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# Low Preference Towards the Use of Public Transport: A Case Study of Females of Lahore

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## Abstract

This study delves into the underlying reasons why women in Lahore prefer private vehicles over public transport, despite the latter being available. Comfort stands out as a major factor; private vehicles provide a level of comfort and security that public transport doesnt seem to. These factors collectively contribute to females' reluctance to use public transportation. The research identifies a few other interlinked issues that reinforce this trend. First, the inadequacy of public transport infrastructure suggests compelling hurdles for women. Second, concerns about harassment and safety instigate womens choice to avoid public transportation. Last, the shortage of public vehicles, which leads to overcrowding and unreliable service, further deters female passengers from using public transport. The quantitative methodology is used to understand the gravity of this issue through surveys. The sample for this study is 384 females from Lahore. For analysis, the research uses descriptive statistics, along with more advanced techniques such as regression analysis, hypothesis testing, and ANOVA, to explore the relationship between dependent and independent variables and to validate the studys hypotheses. The analysis was conducted using SPSS software. The study concludes by proposing approaches to address the challenges identified, suggesting potential solutions to improve public transport services for females in Lahore.

***Keywords****:* public transport, private vehicles, harassment and safety, transport preference, overcrowding

## Introduction

This study focuses on interpreting the key factors contributing to females low preference for public transport. To achieve this, the researcher conducted research involving females from Lahore. Public transport serves as a backbone for city infrastructure, offering efficient and accessible

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mobility for the population while being overseen by public or private operators. This system includes buses, trains, and taxis, which help the general public to move between or within the cities more efficiently. Public transport is essential for rising urban growth. For instance, according to study by Wang et al. (2025) the public transport system plays a crucial role in reducing traffic congestion by offering an alternative to private transport. Similarly, increased use of public transport significantly reduces carbon emissions and improves the overall environmental condition (Jing et al., 2022). Furthermore, the Global Public Transport Report of 2024 emphasizes that public transport use saves overall air quality (Advance Public Transport, 2024).

Although public transportation is widely recognized for its environmental benefits, including reducing air pollution and easing traffic congestion, many people still prefer using their own vehicles. This preference can be attributed to several negative factors that shape public perception of public transport. Key issues include inadequate infrastructure, leading to uncomfortable or inefficient travel experiences; harassment and safety concerns, particularly for women; and insufficient vehicle numbers, resulting in overcrowding and unreliable service. All in all, these problems contribute to a less enthusiastic view of public transport. As a result, it is not surprising that personal vehicles seem like a better and more effective mode of transportation for females.

The lack of a robust public transport framework substantially influences commuting experiences not only for females but also for everyone. Usually, bus seats are too narrow and poorly designed, failing to accommodate all individuals, particularly the physically impaired or even those with chronic health conditions (Field & Jette, 2007). Moreover, the air conditioning systems in these buses fail to provide much comfort. Malfunctioning air conditioning systems are to be found in some buses, while others have no operational air conditioning at all, leaving people sweating and suffocating in extreme weather (Cox, 2010). Punctuality is another major issue. Many public transport systems experience recurring delays, disrupting schedules and eroding public trust in their reliability. Research has shown that disorganization in scheduling and operational administration adds significantly to this problem, causing ample hindrance for commuters (Ebrahim et al., 2025). Cleanliness is also a significant concern. Public transport vehicles and facilities are rarely kept clean, including litter, dirt,

and obnoxious smells, which deeply affect the passenger experience and pose health risks. The distance between the bus stops adds another layer of complications to the public transport problems. More often than not, each bus stop is far from the next, requiring passengers to walk long distances or pass through unsafe, unstable areas to reach it. This lack of accessibility particularly affects women (Loukaitou-Sideris, 2014). The absence of protected waiting areas and accessible restrooms for female passengers reflects the ever-persistent issue of gender inequality in public transport infrastructure. The absence of such facilities not only creates a barrier to females using public transport but also actively deters them from doing so. This serves as an immense barrier limiting womens mobility and access to these services (Davis & Shaw, 2021). On the whole, these issues underscore the urgent need to improve public transportation to enhance convenience, security, and accessibility for women.

Recently, countless reports of harassment on public transportation have emerged. Harassment has become an important issue that needs to be addressed immediately and effectively. Public transportation users are deeply concerned about being harassed and its mental and physical impacts. This fear often leads to nervousness and a reluctance to use public transport, especially among women and marginalized groups (Loukaitou-Sideris, 2014). Unwanted staring, inappropriate gestures, and offensive body language, as a form of nonverbal harassment, are significant contributors to passenger discomfort. Nonverbal harassment contributes to the atmosphere of fear and stress, and research indicates these forms of harassment increase feelings of vulnerability in public spaces (Ali & Naz, 2016). The fear and risk of harassment and being on public transport surrounded by many men can heighten feelings of insecurity and discomfort. The threat of potential physical contact, intentional or not, is also a concern. According to many studies, being crowded in a small space, such as on public transport, may result in unwanted physical contact or a lack of personal space and may make people feel unsafe mentally, emotionally, and physically (Lombardi & Ciceri, 2021). All of the factors mentioned above highlight the urgent need to address harassment in public transportation and to implement effective policies to ensure the safety of public transportation users.

