capable of providing insightful feedback on traffic services.

Duration of Residence: The duration of residence in Addis Ababa varied among respondents, with a notable proportion (41.5%) residing in the city for 6-10 years. Additionally, significant percentages of respondents had resided in the city for 1-5 years (27.6%) and above 10 years (23.8%). This diversity in residence duration suggests a broad spectrum of experiences and perspectives on traffic services, spanning both short-term and long-term residents.

Overall, the demographic characteristics of the respondents indicate a diverse and representative sample, ensuring that the study captures a wide range of perspectives on traffic service quality and citizen satisfaction in Addis Ababa. This comprehensive representation enhances the reliability and applicability of the study findings for informing policy and decision-making processes in traffic management and urban planning.

4.3 Perception of Citizens Towards Traffic Service Quality

The first specific objective of study is to evaluate the perception of citizens regarding the quality of traffic services in Addis Ababa. To achieve this, descriptive statistics were employed, providing a comprehensive overview of the data collected from respondents. This section discusses the descriptive statistics of perception of citizen towards the service quality measures using the difference dimensions of traffic service quality measures that were collected by the questionnaire. Respondents' perception about traffic service quality in Addis Ababa were captured along the various items corresponding to the six dimensions that were introduced to measure the study area under each of the service quality measurements such as, accessibility, efficiency, safety, fairness in traffic enforcement actions, communication, and professionalism of traffic personnel. In this regard, the descriptive parts of this study were analyzed based on using a descriptive statistic of mean and standard deviation. Accordingly, the composite mean value shows the average of all respondents' perceptions on a certain dimensional question. While, standard deviation shows how diverse are the perceptions of respondents for a given dimensional questions. A range of mean was

constructed by using itemized Likert rating scale. The researcher was used (Shrestha, 2015) guide to interpret the result which is presented in the Table 4.3.

Table 4.3: Descriptive statistics result interpretation guide

Interval of Means	Interpretation
1.00 – 1.80	Very Low
1.81 – 2.60	Low
2.61 – 3.40	Medium
3.41 – 4.20	High
4.21 – 5.00	Very High

Source: (Shrestha, 2015)

4.3.1. Respondents Perception on Accessibility of Traffic Service

The study analyzed the respondents' perceptions of the accessibility of traffic services in Addis Ababa using various indicators. The result of mean score value and standard deviation illustrated in the Table 4.4.

Table 4.4: Respondents Perception on Accessibility of Traffic Service

Indicators	Mean	STD
Traffic information is easily accessible to the public.	2.48	1.238
Traffic Service centers are conveniently located.	2.65	1.126
It is easy to reach traffic personnel through various communication channels.	2.76	1.147
Traffic services are available at convenient times.	2.81	1.000
Traffic personnel provide timely updates on road conditions and traffic regulations.	2.96	1.049
Grand Mean	2.73	1.11

Source: Own Survey (2024)

As indicated on the table 4.4, the mean score for the accessibility of traffic information to the public was 2.48 with a standard deviation of 1.238, indicating that respondents generally found traffic information not easily accessible, with significant variability in opinions. Traffic Service centers were perceived to be conveniently located, scoring a mean of 2.65 and a standard deviation

of 1.126, reflecting a slightly higher but still below-average satisfaction. The ease of reaching traffic personnel through various communication channels had a mean score of 2.76 and a standard deviation of 1.147, suggesting slightly better but still subpar perceptions. Respondents rated the availability of traffic services at convenient times with a mean of 2.81 and a standard deviation of 1.000, indicating closer to neutral satisfaction levels and more consistent responses. The provision of timely updates on road conditions and traffic regulations had the highest mean score of 2.96 with a standard deviation of 1.049, showing relatively better perceptions but still not reaching average satisfaction.

The overall grand mean of 2.73 and a standard deviation of 1.11 indicate that the accessibility of traffic services is generally perceived to be below average, with moderate variability in respondents' views across all indicators. These findings imply a need for significant improvements in the accessibility of traffic services, particularly in making traffic information more readily available and locating service centers more conveniently. Enhancing communication channels for easier reach to traffic personnel could improve public satisfaction. Although the availability of traffic services at convenient times and the timeliness of updates are relatively better perceived, there is still room for improvement to meet public expectations more effectively. The varied satisfaction levels across different indicators suggest inconsistencies in service provision, highlighting the need for a more uniform approach to enhance overall accessibility and timeliness. Policymakers should use these insights to devise strategies for improving traffic service quality, focusing on areas of dissatisfaction to achieve more targeted and effective improvements.

4.3.2. Respondents Perception on Efficiency of Traffic Service

The analysis of respondents' perceptions regarding the efficiency of traffic services in Addis Ababa, as detailed in Table 4.5, reveals a general dissatisfaction. The mean score for the quick response of traffic personnel to incidents and emergencies is 2.62, with a standard deviation of 0.787, indicating a perception of below-average response times and relatively consistent views among respondents. The coordination and efficiency of traffic management processes scored a mean of 2.61 and a standard deviation of 1.194, reflecting a slightly below-average perception with significant variability in opinions. Traffic flow management during peak hours received a mean score of 2.65 and a standard deviation of 0.903, suggesting that while perceptions are slightly more positive, they remain below average, with moderate variability in responses. The procedures

for reporting traffic incidents were perceived as inefficient and not straightforward, scoring a mean of 2.36 and a standard deviation of 0.869, indicating a consistent perception of dissatisfaction. The effectiveness of traffic personnel in reducing congestion had the highest mean score of 2.79, with a standard deviation of 1.042, showing moderate satisfaction but still falling below average, with considerable variability in opinions.

Table 4.5: Respondents Perception on Efficiency of Traffic Service

Indicators	Mean	STD
Traffic personnel respond quickly to incidents and emergencies.	2.62	.787
Traffic management processes are well-coordinated and efficient.	2.61	1.194
Traffic personnel effectively manage traffic flow during peak hours.	2.65	.903
The procedures for reporting traffic incidents are straightforward and efficient.	2.36	.869
Traffic personnel reduce congestion effectively.	2.79	1.042
Grand Mean	2.61	0.95

Source: Own Survey (2024)

The overall grand mean of 2.61 and a standard deviation of 0.95 further underscore the perception of below-average efficiency in traffic services. These findings imply a pressing need for improvements in several areas. Enhancing response times to incidents and emergencies is critical to improving public satisfaction. Additionally, better coordination and more efficient traffic management processes are necessary to address perceived inefficiencies. Improving traffic flow management during peak hours and adopting advanced technologies could help mitigate congestion. Simplifying the procedures for reporting traffic incidents would also enhance efficiency and public trust. Lastly, more effective strategies to reduce traffic congestion are needed to meet public expectations better. Policymakers should focus on these highlighted areas of dissatisfaction to devise strategies that address these inefficiencies, ultimately leading to more efficient and satisfactory traffic service delivery in Addis Ababa.

4.3.3. Respondents Perception on Safety Measures of Traffic Service

The analysis of respondents' perceptions of the safety measures implemented by traffic services in Addis Ababa, as detailed in Table 4.6, reveals a generally average perception with room for improvement.

