Gendered Mobility Constraints in Semi-Formal Urban Transport Systems: An Empirical Study of Para-Transit in Lahore

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Abstract

The findings of this study disclose a very harassing environment where a significant majority reported frequent experiences of harassment in the forms of verbal intimidation and physical intimidation both at the time of waiting, while on travel, and upon arrival. These safety concerns further worsen with poorly maintained and male-dominated waiting areas, coupled with a deep-seated institutional lack of trust. The paper concludes that such barriers considerably reduce the mobility of women to access education, employment, and civic engagement and thereby undermine the urban autonomy of women. It argues that only an integrated intervention-a regulatory, infrastructural design and technological solution, along with deep-seated social attitudes-can bring about change in paratransit from a source of risk to a pillar for equitable mobility through participatory, gender-responsive planning.

***Keywords*:** gendered mobility, women's safety, para-transit, urban transport, theory of planned behavior, transport equity, gender-responsive planning

Introduction

Although urban populations are becoming increasingly congested, the rapid expansion of public transits i.e. metros, buses, etc., will not be able to accommodate the increasing number of people, thus leaving the void filled by the private transportation system (Saleemi, 2025). Auto-rickshaws zipping through congested street traffic with shared vans transporting multiple commuters and app-based motorcycles providing fast rides for passengers. For millions of people, especially those living in low-income and peri-urban areas, these transportation modes are no longer a choice but are their only means of mobility (Adu-Gyamfi, 2020). Via the informal network, it provides access to goods, services, jobs, etc. For many, lack of

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access to affordable and reliable transportation can limit their ability to find a job, get to work, or take care of their family's needs (UN Women, 2018). Nonetheless, public transport systems have deficiencies and many passengers have to endure crowded vehicles, poorly maintained vehicles and very little standards or regulations for operation (Shoaib, 2025). Both men and women experience these issues, but women's experiences during their daily commute are particularly challenging due to the added burdens of sexual harassment, cultural expectations of how and when they should travel, and antiquated movement control methods (Berik, 2023). Where men's daily travels are usually from point A to B only, women's point A to B is generally one continuous journey with multiple stops/drop-offs: e.g., dropping off children before heading to work, picking up groceries, etc., all of which is determined by their perceptions of safety and cost (Amber et al., 2023).

The impact of transit systems not taking these issues into account is that women experience far more than just inconvenience; as a result, transit systems keep women from being able to access educational opportunities, find and maintain employment, seek medical attention, and participate in everyday activities within the city. Research conducted throughout South and Southeast Asia has illustrated how this unwelcoming and unsafe transportation system has pushed women away from their worksites, away from their classrooms, and has hurt their overall mental health. Hence, making superior para-transit frameworks that are more secure, more conscious, and gender-responsive not as it was relates to progressing travel framework yields, but it is too a clear reaction to guaranteeing that ladies are given their respect, opportunity, and freedom to move around in the cities in which they live and work (Ng & Acker, 2018). As previously mentioned, there is clearly no time to wait regarding making transit systems gender-responsive.

This research gap reinforces the research requirement to execute comprehensive studies on women’s lived realities in para-transit. Through this research gap, urban designers and policymakers can develop appropriate frameworks to promote inclusivity and empower women through mobility, ensuring alignment with overall sustainable development goals.

Problem Statement

All of the sectors of public and scientists have started paying more attention to how women get round, however most of the research nevertheless zooms in on large, legitimate transportation systems. Meaning the semi-formal networks—rickshaws, Qingqis, experience-hailing apps are mostly omitted, even though thousands and thousands in cities throughout the worldwide South rely on them every day. In Pakistan, women continuously run into the same barriers: harassment, hardly ever any safe ways to tour, strict cultural rules that container them in (Iqbal, 2020). The scale isn't diffused. An extremely good variety of surveys makes it clear. In Bangladesh, 84% of women report going through sexual harassment on public transit (Mowri et al., 2024).