The lack of public vehicles is a major urban mobility issue. It also includes limited transport options, long waits, and severe overcrowding. Recent research indicates that as cities grow, public transport infrastructure

is not well-equipped to accommodate the large number of people. Therefore, resulting in inadequate services, ultimately decreasing customer satisfaction (Field & Jette, 2007). This issue becomes especially pressing during rush hour, when everyone is hoping to reach their destination immediately. The frequency of the services cannot keep up with demand (Downs, 2005). A study in New York found that commuters often wait more than 30 minutes during peak hours due to insufficient public transportation (Ebrahim et al., 2025). Additionally, overcrowding in vehicles is becoming increasingly common, causing extreme discomfort for passengers and posing a threat to their safety (Cox et al., 2006). This not only affects the individuals but also the efficiency of the transport system.

The benefits of public transportation, reduced carbon emissions, and reduced congestion come with many challenges that diminish the quality and function of public transportation. Poor infrastructure, safety hazards, and the number of vehicles reduce the quality of commuting and deter women from utilizing public transportation. A holistic strategy is required to improve the quality of public transportation and make it user-friendly. Improving public transportation must also address safety, infrastructure, and the number of vehicles to meet increasing urban needs. By making these changes, public transportation can truly fulfill its role in promoting sustainable urban growth and ensuring fairness for everyone. This will ultimately create a transport system that is more efficient, reliable, and inclusive, especially for women.

## Background of the Study

Public transportation is essential to economic development, environmental sustainability, and social equity. In the last few decades, Malaysias public transport system has immensely improved, ultimately highlighting a positive change in the countrys economic growth. Since gaining independence in 1957, Malaysias public transportation system has undergone incredible change. In the past, the public transport system mainly relied on bus and taxi services, and rail services were limited to the West Coast of Peninsula. Malaysias rapid rate of industrialization and urbanisation during the 1970s demanded a push for continuous upgrades and modernization of the transport system. The establishment of the Kuala Lumpur Light Rail Transit (LRT) in 1996 represented a major advancement in public transport development in Malaysia. The creation of the Land Public Transport Commission (Malay: Suruhanjaya Pengangkutan Awam

Darat, SPAD) in 2010 marked a significant milestone in the development of the country's public transport infrastructure. SPAD was set up to bridge public transport service gaps in the country in a more unified manner through planning and developing more cohesive transport systems across the country. Moreover, in recent years, the government has focused on improving urban mobility through the construction of the Mass Rapid Transit (MRT) and the expansion of the LRT network (Siang et al., 2025). Despite these advancements, Malaysias public transport system faces several significant challenges. One major issue is the coverage and accessibility of services. While major urban centers like Kuala Lumpur have relatively extensive public transport networks, rural and less-developed areas are still poorly served.

South Asian countries like India, Pakistan, Bangladesh, Nepal, Sri Lanka, and Bhutan offer a wide variety of public transportation services owing to differences in urbanization, policies, infrastructure, and economic conditions. In India, the public transport system has not kept pace with rapid urbanization and growth, and it faces numerous issues. According to James and Shete (2023) the public transport system often faces issues such as overcrowding, infrastructure constraints, and disorganization. For instance, the Indian Railways, the largest rail network in the world, struggles with outdated systems and regularly faces delays, affecting the quality and efficiency of the network. In big cities like Mumbai and Delhi, bus services face the same issues. Despite these challenges, positive changes have also occurred, such as the development of metro systems in cities like Delhi, Bangalore, and Hyderabad.

Pakistans public transport system is outdated and insufficient for its population. Pakistans public transport system does not meet the standards outlined by the Asian Development Bank since it is particularly ineffective and inefficient. The countries rely mainly on rickshaws, old and poorly maintained buses, and minibuses. According to the ADB (2015) report, a lack of investment in new infrastructure and upkeep of existing ones has led to frequent breakdowns and unreliable service. Urban areas in Pakistan face significant challenges with public transport, particularly in cities like Karachi, Lahore, and Islamabad. In Karachi, the lack of an organized mass transit system exacerbates traffic congestion, leading to longer travel times and increased pollution. The Karachi Mass Transit Project is intended to ameliorate this situation and plans to develop a modern transport system,

but it is already facing administrative and financial delays and challenges (Heraa, 2013).

Lahores Metro Bus Service, introduced in 2013, has undoubtedly enhanced transportation services; however, it covers only limited areas and often operates with low capacity, leading to overcrowding and reduced service quality (Tabassum et al., 2017).