Table 4.6: Respondents Perception on Safety Measures of Traffic Service

Indicators	Mean	STD
Traffic personnel enforce safety measures consistently.	2.97	.970
Road signage and signals are well-maintained and visible.	2.71	.985
Traffic personnel presence increases my sense of safety on the roads.	2.93	1.018
Traffic personnel effectively enforce speed limits and other safety regulations.	2.81	.967
Traffic personnel provide helpful safety tips and information to the public.	3.33	1.101
Grand Mean	2.95	1.00

Source: Own Survey (2024)

The mean score for the consistent enforcement of safety measures by traffic personnel is 2.97, with a standard deviation of 0.970, indicating a close-to-average perception and moderate variability in opinions. The maintenance and visibility of road signage and signals received a lower mean score of 2.71 and a standard deviation of 0.985, reflecting below-average satisfaction and moderate variability in responses. The presence of traffic personnel was perceived to increase the sense of safety on the roads with a mean of 2.93 and a standard deviation of 1.018, suggesting a moderately positive but slightly below-average perception with moderate variability. The enforcement of speed limits and other safety regulations had a mean score of 2.81 and a standard deviation of 0.967, indicating a below-average perception with moderate variability in opinions. Notably, the provision of helpful safety tips and information by traffic personnel scored the highest mean of 3.33, with a standard deviation of 1.101, indicating above-average satisfaction but with considerable variability in responses.

The overall grand mean of 2.95 and a standard deviation of 1.00 suggest that the safety measures of traffic services are perceived as close to average. This perception implies a need for improvement in several areas. Enhancing the consistency of safety measure enforcement could

improve public trust and compliance with safety regulations. Improving the maintenance and visibility of road signage is crucial for enhancing road safety. Increasing the effectiveness and reassuring presence of traffic personnel can further enhance the public's sense of safety. More stringent and visible enforcement of speed limits and other safety regulations is necessary for better adherence to safety norms and reduced traffic incidents. Additionally, the positive perception of the provision of safety tips and information by traffic personnel indicates a strength that can be leveraged for broader safety campaigns. Policymakers should address these areas of dissatisfaction to enhance overall traffic safety management and public satisfaction in Addis Ababa.

4.3.4. Respondents Perception on Fairness in Traffic Enforcement Actions

The analysis of respondents' perceptions regarding the fairness of traffic enforcement actions in Addis Ababa, as detailed in Table 4.7, reveals a generally below-average perception across various indicators.

Table 4.7: Respondents Perception on Fairness in Traffic Enforcement Actions

Indicators	Mean	STD
Traffic personnel enforce traffic laws impartially.	2.66	1.002
I believe that traffic personnel treat all citizens equally.	2.69	1.053
The penalties imposed by traffic personnel are fair and appropriate.	2.85	.847
Traffic personnel handle disputes impartially and professionally.	2.69	.853
There is no discrimination in traffic law enforcement based on socioeconomic status.	2.74	.934
Grand Mean	2.72	0.93

Source: Own Survey (2024)

The mean score for the impartial enforcement of traffic laws by traffic personnel is 2.66, with a standard deviation of 1.002, indicating a perception of below-average impartiality and moderate variability in opinions. The perception of equal treatment by traffic personnel scored slightly higher at 2.69, with a standard deviation of 1.053, reflecting significant variability in views. The fairness and appropriateness of penalties imposed by traffic personnel had a mean score of 2.85 and a standard deviation of 0.847, indicating closer to average satisfaction but still below average, with more consistent responses. The impartial and professional handling of disputes by traffic

personnel scored a mean of 2.69 with a standard deviation of 0.853, showing below-average perceptions and more consistent opinions. The perception of the absence of discrimination based on socioeconomic status in traffic law enforcement had a mean score of 2.74 and a standard deviation of 0.934, indicating slightly better but still below-average perceptions and moderate variability in opinions.

The overall grand mean of 2.72 and a standard deviation of 0.93 suggest that the fairness in traffic enforcement actions is perceived as below average. This general dissatisfaction has several implications. There is a clear need for more transparent and unbiased enforcement practices to ensure impartial law enforcement. Training traffic personnel to apply laws consistently and promoting policies that ensure equal treatment of all citizens, regardless of background, can help improve public trust. Although perceptions of the fairness of penalties are relatively better, ensuring that penalties are proportionate and consistently applied can further enhance the perception of fairness. Improving the professionalism in handling disputes is crucial, which can be achieved through targeted training programs focused on conflict resolution and professional conduct. Addressing the perception of discrimination based on socioeconomic status requires strict anti-discrimination policies and monitoring of enforcement actions to ensure fairness.

4.3.5. Respondents Perception on Communication

The analysis of respondents' perceptions of the communication effectiveness of traffic services in Addis Ababa, as detailed in Table 4.8, reveals a generally below-average perception across various indicators.

Table 4.8: Respondents Perception on Communication

Indicators	Mean	STD
Traffic personnel provide clear and understandable information.	2.68	1.045
Traffic personnel effectively communicate changes in traffic regulations.	2.98	1.191
Public awareness campaigns by traffic personnel are informative and helpful.	2.85	.911
Traffic personnel use multiple platforms (e.g., social media, radio) to communicate with the public.	2.78	1.158
Traffic personnel are responsive to public inquiries and concerns.	3.07	1.438
Grand Mean	2.87	1.14

Source: Own Survey (2024)

The mean score for the clarity and understandability of information provided by traffic personnel is 2.68, with a standard deviation of 1.045, indicating that the information is perceived as not very clear and with moderate variability in opinions. The effectiveness of communicating changes in traffic regulations received a mean score of 2.98 and a standard deviation of 1.191, reflecting a close-to-average perception but with considerable variability in responses. Public awareness campaigns by traffic personnel were seen as moderately informative and helpful, scoring 2.85 with a standard deviation of 0.911, indicating more consistent responses but still below average satisfaction. The use of multiple platforms (e.g., social media, radio) for communication scored 2.78 with a standard deviation of 1.158, suggesting a slightly below-average perception with significant variability in opinions. The responsiveness of traffic personnel to public inquiries and concerns had the highest mean score of 3.07 and the highest standard deviation of 1.438, indicating a relatively more positive perception but with a wide range of experiences.

The overall grand mean of 2.87 and a standard deviation of 1.14 suggest that the communication by traffic services is perceived as slightly below average, with considerable variability in perceptions across all indicators. This implies several areas for improvement. There is a need to enhance the clarity and understandability of the information provided by traffic personnel. Training traffic personnel to communicate more effectively and using simpler language can improve public comprehension. Although communication of changes in traffic regulations is close to average, there is room for improvement through regular updates and clear notifications. Public awareness campaigns, while moderately helpful, could be made more impactful by utilizing engaging and informative content. The use of multiple communication platforms needs to be broadened and made more consistent to reach a wider audience effectively. Lastly, the relatively higher score for responsiveness to public inquiries is a positive aspect, but the high variability indicates inconsistent experiences, necessitating more timely and consistent responses to enhance public trust and satisfaction.

4.3.6. Respondents Perception on Professionalism of Traffic Personnel

The analysis of respondents' perceptions of the professionalism of traffic personnel in Addis Ababa, as detailed in Table 4.9, reveals a generally below-average perception across various indicators.

Table 4.9: Respondents Perception on Professionalism of Traffic Personnel

Indicators	Mean	STD
Traffic personnel conduct themselves in a professional manner.	2.57	.814
Traffic personnel are knowledgeable about traffic laws and regulations.	2.79	1.070
Traffic personnel are courteous and respectful in their interactions.	2.65	1.326
Traffic personnel handle situations calmly and effectively.	2.81	.963
Traffic personnel demonstrate integrity and ethical behavior.	2.89	1.132
Grand Mean	2.74	1.06

Source: Own Survey (2024)

As indicated in table 4.9 above, the mean score for the professional conduct of traffic personnel is 2.57, with a standard deviation of 0.814, suggesting that respondents perceive the professional conduct of traffic personnel as below average and with consistent responses. The knowledgeability of traffic personnel about traffic laws scored slightly better at 2.79, with a standard deviation of 1.070, indicating close-to-average perception but moderate variability in responses. Courtesy and respectfulness in interactions received a mean score of 2.65 and a standard deviation of 1.326, reflecting below-average perception and considerable variability in opinions. Handling situations calmly and effectively scored 2.81 with a standard deviation of 0.963, suggesting a close-to-average perception and moderate variability. Integrity and ethical behavior demonstrated by traffic personnel had the highest mean score of 2.89 and a standard deviation of 1.132, indicating a slightly better but still below-average perception, with moderate variability in responses.