Regardless of how urgent this all sounds, we still recognize little or no women's protection and get the right of entry to within Lahore's para-transit scene. This loss of coverage holds back the proper varieties of regulations that are actually beneficial for real people. It's approximately girls' economic prospects, their independence, and their right to transport freely in their very own metropolis. This study hopes to offer a basic information basis from which actual, gender-responsive adjustments can be imagined and executed by generating strong, local records on the information of women's para-transit usage in Lahore.

Literature Review

Inclusive Mobility

Inclusive mobility frameworks push for transport systems that actually work for everyone—fair, accessible, safe. Women, older people, and people with disabilities need this the most (Tabassum, 2022). In South Asian cities, para-transit often tries to fill the gaps where regular public transit falls short. But let's be honest: the people planning these systems rarely think about gender. Things start to change when women help make the rules (Arshad, 2024). In much of South and Southeast Asia, getting around isn't just a hassle for women—it's risky, sometimes openly hostile. They deal with harassment, high costs, and systems built without their needs in mind. In Bangladesh, it's especially bad. ActionAid found that 84% of women have faced everything from staring and groping to unwanted touching or outright abuse during their commutes. Attacks and murders on public transport aren't isolated horrors. They send shockwaves through communities,

leaving families anxious every time a woman leaves home.

In Dhaka women make up about 85% of the city's garment industry workforce, but every day they face chaotic, unsafe commutes (Islam et al., 2014; Nasrin, 2015). Deep-rooted patriarchal attitudes only add to the misery, pushing women off mixed-gender buses and making overcrowded rides even more uncomfortable (Peter, 2013; Shefali, 2000). Many women say they'd rather use women-only transport. Social expectations around seclusion, and the constant fear of harassment, leave them feeling unable to speak up or defend themselves (Mannan & Ahmed, 2014). Shefali (2000) puts it bluntly: when transit ignores women's needs, it locks them out of society.

But there's hope. When countries build better infrastructure and actually follow through with real reforms, women gain both mobility and confidence. In Pakistan, though, the barriers start right at home. For many families, women need permission to travel. Privacy matters, and society keeps a close eye on whether women go out alone. Sometimes, a woman must have a male relative with her, or she faces strict limits on when and where she can go.

Safety Perception

Safety comprehensions are shaped by environmental conditions, artistic morals, former gests and institutional trust. Study shows that women's sense of instability is amplified in overcrowded, inadequately lit or manly-dominated apartments(Salemi, 2025). Studies punctuate that technological tool(e.g. AI- grounded mapping, CCTV) should address rather than replace direct feedback to directly capture threat comprehensions.

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Studies conducted in Stockholm, Sweden, using GeoAI combined with check data, revealed difference between algorithm- grounded prognostications and factual mortal comprehensions of safety. While GeoAI effectively linked environmental threat pointers similar as poor lighting, abandoned areas, and crime-prone zones, it failed to regard for private emotional responses and individual gests.

Para-Transit Systems

In many South and Southeast Asian cities, motorcycle taxis and three-wheelers have become essential first- and last-mile solutions, especially where pedestrian infrastructure is poor and walking to a trunk route is difficult. In South Asian cities such as Dhaka and Lahore, these factors contribute to women's dependence on paratransit and informal modes, as formal systems often fail to meet their spatial and temporal needs. For instance, about 93% of women workers in Dhaka use walking or informal paratransit for daily travel, while in Kampala, Uganda, low-income women identified paratransit as their only viable mobility option. These modes frequently act as connectors to BRT and MRT stations, with a notable share of mass-transit users relying on paratransit for station access.Essential yet complicated elements of urban mobility, para-transit systems are defined by their flexible routing, small-vehicle fleets, and semi-formal operational structures. There are important criteria for maximizing these services for effective systems are identified by academic consensus which are:

1. Better cooperation and integration with established mass-transit systems;

2. The planned use of digital technology to improve operational effectiveness, service quality, and the user experience;

3. Establishing well-defined legal systems and enforceable safety requirements to guarantee reliability and passenger safety;

4. To guarantee services meet community needs, significant user involvement in design and planning phases (Javid et al., 2020).