Public transport in Pakistan faces infrastructure gaps, operational inefficiencies, socio-economic challenges, and environmental issues. There have been improvements to formal public transport systems and even innovative efforts in some cities, notably the Lahore Metro Bus, yet the major public transport issues remain unresolved. A holistic approach involving a significant increase in transport infrastructure investment, systematic transport coordination, and regulatory frameworks, along with the use of sustainable and innovative transport technologies, is needed. It is required to establish safe, reliable, efficient, and equitable systems that respond to economic development needs and improve the everyday lives of citizens in Pakistan.

## Problem Statement

Many women in Lahore seem to care little about worsening air pollution and traffic congestion. The lack of interest poses a significant challenge for transportation policymakers and practitioners, underscoring the need to understand why women do not use public transportation and to devise ways to build ridership among women and, consequently, reduce congestion. Identifying the root causes of this low preference is crucial to creating solutions that make public transport more attractive to females.

The aim of this study is to examine the factors behind womens limited use of public transportation in Lahore, to uncover the causes behind this reluctance, explore potential improvements, and suggest practical recommendations. The findings' aim is to inform targeted strategies that encourage and promote public transport adoption by females, improve the transportation experience, and contribute to a more sustainable and efficient urban system.

## Research Hypothesis

H1: There is a noteworthy association between inadequate infrastructure of public transport and low preference of women towards the use of public

transportation.

H01: There is no significant connection between inadequate infrastructure of public transport and low preference of women towards the use of public transportation.

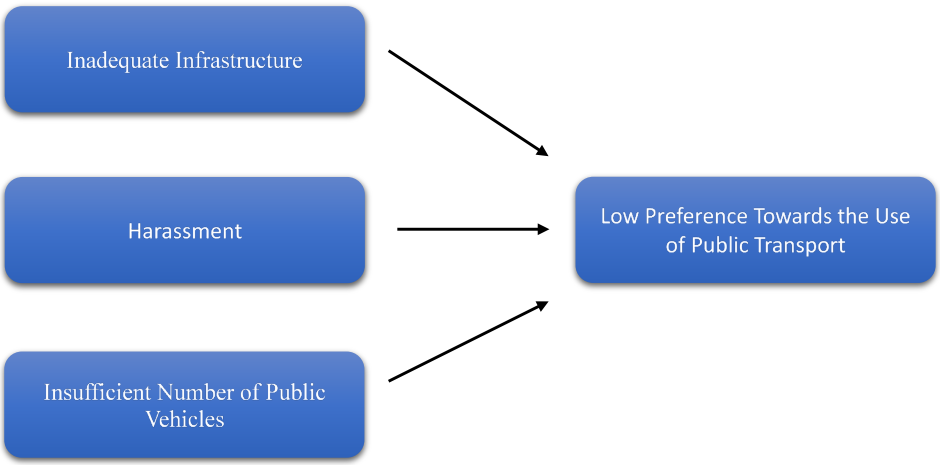
H2: There is a significant relationship between harassment in public transport and low preference of females towards the use of public transport.

H02: There is no significant relationship between harassment in public transport and low preference of females towards the use of public transport.

H3: There is a significant relationship between the shortage of public transport and the low preference of females towards the use of public transport.

H03: There is no significant relationship between the shortage of public transport and the low preference of females towards the use of public transport.

**Figure 1**
*Research Framework*




## Significance of the Study

The goal of this study is to identify the primary causes of the decreased use of public transportation by many females. Additionally, it bridges gaps in the existing research and establishes a foundation for further studies on this subject. The study will examine the main causes of females' reluctance

to use public transport and offer practical recommendations to help policymakers improve these services and make them easier to use.

This study examines the primary barriers preventing women from using public transport, with an emphasis on harassment, inadequate infrastructure, and a lack of services. It aims to provide practical information to support the development of more effective and responsive transport regulations, enhance service quality, and address the specific needs and concerns of female travelers.

## Literature Review

People in low-income countries rely on a variety of modes of transportation for their mobility. However, there is a noticeable transition where public transportation, which was once a primary means of travel, is seeing a decline in usage. The primary reason is the rising number of private vehicles on the roads, which are increasingly dominating the transportation landscape (Gutfreund, 2004).

In addition, over the last few decades, global mobility has increased significantly, leading to higher levels of car use worldwide and contributing to heightened concerns about traffic congestion and pollution. With these concerns and issues in mind, it is essential to note the changing social structures and lifestyle trends that diversify travel needs and influence transportation planning and policy-making. Most people have adapted themselves to new lifestyles in which car travel is an integrated part of daily life.

Additionally, a key criticism of public transport is that it lacks the flexibility that a private vehicle driver has. A car driver can take any route and even change routes when they anticipate delays or wish to optimize their travel time. In contrast, public buses are confined to predetermined routes and lanes, which limits their ability to adapt themselves to unexpected circumstances or traffic conditions. Consequently, this inflexibility can be a significant deterrent for potential passengers. Furthermore, there is a perception among the general traveling public that public transport isnt reliable and that commuters waste their time when they choose it. This perception highlights the need for public transport policies to prioritize enhancing the reliability and efficiency of public transit systems. If transit agencies adopt a framework to improve reliability and efficiency, the public could gain a better perspective and view public

transport as a more appealing mode of transportation.