The overall grand mean of 2.74 and a standard deviation of 1.06 suggest that the professionalism of traffic personnel is perceived as slightly below average, with moderate variability in perceptions across all indicators. This has several implications. Improving the professional conduct of traffic personnel through enhanced training and development programs can increase public trust and confidence. Ensuring continuous education and training can enhance the knowledgeability of traffic personnel regarding traffic laws, making enforcement more effective and credible. Emphasizing courteous and respectful communication through interpersonal skills training can improve public interactions and perceptions. Training programs focused on stress management and conflict resolution can help traffic personnel handle situations more effectively and calmly.

Although the perception of integrity and ethical behavior is slightly better, implementing strict ethical guidelines and reinforcing the importance of integrity can further improve public trust.

4.4. Level of Citizen Satisfaction with Traffic Services

The second specific objective of the study was to assess the citizen satisfaction with traffic services in Addis Ababa. The analysis of respondents' perceptions of their satisfaction with traffic services in Addis Ababa, as detailed in Table 4.10, reveals a generally slightly below-average level of satisfaction across various indicators.

Table 4.10: Level of Citizen Satisfaction with Traffic Services

Indicators	Mean	STD
Overall, I am satisfied with the quality of traffic services provided.	2.71	0.92
The traffic services meet my expectations.	2.69	1.06
I feel that traffic services have improved over time.	2.59	0.87
I am confident in the effectiveness of traffic management in ensuring safety and efficiency.	2.73	0.87
I believe that traffic services contribute positively to the overall functioning of the city.	2.57	0.96
I feel safe and secure while using the roads due to the presence of traffic services.	2.69	0.99
The responsiveness of traffic services to emergencies and incidents is satisfactory.	2.94	0.87
I find the information provided by traffic services to be useful and informative.	2.78	0.84
The professionalism of traffic personnel enhances my satisfaction with traffic services.	2.55	0.95
Overall, I am satisfied with the quality of traffic services provided.	2.57	0.91
Grand Mean	2.68	0.92

Source: Own Survey, (2024)

As can be seen from the above table, overall satisfaction with the quality of traffic services is rated at 2.71, indicating a slightly below-average perception with moderate consistency in responses. The ability of traffic services to meet expectations scored 2.69, showing significant variability in opinions and suggesting a gap between public expectations and service delivery. Perceptions of

improvement over time received a mean score of 2.59, reflecting a consistent belief that traffic services have not significantly improved. Confidence in the effectiveness of traffic management scored 2.73, indicating moderate confidence with consistent responses. The contribution of traffic services to the city's functioning was rated at 2.57, suggesting a below-average perception with moderate variability. Safety and security due to traffic services scored 2.69, indicating a slightly below-average feeling of safety. Responsiveness to emergencies received a relatively higher score of 2.94, showing more satisfaction with consistent responses. The informativeness of provided information was rated at 2.78, reflecting a slightly below-average perception. The impact of professionalism on satisfaction was rated at 2.55, indicating that professionalism slightly enhances satisfaction but remains below average. The overall grand mean of 2.68 with a standard deviation of 0.92 suggests a slightly below-average level of satisfaction with moderate variability across all indicators.

These results have several implications. Enhancing the overall satisfaction with traffic services requires addressing various aspects such as service quality and meeting public expectations. There is a need to bridge the gap between public expectations and service delivery, which can be achieved through better service design and delivery. Demonstrating significant and visible improvements over time through continuous improvement initiatives can positively influence public perception. Boosting confidence in traffic management effectiveness can be achieved by implementing effective strategies and communicating their impact. Increasing the positive contribution of traffic services to city functioning involves playing a more active and visible role in improving city life. Enhancing safety and security on the roads can involve improving traffic enforcement, road conditions, and public safety measures. The relatively higher satisfaction with responsiveness to emergencies is a positive aspect, but ensuring consistent and timely responses across all scenarios can further enhance public trust. Providing clearer, more comprehensive, and accessible communication from traffic services can improve the perception of the informativeness of provided information. Lastly, improving the professional behavior of traffic personnel can significantly enhance overall satisfaction. By focusing on these areas, policymakers can enhance the overall level of citizen satisfaction with traffic services in Addis Ababa.

4.5. Correlation Results

The third specific objective of study was to the relationship between different dimensions of traffic service quality and citizen satisfaction within the context of the Traffic Management and Control Department of the Addis Ababa City Administration. To test the strength of this relationship, correlation analysis was conducted on the primary data. The study used the interpretation guide by Marczyk et al. (2005), which categorizes the correlation values as follows: 0.00 to 0.19 indicates a weak or very low correlation, 0.20 to 0.39 indicates a low correlation, 0.40 to 0.59 indicates a moderate correlation, 0.60 to 0.79 indicates a high correlation, and 0.80 to 1.0 indicates a very high correlation. The correlation result is presented in Table 4.11.

Table 4.11: Correlation Traffic Service quality dimensions and Citizen Satisfaction

		Citizen Satisfaction
Accessibility	Pearson Correlation	.387**
	Sig. (2-tailed)	.000
Efficiency	Pearson Correlation	.504**
	Sig. (2-tailed)	.000
Safety	Pearson Correlation	.562**
	Sig. (2-tailed)	.000
Fairness in traffic enforcement actions	Pearson Correlation	.672**
	Sig. (2-tailed)	.000
Communication	Pearson Correlation	.764**
	Sig. (2-tailed)	.000
Professionalism of traffic personnel	Pearson Correlation	.667**
	Sig. (2-tailed)	.000
Citizen Satisfaction	Pearson Correlation	1
	Sig. (2-tailed)	
	N	294

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

Source: Survey data, (2024)

The study examines the relationship between various dimensions of traffic service quality and citizen satisfaction in Addis Ababa, the correlation results in Table 4.9 revealing significant correlations across all dimensions. The Pearson correlation for accessibility is 0.387, indicating a low to moderate positive relationship, suggesting that improved accessibility of traffic services is associated with higher citizen satisfaction, though the impact is relatively modest. Efficiency

shows a moderate positive correlation with a coefficient of 0.504, indicating that more efficient traffic management and response are moderately linked to higher satisfaction levels among citizens. Safety measures have a moderate correlation of 0.562, reflecting that enhanced safety enforcement and overall road safety positively influence citizen satisfaction to a moderate extent.

Fairness in traffic enforcement actions exhibits a high positive correlation with a coefficient of 0.672, highlighting that fair and impartial enforcement of traffic laws significantly enhances citizen satisfaction. Communication stands out with a very high correlation of 0.764, underscoring the crucial role of effective communication in traffic-related information and public responsiveness in driving citizen satisfaction. Lastly, the professionalism of traffic personnel shows a high positive correlation of 0.667, indicating that professional conduct, knowledge, and ethical behavior of traffic personnel significantly contribute to higher levels of satisfaction.

These findings align with previous studies emphasizing the importance of service quality dimensions in public satisfaction. For instance, Parasuraman et al. (1988) identified reliability, assurance, and responsiveness as critical factors in service quality, paralleling the high importance of communication and professionalism found in this study. Similarly, Zeithaml et al. (2002) highlighted the impact of efficient service delivery on citizen satisfaction, supporting the moderate correlation observed between efficiency and citizen satisfaction in Addis Ababa. The high correlation with fairness in enforcement is consistent with Tyler's (2006) work on procedural justice, which underscores that fair treatment by authorities significantly affects public perceptions and trust.

