



RESEARCH PAPER

**The Role of Pink Bus Services in Promoting Women's Mobility:
Empirical Evidence from Lahore, Pakistan**

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ABSTRACT

Fear and security are the predominant factors that often restrict physical mobility among women. In Pakistani male-dominant culture, women possess different mobility barriers related to privacy, safety, and security. The women-only bus service, known as Pink Bus, is one of the gendered transport initiatives to facilitate secure travel. The study aims to analyse women's perceptions of this service and its role in promoting mobility. The data was collected from a sample of 180 women riding in pink and regular public buses. SPSS was used to analyse the data. Statistics revealed that the pink bus service has failed to meet the users' needs due to its limited availability. Findings further suggest that although this initiative has significantly enhanced security perceptions during the bus ride, there is a need to ensure women's safety while accessing this bus service. The study highlights the importance of safety perceptions in promoting independent mobility among women in Pakistan.

KEYWORDS Women-Only Bus/Pink Bus, Safety And Security, Mobility

Introduction

During recent years, the human population has increased dramatically worldwide, which is a pretty evident phenomenon in urban areas (Liu et al., 2018). The developing world is experiencing an unprecedented process of urbanisation. The level of urbanisation in Asia has been steadily increasing, and it is expected to reach 53.4 per cent by 2030 (Jones, 2017). Even though cities offer diverse opportunities to realise people's dreams, such a population influx in urban areas faces multiple challenges and demands. It is often depicted by the lack of capacities to provide enough jobs to the citizens, which ultimately enhance poverty, unemployment and several other associated urban issues (Zhang, 2016).

Many people experience different obstacles to reaching opportunities and services, including physical, social and economic barriers. Until these barriers are not removed, a significant portion of the population will remain unable to move as their opportunities to participate in the life of the communities will stay poor (Ignaccolo, Inturri, Giuffrida, & Torrisi, 2016). It leads to social exclusion, inequity and constitutes a field of contestation among different social groups (Al-Rashid, Harumain, Goh, & Ahmad, 2021; Hernandez, 2018). However, social inclusion can be achieved by promoting physical mobility, and this is only possible by ensuring access to opportunities such as social networks and services (Kenyon, Lyons, & Rafferty, 2002). Hence, it is essential to understand the nature and extent of mobility barriers that

contribute to social exclusion among individuals living in the setting (Al-Rashid, Nahiduzzaman, Ahmed, Campisi, & Akgün, 2020; Church, Frost, & Sullivan, 2000).

Literature Review

Fear and security are some of the prime contributors towards mobility and transport mode choice. These factors primarily discourage women from using and accessing public transport services (Church et al., 2000). Furthermore, physical mobility is a potentially risky activity for women due to unwanted interactions with men in public and loss of honour (Papanek, 1971). Moreover, privacy and security issues in the male-dominant society and gendered division of public and private spaces are palpable. As a result, women generally prefer to stay at home and are increasingly concentrated in homemaking roles resulting in negligible participation in civic activities like cultural, religious and political activities. These factors symbolise women's exclusion from the public realm, physical mobility and smooth travel (Adeel, Yeh, & Zhang, 2016; Ahmed, Imran, & Scheyvens, 2018). Hence, it can be argued that privacy, security, and fear of travel are the most dominant factors among women immobility in Pakistan.

With a total population of 204 million, Pakistan women possess a significant share concerning numbers (Statistics, 2017). However, along with other services, the Government of Punjab has failed to account for the problems associated with women commuters. The situation is not much different in Lahore, the most crowded urban area of the Punjab Province. Even though efficient transport remains a significant issue for both genders, its dimensions are critical for women (Adeel, Yeh, & Zhang, 2017; Ahmed, 2018). Regardless of the societal barriers, women need to undertake several mandatory and discretionary activities and venture outside their homes. However, results suggest that women do not prefer travelling in congested public transport to avoid the risk of insecurity in male-dominant vehicles (Adeel et al., 2016). In addition to the social pressure, in the form of family restrictions, gendered problems further exaggerate the mobility constraints for women (Adeel & Yeh, 2018; Al-Rashid et al., 2021).