## The Role of Public Transportation in Sustainable Urban Development

An efficient public transportation system is essential to creating a livable, accessible transportation network in cities. Yet global data indicate that this trend has sharply declined in recent years, particularly in developing countries, suggesting a troubling trend: the share of public transportation in urban centers has been steadily declining. This decline generates a noteworthy concern that deserves careful examination (Gutfreund, 2004).

Environmental concerns are important in determining transportation modes, whether by bus or by car. Comparing pollution levels, buses produce less pollution per capita compared to cars. Among the different types of road-based passenger transportation, buses are more efficient; they occupy less road space and generate less pollution per passenger-kilometer than individual cars. Therefore, transport policies should place special emphasis on enhancing and promoting bus transport systems to achieve a more sustainable and eco-friendlier urban environment (Anwar, 2009).

Investment in public transportation is widely recognized as a pivotal strategy for decreasing reliance on private vehicles and mitigating the adverse effects of the automobile use on both the environment and society. By investing in a strong, effective public transit system, cities can significantly reduce the adverse effects of personal driving, including air pollution, congestion, and greenhouse gas emissions. Additionally, developing public transport infrastructure supports the transport system in promoting sustainable development within urban areas, contributing to more eco-friendly and socially equitable urban environments (Miller et al., 2016).

## Enhancing Public Transportation to Reduce Car Dependency

Since the beginning of the 21st century, China has introduced a comprehensive array of policies and regulations to emphasize the development of public transportation (PT). According to the preliminary data, this includes six central regulations and approximately 230 local regulations. Consequently, the strategic emphasis on PT development has led to significant advancements in the sector. For instance, there were 566,000 urban public transport vehicles in 2018 compared to 372,000 in 2008, and the number of routes in use nearly doubled during that time. Even

so, many locals continue to shun public transport due to its unsatisfactory service, lengthy commutes, and lack of comfort (Zhang et al., 2021).

People often prefer to travel in comfort, which means having a seat, a pleasant atmosphere free from unpleasant smells, plenty of personal space, and a smooth ride. Although it is well known that bus travel is more economical than car travel, the general public still prefers cars over buses. This indicates that the quality of service bears greater significance than the cost of travel.

Improving the effectiveness and quality of public transportation is crucial to altering peoples daily travel patterns. Governments are being pressured to implement sustainable transport policies owing to the growing urban congestion and its immediate and long-term climate impacts. Understanding the general publics needs and preferences , as well as the significant determinants of their decision to use public transport, it is essential to the effectiveness of these policies. This also involves identifying and focusing on particular user groups: current or potential, that would benefit the most. The ultimate goal of these initiatives is to improve service quality and increase public transports appeal to broader demographics.

**Role of Inadequate Infrastructure in Hindering Public Transportation Users**

Ineffective public transport infrastructure fails to meet the populations mobility needs in an efficient and safe manner, often characterized with poor coverage, outdated technology, inadequate maintenance, and poor integration between modes of transport. These shortcomings contribute to worsening traffic congestion, extended commute times, environmental harm, and reduced access to essential services, impacts that are felt most severely by low-income and marginalized communities. Addressing these issues requires substantial investment in modernizing infrastructure, enhancing service quality, and ensuring systems which are capable of meeting both present and future demand (Aguero et al., 2017).

The challenges associated with low-quality public transportation services stem from a range of factors, including limited space, unreliable schedules, and poorly maintained infrastructure. Such conditions not only reduce the convenience and appeal of public transport but also contribute to passenger dissatisfaction and discourage consistent use, ultimately undermining the system's effectiveness and sustainability (Gutfreund,

2004). Further, another researcher emphasizes the effects of these deficiencies on various aspects of the travel experience, including increased in-vehicle travel time, higher levels of crowding, and prolonged waiting times. The ineptness of the public transportation system to fully meet users quantitative and qualitative needs is a major contributor to the decline in public transport use (Sahu et al., 2018).

Furthermore, a study showed that passenger satisfaction relates to the value of station services, bus conditions, and the drivers behavior. All of these factors influence peoples satisfaction with public transport, regardless of urban and socio-economic differences. Also, the overall quality of a public transport system is influenced by multiple factors, such as vehicle comfort and safety, the time taken along bus routes, and passenger convenience. Other influential elements include the cost of the service, as well as the symbolic, soft, and functional dimensions of service quality, all of which are supported by the necessary infrastructure.