4.6. Analysis of Regression Results

The fourth specific objective of this study was to examine the various traffic service quality dimensions on citizen satisfaction, focusing on the Traffic Management and Control Department of the Addis Ababa City Administration. This investigation was conducted using regression analysis. Multiple linear regression relies on the assumptions of Ordinary Least Squares (OLS). When analyzing data with multiple regression, it is essential to ensure that the data meet these assumptions to yield valid results. Therefore, the following section includes the necessary diagnostic tests to confirm that the data are suitable for multiple regression analysis.

4.6.1 Assumptions/diagnostic test for multiple linear regressions

4.6.1.1 Multicollinearity Test

Multicollinearity, defined as very high inter-correlations among predictor variables, can make it difficult to compute unique estimates for a regression model (Myers, 1990). To assess the severity of multicollinearity among the explanatory variables in this study, the Variance Inflation Factor (VIF) was utilized. According to Field (2013), multicollinearity becomes a potential problem when the VIF value exceeds 4, and a serious issue when it exceeds 10. Table 4.12 presents the collinearity statistics for the predictor variables, indicating that all VIF values are within the acceptable range. These values suggest that there is no significant multicollinearity among the predictor variables, confirming that the independent variables are suitable for use in multiple regression analysis.

Table 4.12: Multicollinearity test for the Study Variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
Accessibility	.798	1.252
Efficiency	.594	1.683
Safety	.531	1.884
Fairness in traffic enforcement actions	.630	1.586
Communication	.483	2.070
Professionalism of traffic personnel	.579	1.728

Source: Survey Data, (2024)

4.6.1.2 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the errors varies across observations (Long & Ervin, 2000). Conversely, homoscedasticity is present when the variance of the residuals (error term) remains constant for all predicted values (Tabachnick & Fidell, 2007). The Breusch-Pagan test is commonly used to test for heteroscedasticity. This test examines the null hypothesis that the error variances are equal against the alternative hypothesis that the error variances are a multiplicative function of one or more variables. If the significance value is less than 0.05, the null hypothesis is rejected, indicating the presence of heteroscedasticity. Additionally, a chi-square value greater than 9.22 suggests heteroscedasticity (Sazali et al., 2010).

Table 4.13: Breusch-Pagan for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of citizen satisfaction
chi2(1) = 1.85
Prob> chi2 = 0.2480

Source: Survey Data, (2024)

In this study as indicated in Table 4.13, the significance value for the fitted values of the dependent variable, citizen satisfaction, was 0.248, and the chi-square value was 1.85. These results indicate that heteroscedasticity was not a concern.

4.6.1.3. Normality Test

Normality is an assumption in linear regression that presumes the residuals (errors) are approximately normally distributed. This study employed the Shapiro-Wilk test to determine whether the error term is normally distributed. According to Shapiro and Wilk (1965), the hypotheses for the normality test are as follows: the null hypothesis (H0) states that the error term is normally distributed, while the alternative hypothesis (H1) posits that the error term is not normally distributed. Using a significance level (α) of 0.05, the decision rule is that if the p-value is less than the chosen alpha level, the null hypothesis is rejected. Conversely, if the p-value is greater than the chosen alpha level, the null hypothesis that the data come from a normally distributed population cannot be rejected. The results of the Shapiro-Wilk test for normality are presented in Table 4.14.

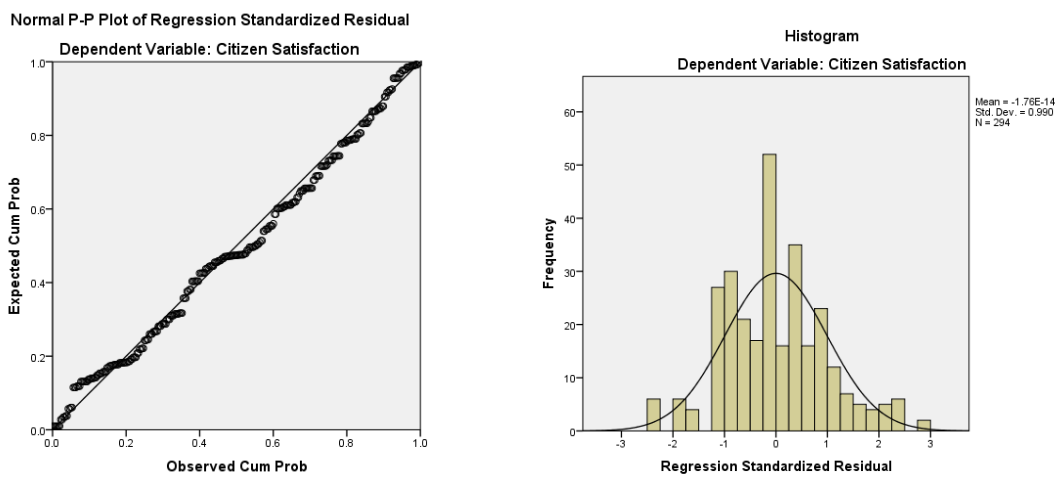
Table 4.14: Sharpiro and Wilk test for normality

Variable	Obs.	W	V	Z	Prob>z
Citizen Satisfaction	294	0.98333	1.895	1.568	0.1041

Source: Survey Data, (2024)

As indicated, the p-value for the fitted values of the dependent variable, citizen satisfaction, was 0.1041. This value is above the cutoff point of 0.05, indicating that the data are normally distributed. These results suggest that the residuals are approximately normally distributed, satisfying the normality assumption for linear regression.

However, since the test may be biased by sample size, as the test may be statistically significant from a normal distribution in any large samples. Thus, a or P-P Plot or histogram is required for verification in addition to the test (Asghar & Saleh, 2012). This is a graphical procedure that plots the cumulative probabilities (values range from 0 to 1) on the X-axis and the expected probabilities given the normal curve on the Y-axis. If the sample were exactly normally distributed, the points would lie on a straight diagonal line. The diagram below shows Normal P-P Plots for the dependent variables (citizen satisfaction) in which the points would lie on a straight line confirming the data was normally distributed.



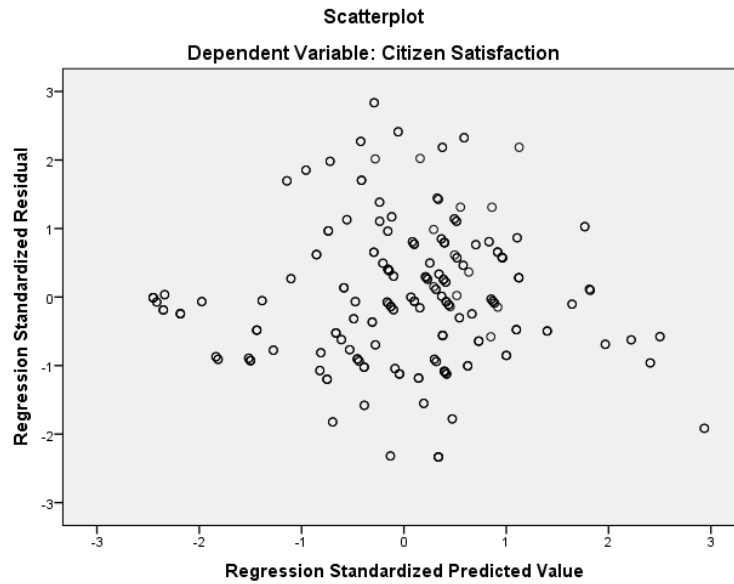
Source: Survey data, (2024)

Figure 4.1: Normal P-P Plot/Histogram for Normality Test

4.6.1.4 Linearity

The linearity assumption in multiple regression analysis posits that the dependent variable and each independent variable, as well as the dependent variable and the independent variables collectively, must exhibit a linear relationship (Asghar & Saleh, 2012). To assess linearity, a common approach involves creating scatter plots and visually examining them for linear patterns. A sign of linearity is observed when the scatter plot displays no discernible pattern, with points evenly distributed both above and below zero on the X-axis, and to the left and right of zero on the Y-axis. In this study, Figure 4.2 presents a scatter plot of studentized residuals against linearly predictive values, providing visual confirmation that the assumptions of linear regression are

satisfied. Particularly, the plot indicates the linearity of the relationship between the dependent and independent variables, as well as the constant variance of residuals.