Even with this well-defined framework, a sizable gap between intention and action can still be found in the majority of urban areas in the developing world. In many cases, regulatory uncertainties and the difficulty of enforcing regulations create a situation in which the safety of the vehicle is in question, the behavior of the driver is bad, and systemic operational inefficiencies continue without being controlled, thus these phenomena jeopardize not only the safety but also the capacity of these means of transport that are vital to urban mobility.

Identified Research Gap

The need for gender-sensitive transport change is recognized worldwide. However, when we talk about the para-transit sector of

Pakistan's transport, this need faces a considerable lack of evidence. Most of the research have looked at the relationship between cultural norms, infrastructure, and the occurrence of harassment in semi-formal transport (Berrick, 2023) with the help of the existing infrastructure. Nevertheless, there is a dearth of targeted, data-driven studies that deeply explore the issues of safety and the effects of these issues on the women empowerment in this important sector of their mobility, thus, the gap between the universal principles and the local knowledge that can be acted upon still exists.

Methodology

The present research uses a quantitative, cross-sectional design to systematically document and then analyze the transport realities of residents in Lahore, Pakistan. As the main instrument, it provides detailed information on mobility patterns, perceptions of safety, and experiences of harassment faced by inhabitants within the para-transit ecosystem of the city.The present research uses a quantitative, cross-sectional design to systematically document and then analyze the transport realities of residents in Lahore, Pakistan. As the main instrument, it provides detailed information on mobility patterns, perceptions of safety, and experiences of harassment faced by inhabitants within the para-transit ecosystem of the city. In this regard, a dual approach to sampling was utilized for robust data collection and representation. Stratified random sampling was firstly implemented dual approach to sampling was utilized for robust data collection and representation.

The check collected quantitative and qualitative data, measuring safety comprehensions via Likert scales. As a means of icing that a wide range of sociodemographic biographies were included, across a number of different megacity zones, so that the sample well- represented the mixed civic population there (Taubenböck et al., 2019). The sample comprised diurnal conveyance druggies, para transit motorists, and women in low-income peri-urban communities to prioritize existential sustainability (Allen & Farber, 2020). The check collected quantitative and qualitative data, measuring safety comprehensions via Likert scales (Mouratidis et al., 2021). Ethical protocols were followed, including informed consent, clear data-handling explanations, and anonymized secure storage to ensure candid responses (Clark, 2020). A gender- disaggregated approach was central, expounding the unsexed confines of communal mobility. Using a quantitative, cross-sectional approach, it digs into the details — how

residents move through the megacity, how safe they feel, and what feathers of importunity they run into while using para-transit (those in-between options like cabs, vans, and ride-hailing apps).

To get a solid picture, we graded the figures using Cochran's formula, aiming for a 95 confidence position and a 5 periphery of error. That meant we demanded about 384 people. Awaiting that not everyone would respond, we set out to survey 460, and ended up with 414 completed responses.

We mixed stratified and intentional slice to make sure we covered the megacity's diversity. For stratified arbitrary slice, we broke Lahore into six zones — Inner City, Cantonment, DHA, Gilbert, Model Town, and Walton, so the geographic spread matched the real megacity. We also resolve the sample across different types para transit(40 bus-gharry, 35 Qingqi/ vans, 25 lift-hailing apps) and made sure to survey people at different times of day — mornings, afterlife, evenings.

That's what the final group looked like 250 women who use para-transit(that is about two-thirds of the sample), 100 men, and 34 motorists. Among the women, we looked at different periods, inputs, and types of work to get a fuller picture.