As a result, the current state of public transportation does not yet offer a high enough quality of service to attract a significant number of car users to transition to using public transport. To encourage greater public transport usage, it is essential to enhance its image while simultaneously making the system more competitive and appealing. Achieving this requires comprehensive improvements in service quality, which can only be realized by thoroughly understanding passengers travel behavi ors, needs, and expectations. Therefore, it is crucial to assess service levels to pinpoint the strengths and weaknesses of the public transport system. This evaluation will be helpful in public transport management, guiding them in making the necessary improvements to satisfy passengers and increase market share. However, developing appropriate and accurate measures to evaluate service quality in a transport system is difficult, primarily because it requires understanding human behavior and attitudes. That is why, it is essential to identify and measure the various kinds of service quality which passengers expect from the public transportation system.

To improve public transport services, service providers need to understand the service attributes that are important to both existing and potential users. Reliability is perhaps the most important service attribute, and in particular, the services punctua lity. Reliability affects passengers confidence, and the less reliable the service, the less public transport they will use. Other important attributes include the frequency and comfort.

Users highly value these factors which are essential for encouraging more people to choose public transport. Conversely, negative characteristics such as extended travel times and high fare levels have been found to detract consumers from satisfaction. Moreover, vehicle condition, including cleanliness, is another crucial aspect that significantly impacts the user experience. Therefore, to foster greater public transport usage, these attributes should be carefully considered and prioritized in service planning and improvement efforts.

From the above discussion, it can be concluded that people generally like cars better than buses because of the lack of quality of service by buses. To compete with the car, the bus service must deliver the quality-of-service consumers expect. Most people like to drive, so it is necessary to identify the underlying reasons they enjoy driving. Thus, it may be possible to encourage them to switch to public transport.

**The Impact of Perceived Safety on Public Transportation Usage**

Perceptions of travel safety refer to the awareness and judgment travelers exercise when considering the risks and emotional factors associated with using public transportation. Moreover, research on travel safety perceptions suggests that some user groups modify their travel habits to avoid situations they perceive as potentially dangerous or threatening to their personal security. These modifications may include avoiding certain routes, times of travel, or modes of transport, depending on the perceived safety risk (Loukaitou-Sideris, 2014).

Additionally, specific demographics, particularly women of all ages, both younger and older, tend to place greater emphasis on travel safety perceptions than men. Research from diverse countries and transportation systems consistently supports this finding, indicating that women are generally more cautious about their safety while traveling. This heightened awareness and consideration of potential risks reflect a stronger tendency to evaluate and prioritize personal security than their male counterparts (Vanier & de Jubainville, 2017).

Moreover, when travelers experience fear or insecurity during their journeys, the impact of these incidents can be substantial. Such experiences may not only shape their overall perception of service quality but also influence their outlook on personal safety. Travelers often rely on implicit expectations to assess the likelihood of encountering critical incidents while

using public transport. When these expectations are not met, it can significantly affect their willingness to use public transport in the future. A professional, trustworthy service, including customer-friendly, capable staff, comfortable, clean vehicles, and hospitable waiting zones, can meaningfully reduce travelers perceived need to a ssess potential risks. Providing factual information further reinforces the sense of helping to alleviate ambiguity, increase security, and reduce fear. On the other hand, poor quality of service can intensify travelers' risk perceptions, leading to an increase in anxiety and greater concern for private/personal safety.

Public observations of security and safety significantly affect the probability of using public transport. Fear of crime or harassment, particularly amongst vulnerable groups like women, can meaningfully prevent people from using public services. This sense of uneasiness drives individuals to choose alternative means of transportation in an effort to avoid situations in which they feel insecure or in danger (Ceccato & Newton, 2015).

**Impact of Insufficient Public Vehicles on Public Transportation Usage**

A study in 2023 by the International Transport Forum brought the spotlight to the broad gap between vehicle accessibility and the increasing demand for passenger conveyance, a trend that is powering traffic congestion and growing dependence on private transportation. The examination emphasizes the urgent need for deliberate planning and investment in public transportation to keep pace with the speedily expanding population in urban settings. The report advises that without addressing this disproportion, urban centers will face worsening congestion, greater ecological impacts, and more profound social inequalities, as those deprived of access to private transportation risk being marginalized in terms of mobility and opportunities (Power, 2012).

The lack of suitable transportation options is a substantial barrier to convenience and social inclusion, particularly in rural and low-density areas, where limited facilities amplify the risk of social segregation. With time, particular social inclinations have added to mobility in these areas. One key factor is the decline in population due to urbanization, which has led to the loss of numerous basic amenities. This results in those who stay in these zones having to travel even longer distances to reach the limited facilities still available to them (Berg & Ihlström, 2019).

Compared to the residents in urban settings, those in rural settings often face isolation owing to the lack of accessible transportation. This dearth of access creates barriers to essential basic services such as education, healthcare, and shopping, and limits opportunities for social interaction and communal engagement. The consequences can be far-reaching, distressing not only families financial well-being but also the emotional and social well-being of rural inhabitants. For example, incline towards the view that access complications, including the limited availability of service, long service distances, and a lack of public transportation, make rural inhabitants experience greater difficulties. Such factors jointly contribute to a lower quality of life of the ones compared to those in urban areas, where transportation services are more readily available.