Source: Survey Data, (2024)

Figure 4.2: Scatter plot for Linearity Test

4.6.1.5. Autocorrelation

The assumption of autocorrelation (serial correlation) is crucial in multiple regression analysis, assuming that the error terms are independent of each other. Autocorrelation occurs when there is a linear correlation between the error terms for different observations. One commonly used method to assess autocorrelation is the Durbin-Watson test. According to Cochrane (1997), if the Durbin-Watson statistic (denoted as "d") falls within the range of 1.5 and 2.5, it indicates the absence of autocorrelation. Therefore, the results of the Durbin-Watson test, presented in Table 4.15 below, demonstrate that there is no autocorrelation in the data.

Table 4.15: Durbin-Watson Test for Autocorrelation

Test	Dependent variable	Value
Durbin-Watson	Citizen Satisfaction	1.638

Source: Survey Data, (2024)

4.6.2 Result of Multiple Linear Regression

The primary aim of this study was to examine the impact of Traffic Service quality on citizen satisfaction within the framework of the Traffic Management and Control Department of the Addis Ababa City Administration. The independent variable, traffic service quality, is operationalized through six dimensions: accessibility, efficiency, safety, fairness in traffic enforcement actions, communication, and professionalism of traffic personnel. Consequently, the study aimed to assess the influence of each of these six dimensions of traffic service quality on citizens' satisfaction in Addis Ababa. The results of the regression analysis will be presented in the following section.

4.6.2.1. The Model Summary (Multiple Coefficient of Determination R^2)

In the model summary presented in Table 4.16, the coefficient of determination (R^2) is a key indicator explaining the percentage of variation in the dependent variable (citizen satisfaction) that is accounted for by all the independent variables (accessibility, efficiency, safety, fairness in traffic enforcement actions, communication, and professionalism of traffic personnel). The value of R^2 is 0.769, indicating that approximately 76.9% of the variability in citizen satisfaction can be explained by the combined influence of the independent variables in the model.

Table 4.16: Model Summary for service quality and the citizens' satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.877a	.769	.764	.325	1.538

a. Predictors: (Constant), Professionalism of traffic personnel, Accessibility, Efficiency, Fairness in traffic enforcement actions, Safety, Communication

b. Dependent Variable: Citizen Satisfaction

Source: Survey data, (2024)

Additionally, the adjusted R^2 , which considers the number of predictors in the model, is 0.764. This adjusted value is slightly lower than the R^2 but still provides a robust measure of the proportion of variation in citizen satisfaction explained by the independent variables, considering the model's complexity. The standard error of the estimate, which measures the average deviation of the observed values from the predicted values, is 0.325. This value indicates the accuracy of the model in predicting citizen satisfaction.

Overall, the model summary suggests that the included independent variables collectively have a substantial explanatory power in predicting citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. This implies that efforts to enhance accessibility, efficiency, safety, fairness in traffic enforcement actions, communication, and professionalism of traffic personnel are likely to positively impact citizen satisfaction with Traffic Services.

4.6.2.2. ANOVA Interpretation

The ANOVA analysis presented in Table 4.17 show joint significance of six traffic service quality and citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. The regression model constructed reveals a sum of squares of 100.765 with 6 degrees of freedom, resulting in a mean square of 16.794. In contrast, the residual sum of squares amounts to 30.243 with 287 degrees of freedom, leading to a residual mean square value of 0.105. The total sum of squares encompasses 131.008 with 293 observations.

Table 4.17: ANOVA for service quality and the citizens' satisfaction ^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	100.765	6	16.794	159.375	.000b
	Residual	30.243	287	.105		
	Total	131.008	293			

a. Dependent Variable: Citizen Satisfaction

b. Predictors: (Constant), Professionalism of traffic personnel, Accessibility, Efficiency, Fairness in traffic enforcement actions, Safety, Communication

Source: Own Survey, (2024)

The F-test conducted to assess the joint significance of the regression model unveils an F-value of 159.375 with a corresponding p-value of .000, denoted as Sig. This implies that the regression model is statistically significant, suggesting that the combination of independent variables significantly contributes to explaining the variance observed in citizen satisfaction. The predictors included in the model consist of the constant term, along with professionalism of traffic personnel, accessibility, efficiency, fairness in traffic enforcement actions, safety, and communication. In summary, the ANOVA results provide compelling evidence that the considered predictors exert a notable influence on citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration.

4.6.2.3. Regression Coefficients

Table 4.18 presents the coefficients for the relationship between Traffic Service quality dimensions and citizens' satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. According to the findings, all six independent variables (professionalism of traffic personnel, accessibility, efficiency, fairness in traffic enforcement actions, safety, and communication) that are considered in this study are significant in predicting the citizen satisfaction in Traffic Management and Control Department of the Addis Ababa City Administration since the p values are less than 0.05.

Table 4.18: Coefficients for Traffic Service quality and the citizens' satisfaction

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.288	.162		-7.937	.000
	Accessibility	.137	.055	.079	2.498	.013
	Efficiency	.139	.039	.130	3.541	.000
	Safety	.109	.040	.106	2.725	.007
	Fairness in traffic enforcement actions	.350	.045	.279	7.803	.000
	Communication	.440	.047	.383	9.381	.000
	Professionalism of traffic personnel	.235	.044	.200	5.361	.000

a. Dependent Variable: Citizen satisfaction

Source: Own Survey, (2024)

In this analysis, each coefficient represents the change in citizens' satisfaction for a one-unit change in the respective Traffic Service quality dimension, holding all other variables constant. The constant term, representing the baseline level of citizens' satisfaction when all Traffic Service quality dimensions are zero, is estimated at -1.288 with a standard error of 0.162 and a significant t-value of -7.937 ($p < .001$). When substituting the beta coefficients into the equation, the model becomes:

$$\text{Citizen Satisfaction} = -1.288 + (0.137 \times \text{Accessibility}) + (0.139 \times \text{Efficiency}) + (0.109 \times \text{Safety}) + (0.350 \times \text{Fairness in traffic enforcement actions}) + (0.440 \times \text{Communication}) + (0.235 \times \text{Professionalism of traffic personnel})$$

This equation allows us to predict citizens' satisfaction based on the values of the Traffic Service quality dimensions, with each coefficient representing the magnitude of the effect of the

corresponding predictor variable on the dependent variable, citizens' satisfaction, while holding all other variables constant. Regarding the Traffic Service quality dimensions and constant term:

- Constant term (-1.288): This represents the baseline level of citizens' satisfaction when all Traffic Service quality dimensions are zero. In other words, it accounts for factors not included in the model that may influence citizens' satisfaction.
- Accessibility exhibits a positive standardized coefficient (Beta = 0.079) of 0.137, indicating that an increase in accessibility is associated with a slight increase in citizens' satisfaction ($t = 2.498$, $p = .013$). For each unit increase in accessibility, citizens' satisfaction is expected to increase by 0.137 units, holding all other variables constant.
- Efficiency shows a stronger positive association (Beta = 0.130) with citizens' satisfaction, with a coefficient of 0.139 ($t = 3.541$, $p < .001$). A one-unit increase in efficiency is associated with a 0.139-unit increase in citizens' satisfaction, all else being equal.
- Safety also has a positive impact on citizens' satisfaction, with a coefficient of 0.109 ($t = 2.725$, $p = .007$). Each unit increase in safety leads to a 0.109-unit increase in citizens' satisfaction, assuming other variables remain constant.
- Fairness in traffic enforcement actions demonstrates the highest positive association (Beta = 0.279) with citizens' satisfaction, with a coefficient of 0.350 ($t = 7.803$, $p < .001$). An increase of one unit in fairness in traffic enforcement actions is predicted to result in a 0.350-unit increase in citizens' satisfaction, while other factors are held constant.
- Communication exhibits the strongest positive impact (Beta = 0.383) on citizens' satisfaction, with a coefficient of 0.440 ($t = 9.381$, $p < .001$). A one-unit increase in communication quality corresponds to a 0.440-unit increase in citizens' satisfaction, controlling for other variables.
- Professionalism of traffic personnel also significantly influences citizens' satisfaction, with a coefficient of 0.235 ($t = 5.361$, $p < .001$). Each unit increase in professionalism of traffic personnel is associated with a 0.235-unit increase in citizens' satisfaction, all other factors held constant.

Overall, these results suggest that improvements in all Traffic Service quality dimensions, particularly fairness in traffic enforcement actions, communication, and professionalism of traffic personnel, are associated with higher levels of citizens' satisfaction within the Traffic Management

and Control Department of the Addis Ababa City Administration. Among these dimensions, Communication and Fairness in traffic enforcement actions appear to have the strongest positive impact on citizens' satisfaction, followed by Professionalism of traffic personnel, Efficiency, Accessibility, and Safety.

4.7. Hypotheses Test and Discussion of Findings

The study investigated the effect of traffic service quality on citizens' satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. Traffic service quality was assessed using six dimensions: professionalism of traffic personnel, accessibility, efficiency, fairness in traffic enforcement actions, safety, and communication. The regression analysis results, summarized in Table 4.19, provide evidence for the acceptance of all the hypotheses presented in Chapter Two.

Table 4.19: Summary of Hypothesis Test

Hypotheses	Beta	T	Sig.	Decision	Remarks
Alternate (H1): Improved accessibility of traffic services leads to higher levels of citizen satisfaction.	.079	2.49	.013	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.
Alternate (H2): Greater efficiency in traffic management processes results in increased citizen satisfaction.	.130	3.54	.000	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.
Alternate (H3): Implementation of safety measures positively correlates with higher levels of citizen satisfaction.	.106	2.72	.007	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.
Alternate (H4): Enhanced communication strategies are associated with higher citizen satisfaction levels.	.383	9.38	.000	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.
Alternate (H5): Higher levels of professionalism among traffic personnel positively influence citizen satisfaction.	.279	7.80	.000	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.
Alternate (H6): Fairness in traffic enforcement actions positively influences citizen satisfaction.	.200	5.36	.000	Accepted	Its Sig. value is < 0.05 and Beta has a positive value.

Source: Own Survey, (2024)

The findings indicate that all six hypotheses were accepted, as the significance values were below 0.05, and the Beta coefficients were positive, demonstrating a significant positive relationship between each dimension of traffic service quality and citizen satisfaction.

H1: Improved accessibility of traffic services leads to higher levels of citizen satisfaction.

Accepted: The Beta value for accessibility was 0.079, with a t-value of 2.498 and a significance level of 0.013, hence accepted the hypothesis. This indicates that a one-unit increase in accessibility results in a 0.079-unit increase in citizen satisfaction, suggesting that enhancing accessibility to traffic services positively impacts citizens' satisfaction. Improved accessibility significantly enhances citizen satisfaction, which aligns with previous studies highlighting the importance of accessible services in public administration. This finding aligns with previous research emphasizing the critical role of service accessibility in public satisfaction (Zhang, 2009, Yang et al., 2021).

H2: Greater efficiency in traffic management processes results in increased citizen satisfaction.

Accepted: Efficiency showed a Beta value of 0.130, with a t-value of 3.541 and a significance level of 0.000, hence accepted the hypothesis. This suggests that every one-unit increase in efficiency leads to a 0.130-unit increase in citizen satisfaction. The result corroborating findings from other studies that highlight the importance of efficiency in service delivery (Singh & Prasher, 2020). Similarly, Research by Li et al. (2020) and Zhang et al. (2019) found that users value efficient traffic operations and are more satisfied with transportation services when they experience minimal delays and disruptions. The implication is clear that efficient traffic management significantly boosts public satisfaction.

H3: Implementation of safety measures positively correlates with higher levels of citizen satisfaction.

Accepted: The Beta value for safety was 0.106, with a t-value of 2.725 and a significance level of 0.007, hence accepted the hypothesis. This means that a one-unit increase in safety measures results in a 0.106-unit increase in citizen satisfaction. This result underscores the importance of safety in traffic management, which is critical for enhancing public satisfaction, as supported by studies in public safety and service quality (Manning et al., 2014; Liu & Wang, 2019). Studies by

Gao et al. (2019) and Wang et al. (2021) underscore the importance of safety measures, such as road signage, traffic signals, and enforcement of speed limits, in shaping user perceptions of traffic service quality and satisfaction. Furthermore, research by Chen et al. (2018) highlights the role of safety in promoting user trust and confidence in traffic authorities, emphasizing the need for robust safety measures to enhance overall user satisfaction and road safety outcomes.

H4: Enhanced communication strategies are associated with higher citizen satisfaction levels.

Accepted: Communication had a Beta value of 0.383, with a t-value of 9.381 and a significance level of 0.000, hence accepted the hypothesis. This indicates that a one-unit improvement in communication leads to a 0.383-unit increase in citizen satisfaction. Effective communication is vital for satisfactory service delivery, as also highlighted by recent studies in public administration (Chen et al., 2022). Research by Liu et al. (2020) and Zhou et al. (2017) supporting the assertion that effective communication is essential for satisfactory service delivery.

H5: Higher levels of professionalism among traffic personnel positively influence citizen satisfaction.

Accepted: The professionalism of traffic personnel had a Beta value of 0.279, with a t-value of 7.803 and a significance level of 0.000, hence accepted the hypothesis. This suggests that a one-unit increase in professionalism leads to a 0.279-unit increase in citizen satisfaction. Professional behavior in public service is crucial for enhancing satisfaction, aligning with findings from studies on service professionalism and public trust (Dahlgard-Park, 2011; Brown & Chin, 2020). Similarly, Zhou et al. (2017) found that professionalism, including the demeanor and competence of traffic personnel, significantly influences user perceptions of service quality and satisfaction levels.

H6: Fairness in traffic enforcement actions positively influences citizen satisfaction.

Accepted: Fairness in traffic enforcement had a Beta value of 0.200, with a t-value of 5.361 and a significance level of 0.000, hence accepted the hypothesis. This means that a one-unit increase in fairness results in a 0.200-unit increase in citizen satisfaction. Fair and equitable enforcement is fundamental to public trust and satisfaction, consistent with literature emphasizing the importance of fairness in public administration (Tyler, 2019). Similarly, Brown and Benedict (2002) found that

perceptions of procedural fairness, including the fairness and transparency of enforcement procedures, positively influence citizen satisfaction and trust in law enforcement agencies.