Intentional slice added another sub caste. We specifically reached out to frequent para-transit druggies, especially working women, scholars, women with disabilities, and transport workers involved in megacity mobility planning. We gathered both quantitative and qualitative data, asking about safety using Likert scales. Everyone who took part gave informed concurrence, knew how we had handled their data, and got the assurance of sequestration. We kept responses anonymous and locked down.

For analysis, we used descriptive stats and erected compound indicators to measure effects like safety and how important people felt their mobility was confined. Gender differences were frontal and center — we wanted to see how civic mobility plays out for men and women.

As for the process, we started with an airman check of 30 people over two weeks to iron out any kinks. After that, the main check ran for eight weeks and reached 384 people, with a solid 90 completion rate. Screening questions made sure we only included folks who actually use transit at least three times a week. On the stats side, the sample size gave us enough power (0.80) to run tests like I- forecourt, t- tests, ANOVA, and retrogression. That way, we could compare different groups and still keep the compass

manageable for a single megacity study with limited coffers.

Results and Discussion

Respondent Demographics

Half of the women respondents (50%) were aged between 21 and 30 years (Table 1). Nearly half (48.8%) of the women respondents stated that they were students, and this shows that a significant portion of women's travel needs in students, are related to educational commutes. The survey sample was economically based on the city's lower- to middle-income strata as most of the respondents reported a monthly household income between 30,000 and 90,000 Pakistani Rupees—a range that is in line with the primary user base of affordable transport options (UN Women, 2018). The information collected through the surveys played an important role in showing that para-transit is the main means of everyday mobility. A large number of both women (76.3%) and men (83.1%) have indicated that they regularly use these services (Table 1); thus, paratransit can be considered as a lifeline for the urban population.

Table 1

Demographic Profile of Women Respondents

Variable	Category	Percentage
Marital Status	Single	63%
	Married	28.3%
	Divorced	6.3%
Age	<20	16.7%
	21–30	50.3%
	31–40	17.3%
	41–50	7.2%
	51+	8.4%
Employment	Student	48.8%
	Housewife	17.1%
	Private Job	13.7%
	Business/Self-employed	10.7%
	Government Job	9.7%
Monthly Income	<30,000 PKR	12.4%
	30,000–60,000 PKR	26.1%
	60,000–90,000 PKR	27.1%

Variable	Category	Percentage
	120,000–150,000 PKR	19.4%
	>150,000 PKR	15.1%

The majority of respondents (63%) identified as single, while 28.3% were married and a smaller proportion (6.3%) were divorced.A significant portion of the sample (50.3%) falls within the 21-30 age group, indicating that young adult women constitute the majority of respondents. The major dominance of younger age groups implies that the survey indicates the experiences of women in their most socially and economically active years.

Use Patterns and Mobility Needs

This data indicates how women transit has been affected by the gender-specific nature of their arrears. Nearly half (48 %) of surveyed women (Table 2) reported diurnal reliance on para conveyance services, making it a integral to communal life and a pivotal determinant of civic access.

Table 2

Women's Para-Transit Usage Patterns

Variable	Category	Percentage
Use of Para-Transit	Yes	76.3%
	No	23.7%
Purpose	Shopping	25.1%
	Academic Travel	23%
	Work	18.7%
	Visiting Family	18.3%
	Social Gatherings	13.6%
Frequency	Daily	44.1%
	Often (1–4×/week)	14.4%
	Sometimes	21.9%
	Rarely	13.1%
	Very Rarely	9.4%
Preferred Travel Time	Morning	50.5%
	Afternoon	20.7%
	Evening	18.4%
	Night	10.4%

A majority of respondents (76.3%) confirmed that they use para-transit

modes such as rickshaws, Qingqis, or wagons, while 23.7% reported that they do not.