## Research Gap

Previous studies have shown that various factors influence peoples opinions and use of public transit, including service quality, safety, fares, accessibility, comfort, and reliability. These variables significantly affect peoples travel habits and choices regarding public transportation. However, most research has evaluated the general population rather than focusing specifically on gender-based disparities.

In particular, there is a lack of research examining womens perceptions of public transit. Women often face issues such as safety concerns, harassment, and discomfort, which may influence their preferences and travel choices differently than men. Despite these challenges, many gender-specific issues remain underexplored in existing public transit studies.

Additionally, while numerous studies have been conducted in different urban environments around the world, no empirical research has focused on female perceptions of public transport in the city of Lahore. Owing to Lahores unique socio-cultural context, population density, and transport infrastructure, findings from other cities or countries cannot be generalized to this setting.

Therefore, this study aims to fill the existing gap by examining the factors that impact womens preferences and perceptions of public transport in Lahore. By concentrating exclusively on women in this city, the research will provide new insights to the literature and context-specific evidence that can assist policymakers and transport authorities in designing effective, gender-sensitive transport policies.

## Methodology

### Research Design

Quantitative data for this study were collected using closed-ended questions posed to females in Lahore. Using closed-ended questions helps expand the scope of information collected and minimizes potential bias more effectively than open-ended questions. The data processing and analysis ensured adherence to validity and reliability standards.

### Research Paradigm

This study is guided by the positivism to examine females perceptions towards the use of public transport in Lahore. Consequently, this research employs explanatory research to examine the behavior of females and their perceptions of public transport use. This approach is most compatible with this research, as this study focuses on understanding the cause-and-effect relationship between females perception towards the use of public transport and various variables that affect their perceptions and behaviours. The research type is quantitative in nature, so, using a naturalistic approach, a survey questionnaire was employed as an effective method for data collection. This method facilitates the construction of meaningful reality and yields effective and adequate results. Therefore, the perceptions of females regarding the use of public transport were examined within this paradigm, which the researcher selected as the studys framework within a quantitative approach.

### Sampling Strategy

In this study, the researcher used restricted probability sampling, focusing exclusively on female respondents from Lahore.

### Population of the Study

For this study, the population consists of 6,118,958 females from Lahore, Punjab, Pakistan.

### Unit of Analysis

The unit of analysis in research is the core entity upon which the study is built and its findings are based. It refers to the specific entity, level, or unit at which observations and measurements are conducted. This fundamental concept is crucial for guiding researchers in defining what exactly is being studied and analyzed. In quantitative research, the unit of

analysis typically corresponds to the level of measurement used for variables, such as individuals for person-level analysis or organizations for organizational-level analysis. The choice of unit of analysis significantly affects the generalizability and relevance of the research findings. Therefore, researchers must carefully define and justify their choice, taking into account both the research questionnaire and practical constraints. In this study, the unit of analysis is female residents of Lahore.

**Sample Size**

According to Krejcie and Morgans Table, the sample size for this study is 384 females from Lahore, given that the current female population in Lahore is 6,118,958.

**Data Collection**

As the researcher moved into the data collection phase, the main goal was to obtain valuable insights into female perspectives on public transport usage. With the questionnaire finalized, a distribution plan was developed to reach the target audience effectively. This involved collaborating with school, college, and university students, as well as working women, to ensure a diverse and representative sample. Ethical considerations were a top priority, ensuring voluntary participation and obtaining informed consent from each participant.

Distribution methods were customized to accommodate the convenience and preferences of female participants. These methods include electronic surveys sent via email, online survey platforms, and physical copies distributed in person. In this study, the researcher used both approaches: an online questionnaire was distributed to females in Lahore, and some surveys were completed in person. To ensure clarity and ease of response, detailed instructions were provided on the survey questionnaire. The electronic surveys were designed to be user-friendly and accessible across various devices, ensuring participants could complete them at their convenience. Online survey platforms were selected for their ability to efficiently reach a broad audience.

After the data collection period concluded, the researcher reviewed the responses to ensure completeness and consistency. Subsequently, statistical analyses were planned to identify meaningful patterns and insights, providing a solid foundation for drawing conclusions and recommending future policies. Once data quality was confirmed, various statistical

techniques, including descriptive and inferential statistics, and content analysis, were employed. These analyses aimed to uncover trends, correlations, and other significant findings within the data. The insights gained from these analyses were crucial in understanding the factors influencing females use of public transport and their overall experiences and preferences.

Throughout this process, the researcher prioritized ethical considerations, transparency, and participant confidentiality. By adhering to these principles, the researcher ensured the integrity of the study and built trust with the participants, both of which were crucial for obtaining honest and reliable data.