Such a situation of immobility among women can also be attributed to the unavailability of safe, secure and economical means of transportation that can address the social dimensions associated with women needs. To realise the norms and gender segregations in the local context, the front seats are specially designated for women in the public buses and vans. However, verbal and physical harassment at the bus stops and in the vehicles are the daily incidences (Anwar, Viqar, & Mustafa, 2018). Regardless of the increase in enrollment in educational and technical training centres and active participation in the labour force during the last decade, safe transportation methods to encourage their mobility has neither expanded nor moved forward. At the same time, government transport divisions have made a few endeavours to address this issue by adding more vehicles to their current fleet and welcoming private transporters. However, these endeavours had practically no effect intending to these issue of women transport needs.

Keeping in view specific objectives like the security of women and prevention from gender exploitation, capacity issue, and increasing mobility of women, the Government of Punjab started a women-only bus service initially on three routes in Lahore, the largest city of Punjab province. The bus service is a joint venture of the provincial social welfare and women development department, transport department and the city district government. This study assesses the performance of women-only bus service and analyses its contribution to promoting mobility among the women population in Lahore. It will be helpful in genuinely evaluating the safe and secure mobility among women while using this mode.

Material and Methods

Study Area

The women-only Bus, or Pink Bus, operates in the Lahore metropolitan, the provincial capital of Punjab and is home to more than 11 million people (Statistics, 2017). Lahore Transport Company is regulating this service. Three pink buses with women conductors, but male drivers, run on three routes: (a) B-01, (b) B-22, and (c) B-33, as shown in Table-01. These women-only buses have a pink-coloured body all around. The initiative aimed to provide modern and affordable transport and prevent gender harassment by offering safe and secure travel opportunities. In addition to the women-only bus routes, the regular public bus routes also operate along the same routes mentioned in Table 1.

Table 1
Description of Pink Bus Routes in Lahore

Sr. No.	Route No.	Route Alignment	No. of Buses	Round Trip Length (km)
1	B-01	RA Bazaar to Civil Secretariat	01	26.4
2	B-22	Jallo Mor To Pakka Meel via Canal Bank Road	01	78.6
3	B-33	Railway Station to Green Town	01	63.8

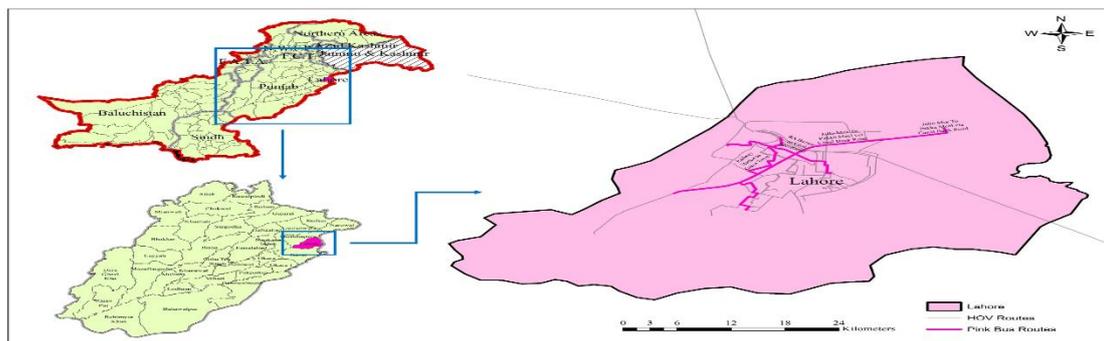


Figure 1: Spatial Distribution of Pink Bus Routes in Lahore

Route B-01 bus starts its journey from origin point Sanda and completes its trip at destination point at R.A. bazaar by travelling a total distance of 13.2 km. The route has been designed keeping in view high-density areas and important stops such as Muhammedan Anglo-Oriental (MAO) College, Secretariat, Museum, Punjab University campus, High court, Fortress, canteen store department (CSD), Pakistan Air Force (PAF) Market, and R.A. Bazaar. B-22 bus route completes the trip from Jallo Morr to Thokar Niaz Baig, and the total distance for the trip is 39.3 km. The route covers the city's central corridor, connecting different educational institutes and commercial hubs with the residential districts. Significant land uses along this route includes: Punjab University, Punjab College, Doctors Hospital, Daewoo Terminal, and Metro Cash and Carry retail market. Similarly, the third Pink Bus Route B-33 is planned to provide accessibility to women commuters of the nearby towns using the main bus terminal and Lahore railway station. The spatial distribution of these routes is shown in Figure 1.