In conclusion, the results validate the hypothesized relationships between traffic service quality dimensions and citizen satisfaction, underscoring the significance of these factors in enhancing public satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of the study was the effect of traffic service quality on citizens' satisfaction in case of Traffic Management and Control Department of the Addis Ababa City Administration. In this chapter, the summary of findings, conclusions and recommendations of the study are discussed.

5.1 Summary of Findings

The study aimed to examine the effect of traffic service quality on citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. To achieve this objective, literature on traffic service quality models and citizen satisfaction was reviewed. A conceptual framework was developed using the Traffic Service Quality Model, which includes six service quality dimensions: professionalism of traffic personnel, accessibility, efficiency, fairness in traffic enforcement actions, safety, and communication as independent variables, and citizen satisfaction as the dependent variable. A survey questionnaire was designed based on this framework. A total of 384 questionnaires were distributed, and 294 completed questionnaires were returned and analyzed. The following findings were obtained from the analysis.

The study assessed citizens' perceptions of traffic service quality in Addis Ababa, focusing on six dimensions: accessibility, efficiency, safety, fairness, communication, and professionalism of traffic personnel. Using descriptive statistics, the findings revealed generally below-average perceptions across most dimensions, with a grand mean value of 2.77 indicating moderate dissatisfaction overall. Accessibility issues were highlighted, with significant variability in opinions about the ease of accessing traffic services and information (grand mean 2.73). Efficiency perceptions were also low (grand mean 2.61), indicating dissatisfaction with response times and traffic management processes. Safety measures were viewed as close to average (grand mean 2.95), but there is room for improvement in enforcing safety regulations consistently. Fairness in traffic enforcement was perceived poorly (grand mean 2.72), suggesting a need for more impartial and unbiased practices. Communication effectiveness was rated slightly below average (grand mean 2.87), with respondents noting variability in the clarity and responsiveness of traffic personnel. Lastly, the professionalism of traffic personnel was seen as below average (grand mean 2.74), with concerns about conduct, knowledgeability, and ethical behavior. These findings

underscore the need for significant improvements across all dimensions to enhance public satisfaction with traffic services in Addis Ababa.

The study also analyzed citizens' satisfaction with traffic services in Addis Ababa, revealing slightly below-average satisfaction across various indicators, with a grand mean of 2.68 and a standard deviation of 0.92. Overall satisfaction with service quality was rated at 2.71, while meeting expectations scored 2.69, indicating variability in public perceptions and a gap between expectations and service delivery. Perceptions of improvement over time scored 2.59, and confidence in traffic management effectiveness was 2.73, suggesting moderate satisfaction. The contribution of traffic services to city functioning was rated at 2.57, reflecting below-average perceptions. Safety and security due to traffic services scored 2.69, and responsiveness to emergencies received a relatively higher score of 2.94, showing more consistent satisfaction. The informativeness of provided information was rated at 2.78, and the impact of professionalism on satisfaction scored 2.55, indicating areas for improvement. These findings suggest that enhancing satisfaction requires addressing service quality, meeting expectations, demonstrating improvements, boosting confidence in management, improving safety, ensuring timely responses, and enhancing communication and professionalism.

The study also examined the relationship between traffic service quality dimensions and citizen satisfaction in Addis Ababa. Correlation analysis revealed significant positive relationships across all dimensions. Accessibility had a low to moderate correlation (0.387), efficiency a moderate correlation (0.504), and safety a moderate correlation (0.562) with citizen satisfaction. Fairness in traffic enforcement actions showed a high correlation (0.672), professionalism of traffic personnel also had a high correlation (0.667), and communication had a very high correlation (0.764) with citizen satisfaction. These findings highlight the critical role of fair enforcement, effective communication, and professional conduct in enhancing public satisfaction with traffic services.

The study investigated the influence of traffic service quality on citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration using multiple linear regression analysis. The findings revealed that approximately 76.9% of the variability in citizen satisfaction could be explained by the combined effect of six dimensions of traffic service quality: professionalism of traffic personnel, accessibility, efficiency, fairness in traffic enforcement actions, safety, and communication. The regression model was statistically

significant, indicating that the included independent variables collectively contribute significantly to explaining the variance observed in citizen satisfaction. Each dimension of traffic service quality was found to have a significant positive impact on citizen satisfaction, with improved accessibility, greater efficiency, implementation of safety measures, enhanced communication strategies, higher levels of professionalism among traffic personnel, and fairness in traffic enforcement actions all associated with higher levels of citizen satisfaction. These findings underscore the importance of addressing various aspects of traffic service quality to enhance public satisfaction and trust in traffic services within the Addis Ababa City Administration's Traffic Management and Control Department.

5.2 Conclusion

The study conducted an in-depth analysis of traffic service quality and citizen satisfaction within the Traffic Management and Control Department of the Addis Ababa City Administration. Accordingly, based on the findings presented in the above section, the researcher makes some conclusions concerning the relationship between traffic service quality dimensions and satisfaction of citizens in Traffic Management and Control Department of the Addis Ababa City Administration.

Overall, citizens in Addis Ababa have generally below-average perceptions of traffic service quality across various dimensions, including accessibility, efficiency, safety, fairness, communication, and professionalism of traffic personnel. These findings indicate significant room for improvement in the delivery of traffic services to meet the expectations and needs of the public. While slightly below-average, citizen satisfaction with traffic services in Addis Ababa still reflects some areas of consistency and moderate satisfaction, particularly in responsiveness to emergencies. However, there are notable gaps between public expectations and the perceived quality of service delivery, particularly in terms of meeting expectations, improvement over time, and the contribution of traffic services to the overall functioning of the city.

The study found significant positive correlations between various dimensions of traffic service quality and citizen satisfaction. Key factors such as fairness in enforcement, effective communication, and professionalism of traffic personnel were strongly associated with higher levels of satisfaction. Multiple linear regression analysis revealed that improvements in accessibility, efficiency, safety, fairness in enforcement, communication, and professionalism of

traffic personnel collectively contribute to higher levels of citizen satisfaction. This suggests that addressing these specific aspects of service delivery could significantly enhance overall citizen satisfaction with traffic services. These findings emphasize the importance of a holistic approach to improving traffic service quality to positively impact citizen satisfaction.

In conclusion, the study highlights the need for comprehensive reforms and targeted interventions within the Traffic Management and Control Department of the Addis Ababa City Administration to address the identified deficiencies in service quality and enhance citizen satisfaction with traffic services. By focusing on improving accessibility, efficiency, safety measures, fairness in enforcement, communication strategies, and professionalism among traffic personnel, policymakers can effectively meet the needs and expectations of the public, ultimately leading to a more satisfactory and efficient traffic management system in Addis Ababa.

5.3 Recommendation

Based on the major findings and conclusion of the study the following recommendations were forwarded;

- ➔ **Accessibility:** Enhancing accessibility to traffic services involves establishing easily accessible service centers in strategic locations across Addis Ababa. Additionally, investing in digital infrastructure to provide online platforms for accessing traffic-related information and services is essential. This could include developing user-friendly mobile applications and websites where citizens can easily access information, submit requests, and receive updates on traffic management.
- ➔ **Efficiency:** Improving the efficiency of traffic management processes requires streamlining administrative procedures and investing in technology to automate tasks wherever possible. Implementing advanced traffic monitoring systems and intelligent traffic control mechanisms can help optimize traffic flow and reduce congestion. Furthermore, providing comprehensive training programs for traffic personnel to enhance their skills in managing traffic effectively and responding promptly to incidents is crucial.
- ➔ **Safety:** Enhancing safety measures on the roads involves a multifaceted approach. This includes increasing enforcement of traffic laws to deter reckless driving behavior, improving road infrastructure to minimize accident-prone areas, and implementing public awareness campaigns to promote safe driving practices. Strengthening collaboration

between traffic authorities, law enforcement agencies, and community organizations can also facilitate more effective safety initiatives.