**Data Analysis**

Descriptive statistics summarize and present data meaningfully, while inferential statistics enable researchers to generalize from a sample to a population. Techniques such as regression analysis, hypothesis testing, and ANOVA (Analysis of Variance) are used to determine relationships among variables and test hypotheses. Content analysis involves coding and categorizing textual or visual data systematically to identify patterns and themes. This method is helpful in analyzing large volumes of text and can be applied to various forms of communication, such as interviews, open-ended survey responses, and media content (Miles et al., 2014).

## Findings

Cronbachs alpha is a statistical index used to evaluate the internal consistency or reliability of a set of scale or test items. The Cronbachs alpha in this study is 0.900, which is excellent and indicates that the 23 items are highly intercorrelated. Thus, the data collected using these variables can be considered reliable and dependable.

**Table 1**

*Descriptive Statistics (N = 384)*

| Variable | Mean | Median | Mode | Std. deviation |
|---|---|---|---|---|
| Inadequate Infrastructure | 3.761 | 3.857 | 4.000 | .519 |
| Harassment | 4.099 | 4.000 | 4.0 | .556 |
| Insufficient Number | 3.680 | 3.750 | 4.00 | .555 |
| Low Preference | 3.800 | 4.000 | 4.000 | .5895 |

Table 3 presents the average mean values for both the dependent and independent variables in the study. The values of mean, fluctuating from 3.761 to 4.099, specify that the maximum respondents agree that the independent variables, harassment, inadequate infrastructure, and availability of public vehicles, pointedly impact women's perceptions of using public transportation.

This proposes that participants trust these aspects, which play a vibrant role in shaping their vision on the reliability, safety, and overall efficiency of public transport. The relatively high mean values highlight the importance of addressing these issues to improve public transportation services and make them more accessible to women. These results emphasise the need for targeted interventions and strategies intended to reduce these adverse effects and enhance the general experience of female travellers.

**Regression Analysis**

Regression analysis is an influential statistical method used to inspect and measure the association between a dependent variable and one or more independent variables. It permits us to comprehend how variations in the independent variables influence the dependent variable. The results of a regression analysis are typically offered in three main tables: the model summary, the ANOVA table, and the coefficients table.

**Table 2**
*Model Summary*

| $R$ | $R^2$ | Adjusted $R^2$ | Std. Error |
|---|---|---|---|
| .575[a] | .331 | .319 | .4866 |

The $R^2$ value, also known as the coefficient of determination, represents the percentage of variance in the dependent variable that can be explained by the independent variables. In this study, an $R^2$ value of 0.331 indicates that a lack of public vehicles, harassment, and inadequate infrastructure combined explain 33.1% of the variation in the preference for using public transport.

According to Table 2, the $R^2$ value of 0.331 indicates that 33.1% of the variation in the dependent variable, low preference for public transport, is explained by the independent variables: harassment, inadequate infrastructure, and a lack of public vehicles.

**Table 3**

*ANOVA*

| Model | Sum of Squares | *df* | Mean Square | *F* | Sig. |
|---|---|---|---|---|---|
| Regression | 44.074 | 7 | 6.296 | 26.581 | .000[b] |
| Residual | 89.063 | 376 | .237 | | |
| Total | 133.138 | 383 | | | |

***Note.*** Dependent Variable: Low Preference. Predictors: Insufficient number, Income, Age, Harassment, Employment Status, Education Level, Inadequate infrastructure

Table 3 presents the results of the ANOVA analysis, where the p-value is reported as $p < 0.001$. Since the *p*-value is well below the standard threshold of 0.05, it confirms that the relationship between the dependent variable and the independent variables is statistically significant. Specifically, the dependent variable in this study is the low preference for using public transport. The independent variables include inadequate infrastructure, harassment, and an insufficient number of public vehicles. This significant *p*-value suggests that these independent factors collectively have a meaningful impact on individuals preferences for public transportation. In other words, inadequate infrastructure, experiences of harassment, and the scarcity of public transport options are all contributing factors that significantly influence why females may prefer not to use public transportation.

**Table 4**

*Coefficients*

| | *B* | Std. Error | β | *t* | Sig. |
|---|---|---|---|---|---|
| (Constant) | 1.419 | .278 | | 5.103 | .000 |
| Age | .013 | .037 | .016 | .353 | .725 |
| Education Level | -.103 | .033 | -.145 | -3.085 | .002 |
| Employment Status | -.072 | .034 | -.100 | -2.148 | .032 |
| Income | .016 | .039 | .018 | .400 | .689 |
| Inadequate Infrastructure | .358 | .061 | .315 | 5.854 | .000 |
| Harassment | .138 | .053 | .131 | 2.613 | .009 |
| Insufficient Number | .242 | .052 | .228 | 4.640 | .000 |

Table 4 presents the results of the coefficient analysis. According to the table, the β coefficient for the first variable, inadequate infrastructure, is 0.315. This implies that for each one-unit increase in inadequate infrastructure, there is a corresponding increase of 0.315 units in the low preference for using public transport. This means that inadequate infrastructure is associated with a higher reluctance to use public transportation.