Safety Concerns at Waiting Areas

Table 3

Factors Contributing to Feelings of Insecurity

Factor	Percentage
Overcrowding	20%
Male-Dominated Spaces	15.9%
Poor Maintenance	14%
Lack of Facilities	13%
Insufficient Police Presence	10.7%
Poor Lighting	9.7%
Deserted Areas	7.4%

Overcrowding (20%), male-dominated spaces (15.9%), poor maintenance (14%), lack of facilities (13%), insufficient police presence (10.7%), poor lighting (9.7%), and deserted areas (7.4%) were key factors contributing to insecurity.

Harassment During Travel

Table 4

Experiences and Observation of Harassment

Variable	Category	Percentage
Harassment While Traveling	Always	21.8%
	Sometimes	44.6%
	Never	33.6%
Witnessed Harassment	Yes	45.5%
	No	44.5%
	Never	10%

Table 5

Perceived Harassers

Category	Percentage
Other Passengers	33.9%
Drivers/Riders	31.9%
Other Road Users	34.2%

Perceived Responsible Parties

Table 6
Suggested Gender-Sensitive Interventions

Intervention	Percentage
Install Cameras	26.6%
Awareness Campaigns	25.5%
Driver Training	24.6%
Implement SOPs	23.2%
Other	0.2%

Perceived Behavioral Control and Constraints

Table 7
Awareness of Safety Agencies

Response	Percentage
Aware	30.3%
Not Aware	69.7%

Three key concerns arise: the absence of comfortable vehicles, the need of straightforwardness in passages and streets, and concerns around female security. Among these, security is distinguished as the most critical issue.

Social Norms and Influence Factors

Table 8
Threat with Weighted Scores

Threat	Weighted Score
Ogling/Leering	0.59250
Touching	High
Blocking the Way	High
Kidnapping	Moderate
Teasing	Moderate
Sexual Remarks	Moderate

Gender-Based Comparative Analysis

Table 9
Frequency of Harassment Types

Harassment Type	Frequency Trend
Staring	Very Frequent

Harassment Type	Frequency Trend
Whistling	Frequent
Touching	Frequent
Sexual Comments	Frequent
Stalking	Moderate
Non-consensual Photos	Moderate
Obscene Gestures	Moderate
Physical Attack	Less Common

Perceived Behavioral Barriers

Table 10

Barriers Reducing Women's Transit Autonomy

Barrier	Severity
Safety Concerns	Highest
Vehicle Quality	High
Fare Transparency	Moderate–High

Intention to Use Para-Transit

Table 11

Factors Influencing Continued Use

Factor	Importance
Affordability	High
Complaint System	High
Safety & Security	Very High

The three most significant motivators identified are affordability, the presence of an effective complaint and follow-up system, and assurance of safety and security.

Men's Perspective on Women's Safety

Table 12

Men's Observations and Awareness

Variable	Category	Percentage
Witnessed Harassment	Yes	51.8%
	No	25.1%
	Unsure	23.1%
Perceived Harasser	Drivers	29.7%

Variable	Category	Percentage
	Passengers	28%
	Road Users	24%
Aware of Agencies	Yes	29.2%
	No	70.8%