- ➔ **Fairness in Traffic Enforcement Actions:** To ensure fairness in traffic enforcement, it is essential to establish transparent procedures and guidelines for traffic enforcement actions. This includes providing clear criteria for issuing citations and penalties, conducting regular audits to monitor compliance with regulations, and implementing mechanisms for citizens to contest citations if they believe they were issued unfairly. Training programs for traffic personnel should emphasize the importance of impartiality and professionalism in their interactions with the public.
- ➔ **Communication:** Improving communication channels between traffic authorities and the public is vital for enhancing transparency and trust. This can be achieved by leveraging various communication platforms such as social media, email newsletters, and mobile alerts to disseminate timely information about traffic updates, road closures, and safety advisories. Establishing a dedicated hotline or helpline for citizens to report traffic-related issues and receive assistance can also facilitate more effective communication.
- ➔ **Professionalism of Traffic Personnel:** Enhancing the professionalism of traffic personnel requires ongoing training and development programs to improve their knowledge, skills, and ethical conduct. This includes providing training on customer service, conflict resolution, and cultural sensitivity to ensure respectful interactions with the public. Implementing performance evaluations and recognition programs can also incentivize traffic personnel to uphold high standards of professionalism in their roles.

By implementing these recommendations, traffic authorities in Addis Ababa can address the specific challenges identified in each dimension of traffic service quality and work towards enhancing overall citizen satisfaction with traffic services.

5.4 Area Further Research

Further research in the realm of traffic service quality and citizen satisfaction could explore several avenues to deepen understanding and address gaps in existing knowledge. Firstly, comparative studies across different cities or regions could help identify best practices and lessons learned from diverse contexts, informing evidence-based policy-making and implementation. Additionally, qualitative research methods such as focus group discussions and in-depth interviews could

complement quantitative analyses by capturing nuanced perspectives and experiences of both citizens and traffic personnel. This qualitative approach could uncover underlying factors influencing satisfaction levels and shed light on potential barriers to effective service delivery. Furthermore, exploring the impact of socio-economic factors, demographic characteristics, and cultural norms on citizen satisfaction with traffic services could provide valuable insights into disparities in service quality and inform targeted interventions to address equity concerns.

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Appendix I: Research Questionnaire

Addis Ababa University

School of Commerce

Dear respondents,

The purpose of this questionnaire is to collect data for post graduate study for Master of Art Degree in Supply Chain and Logistic Management Program in Addis Ababa University for the study entitled “**The Effect of Traffic Service Quality on Citizen Satisfaction: The Case of the Traffic Management and Control Department of the Addis Ababa City Administration**”. This questionnaire is required to assist in determining the objectives of the study. Your privacy will be kept anonymously and, therefore, no one knows who provided the information. Any information provided will be used for academic purpose only and will be treated in strict confidence. Therefore, you are kindly requested to provide your responses to different questions below. Thank you in advance for agreeing to participate in this study.

General Instruction: - Circle your response or indicate "√" in the box beneath for closed-ended questions among the provided alternatives. You don't need to write your name.

Part I- 1. Demographic profile of Respondents

1.	Sex:	Male <input type="checkbox"/>	Female <input type="checkbox"/>
2.	Age:	18 – 29 years <input type="checkbox"/>	41-55 years <input type="checkbox"/>
		30 - 40 years <input type="checkbox"/>	over 55 years <input type="checkbox"/>
3	Education level	Secondary school <input type="checkbox"/>	First Degree <input type="checkbox"/>
		Diploma <input type="checkbox"/>	Master & above <input type="checkbox"/>
4.	How long have you been residing in Addis Ababa?	Less than a years <input type="checkbox"/>	<input type="checkbox"/>
		1 - 5 years <input type="checkbox"/>	<input type="checkbox"/>
		6 – 10 years <input type="checkbox"/>	<input type="checkbox"/>
		More than 10 years <input type="checkbox"/>	<input type="checkbox"/>

Part II. Opinion Survey on the Center Service Quality

Below are Likert Scale items to measure Traffic Service quality regarding accessibility, efficiency, safety, fairness in traffic enforcement actions, communication, and professionalism of traffic personnel. Each statement can be rated on a 5-point Likert scale (**1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**).

SN.	Traffic Service Quality Dimensions	Rating scale				
		SA(5)	A(4)	N(3)	D(2)	SD(1)
	i) Accessibility					
1	Traffic information is easily accessible to the public.					
2.	Traffic Service centers are conveniently located.					
3.	It is easy to reach traffic personnel through various communication channels.					
4.	Traffic services are available at convenient times.					
5.	Traffic personnel provide timely updates on road conditions and traffic regulations.					
	ii) Efficiency					
1.	Traffic personnel respond quickly to incidents and emergencies.					
2.	Traffic management processes are well-coordinated and efficient.					
3.	Traffic personnel effectively manage traffic flow during peak hours.					
4.	The procedures for reporting traffic incidents are straightforward and efficient.					
5.	Traffic personnel reduce congestion effectively.					
	iii) Safety					
1.	Traffic personnel enforce safety measures consistently.					
2.	Road signage and signals are well-maintained and visible.					
3.	Traffic personnel presence increases my sense of safety on the roads.					
4.	Traffic personnel effectively enforce speed limits and other safety regulations.					
5.	Traffic personnel provide helpful safety tips and information to the public.					

SN.	Traffic Service Quality Dimensions	Rating scale				
		SA(5)	A(4)	N(3)	D(2)	SD(1)
6.	Fairness in Traffic Enforcement Actions					
	iv) Traffic personnel enforce traffic laws impartially.					
1.	I believe that traffic personnel treat all citizens equally.					
2.	The penalties imposed by traffic personnel are fair and appropriate.					
3.	Traffic personnel handle disputes impartially and professionally.					
4.	There is no discrimination in traffic law enforcement based on socioeconomic status.					
	v) Communication					
1.	Traffic personnel provide clear and understandable information.					
2.	Traffic personnel effectively communicate changes in traffic regulations.					
3.	Public awareness campaigns by traffic personnel are informative and helpful.					
4.	Traffic personnel use multiple platforms (e.g., social media, radio) to communicate with the public.					
5.	Traffic personnel are responsive to public inquiries and concerns.					
	vi) Professionalism of Traffic Personnel					
1.	Traffic personnel conduct themselves in a professional manner.					
2.	Traffic personnel are knowledgeable about traffic laws and regulations.					
3.	Traffic personnel are courteous and respectful in their interactions.					
4.	Traffic personnel handle situations calmly and effectively.					
5.	Traffic personnel demonstrate integrity and ethical behavior.					

Part III Measures of Citizen Satisfaction

1. Here are Likert Scale items to measure overall citizen satisfaction with traffic services. Each statement can be rated on a 5-point Likert scale (**1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree**):

	SA(5)	A(4)	N(3)	D(2)	SD(1)
1. Overall, I am satisfied with the quality of traffic services provided.					
2. The traffic services meet my expectations.					
3. I feel that traffic services have improved over time.					
4. I am confident in the effectiveness of traffic management in ensuring safety and efficiency.					
5. I believe that traffic services contribute positively to the overall functioning of the city.					
6. I feel safe and secure while using the roads due to the presence of traffic services.					
7. The responsiveness of traffic services to emergencies and incidents is satisfactory.					
8. I find the information provided by traffic services to be useful and informative.					
9. The professionalism of traffic personnel enhances my satisfaction with traffic services.					
10. Overall, I would rate my satisfaction with traffic services as high.					
11. Overall, I am satisfied with the quality of traffic services provided.					

Thank you for taking your time to answer this questionnaire!!!