The beta coefficient for the second variable, harassment, is 0.131. This shows that every one-unit increase in harassment leads to a 0.131-unit increase in low preference for public transport. Thus, more levels of harassment are associated with a greater reluctance to use public transport.

Likewise, the β coefficient for the third variable, insufficient number of public vehicles, is 0.228. This demonstrates that a rise of one unit in the insufficient number of public vehicles results in an increase of 0.228 units in the low preference for using public transport, indicating that the insufficient number of public vehicles is associated to a greater disinclination to use public transportation.

Furthermore, the positive beta values for all three variables indicate a direct relationship between low public transportation preference and inadequate infrastructure, harassment, and an insufficient number of public vehicles. In other words, as these problems increase, individuals inclination to avoid public transportation increases.

The results of the regression analysis show that all three independent variables have a significant impact on females' low preference for using public transport. Inadequate infrastructure was identified as an important factor, indicating that poor transport facilities, lack of comfort, and unreliable services increase women's reluctance to use public transportation. Likewise, harassment was also found to significantly influence females' transport preferences, suggesting that safety concerns and fear of inappropriate behaviour discourage women from relying on public transport. Furthermore, the insufficient number of public vehicles was shown to significantly affect low preference, as limited availability, overcrowding, and long waiting times make public transport less convenient and less appealing for female users. Based on these findings, all the alternative hypotheses of the study are supported.

## Discussion

The findings of this study highlight the multifaceted challenges that restrict women`s use of public transportation in Lahore. The regression analysis confirmed that inadequate infrastructure, harassment and insufficient vehicle availability all significantly contribute to women`s low preference for public transport. These results align with broader literature on gendered mobility, where poor facilities, unreliable services and unsafe environments consistently emerge as barriers to female ridership. Inadequate infrastructure not only reduces comfort and reliability but also reinforces perceptions of inefficiency, discouraging women from depending on public transport. Collectively, these factors illustrate how structural deficiencies and social risks intersect to limit women`s mobility, pushing them toward private transport options that exacerbate traffic congestion and environmental degradation. Addressing these issues requires and inclusive strategy that prioritizes safety, accessibility and reliability, ensuring that public transport becomes a viable and empowering choice for women.

This research examines the key factors behind women's low preference for using public transportation in Lahore, revealing a complex set of problems that include poor infrastructure, harassment, and a lack of vehicles. These challenges meaningfully limit women's mobility and deter them from choosing public transportation, despite its well-known environmental benefits. The findings demonstrate that inadequate infrastructure leads to defective schedules, rough seating, poor cleanliness, and inconvenient bus stop locations, all of which contribute to the perception of inefficiency and unreliability. Harassment, which excessively affects women and other vulnerable groups, further dampens use of public transportation, while the limited number of vehicles limits access to the service altogether. This results in many women opting for private transportation, adding to traffic congestion and ecological pollution. The study highlights a solid link between low female ridership and these persistent issues, stressing that security, convenience, and accessibility are crucial for inspiring women to use public transportation. It demands an inclusive strategy focused on creating a reliable, secure, and user-friendly system that addresses women's unique needs, ultimately fostering greater female contribution in public transportation.

## Policy Recommendations

To address the challenges confronted by female commuters and encourage greater use of public transportation among women, this research offers several recommendations meant to enhance safety, comfort, and accessibility. Implementing clearly marked and separate seating for males and females can help address privacy and safety concerns, creating a more secure and welcoming environment for female customers. Equipping public transportation with high-quality air conditioning and maintaining strict sanitation standards through regular inspections, detailed cleaning, and adequate staffing will further improve the travel experience. Increasing the number of bus stops and placing them closer to work and residential zones, while ensuring they are well-lit, equipped with clean restrooms, comfortable waiting areas, and designated spaces for women, will make public transportation more accessible and suitable. Strengthening and imposing anti-harassment laws, installing security cameras, and introducing emergency response systems such as helplines and panic buttons are vital for ensuring passenger safety. Increasing the number of vehicles in operation, mainly during peak hours, along with implementing efficient scheduling systems, will decrease congestion and waiting times, thereby refining service reliability. Energetically involving women in planning and decision-making will ensure that their perspectives and needs directly shape strategies and services, resulting in more effective and inclusive solutions. By addressing these problems and applying the proposed measures, authorities can meaningfully improve accessibility, safety, and convenience, thereby enhancing women's confidence in the system and increasing their preference for public transportation. This shift away from private transportation would not only help ease traffic congestion but also reduce environmental pollution.

**Author Contribution**

**Zarafshan Ali:** data curation, formal analysis, writing – original draft. **Muhammad Bilawal Azam:** supervisor, writing – review & editing.

**Conflict of Interest**

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

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