Table 13

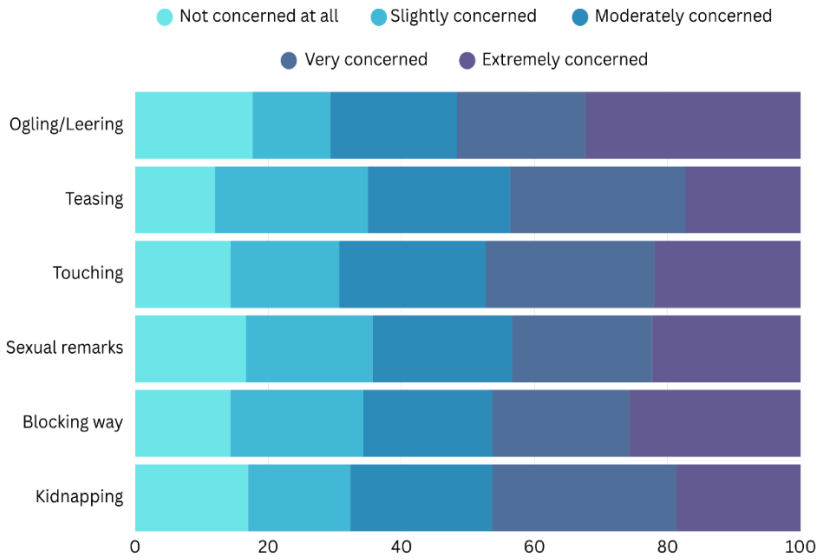
Men's Support for Safety Interventions

Intervention	Support Level
Driver Training	Very High
Separate Seating	Very High
CCTV Cameras	Very High
Police Patrols	Very High
Awareness Campaigns	High

Gender Comparison of Perceived Risk

Figure 1

Gender-Based Risk Comparison



Women consistently report higher perceived risk than men, especially for ogling/leering, teasing, and touching. This perceptual divide underscores the gendered nature of transit insecurity.

Conclusion

"The data reveals an alarming fact. Women of Lahore are dependent on paratransit transport. They are completely dependent on the transport. More than three quarters of the women respondents do not have any other alternative transport. Rickshaws and van-sharing are the only transport available to them to attend their classes, offices, or markets. But this most essential service is the only one that fails to guarantee their security."

Dread begins even before the woman reaches the stage of travel. As has been found in our own research, waiting alone for a lift is in itself a cause of extreme distress. The waiting stations in rural areas are dark, and very crowded, and a woman feels that there are somehow watching her. Then there is travel, and instead of this fear vanishing, it assumes a different form. Then there is harassment, and this is not an isolated incident, this is what each woman gets to face every day.

Transit harassment changes the ways in which women travel around in the city. Their priorities change to include security over price and accessibility. Leering and sexual language are common issues. There is also a marked difference in perception between genders, with women feeling less safe than men.

People already understand that solutions such as trained drivers and security cameras are available. Rather, the issue is not that there is a lack of solutions, but rather the fact that there is no one to hold the line for the protection of the passengers. Because of this, the public transport system of Lahore is necessary but vulnerable to its current state.

The results support other regional findings that have emerged in the South Asian culture. A related instance has emerged in the neighboring country of Bangladesh, where 84% of women have self-reported being victims of sexual harassment on public transport, further substantiated by global literature that has revealed that the effect of poor lighting and the use of isolation areas has a profound impact on perceptions of transport safety, especially for women.

The effects go beyond being inconvenient. Inadequate transport infrastructure is a barrier to women’s education, employment, healthcare, and political engagement in general. It hinders the autonomy of cities.

Hence, transformative change needs to shift gears from isolated actions

to comprehensive transformation involving regulation, technology, infrastructure, and social aspects.

Policy Recommendations

Regulatory and Institutional Measures

- Mandatory licensing, history checks, and gender-sensitivity schooling for drivers.
- Enforcement of standardized fares and obvious fare displays.
- Establishment of specialized transit safety devices for ladies.

Technological Interventions

- CCTV installation in vehicles and primary stations.
- Mobile emergency apps linked to police and delivery authorities.
- Digital complaint systems with guaranteed follow-up.

Infrastructure and Urban Design

- Well-lit, handy, and gender-touchy waiting areas.
- Improved signage, pedestrian zones, and visibility in transit hubs.
- Inclusion of generic design for disabled and aged girls.

Community and Behavioral Change

- Awareness campaigns targeting guys and children.
- School and college packages promoting safe mobility practices.
- Public messaging in opposition to harassment in shipping areas.

Participatory Planning

- Citizen advisory panels consisting of women, drivers, and neighborhood leaders.
- Regular safety audits incorporating women's lived reviews.

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.

Data Availability Statement

Data associated with this study will be provided by the corresponding author upon reasonable request.

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