Figure 2: Glimpse of the Pink Bus in Lahore

This study is primarily based on the primary data to analyse the accessibility of women in terms of safety perception towards pink buses. The critical survey instrument used is the interviewer-administrator having a structured questionnaire. The data was collected during weekend and working days from the women riders travelling within women-only and regular buses running on the same routes. The respondents who were willing to participate are part of our sampling units. Using the random sampling technique, the following number of questionnaires were filled from women:

- 60 questionnaires from B-01 women-only/pink bus riders
- 60 questionnaires from B-22 women-only/pink bus riders
- 30 questionnaires from passengers of B-01 regular public bus
- 30 questionnaires from passengers of B-22 regular public bus

Users were surveyed to get information about their satisfaction levels while using the pink bus service, problems they face, demand the extension of this service and incorporate suggestions recommended to improve the existing service. Furthermore, they were asked the questions such as age, trip purpose, the frequency of using pink bus service, the average time to wait on stops for the pink bus, satisfaction level regarding various safety parameters, and preference of using pink bus over other modes of transportation. In addition, a comparison has been made to analyse the performance of the pink buses with regular buses along the same routes. Moreover, the study utilised multiple regression analysis to analyse women's riding experience in these pink buses. Finally, the women safety and privacy issues that restrict access to this specific transport mode have been discussed.

Results and Discussion

Riders Age

We have tried to compare and familiarise ourselves with the dominance of various age groups using these services from the survey. As depicted in Table 2, most women users of regular bus routes are in the age category of 25-34 years followed by the above 45 years age category that is 30% each and least users are of the age group 16-24 years (24%). There are no passengers with ages up to 15 years. In Pink Bus Route (termed as PBR in further discussion) B-22, the highest percentage of women users is in the age category of 16-24 years. It includes students and working women travelling towards their

destinations in the morning. Only 3% of women above 45 years travelled through this pink bus.

Table 2
Age of the Respondents

Age Category	Regular Bus Routes	PBR B-22	PBR B-01
Up to 15	0%	6.7%	3.3%
16-24	23.3%	70%	43.3%
25-34	30%	10%	23.3%
35-44	16.7%	10%	10%
45 & above	30%	3.3%	20%
Total	100%	100%	100%

In PBR B1, the most dominant age group of users is also 16-24 years and includes students using this service frequently. After this, 23% of users are aged 25-34. It shows that this women-only service is more frequently used by working women going to their workplaces and students going to their educational institutions. In contrast, women students are comparatively less in number in the regular routes. In other words, women students who have to travel on regular routes usually prefer dominant para-transit modes such as Qingqi, rickshaws and online taxi services.

Trip Purpose & Frequency

This variable has been included in the questionnaire to get information about various types of trips for which women use regular and pink buses. Most of the trips are educational and job-based. As primary land use along route B-22 is Punjab University, the ratio of student users is high on this route. Similarly, the dominant users in PBR B-01 are the students compared to regular bus routes. The least number of trips is generated for shopping on all these routes. However, a reasonable percentage of women use these services for various purposes. These trips may include infrequent visits to relatives and friends. So, in comparison to the regular routes, where a significant proportion of travelling women is employees, the major percentage of trips generated are educational.

Table 3
Purpose of Trip

Trip Purpose	Regular Bus Routes	PBR B-22	PBR B-01
Educational	23.3%	50%	46.7%
Job	36.7%	26.7%	20%
Shopping	3.3%	6.7%	3.3%
Any other	36.7%	23.3%	30%
Total	100%	100%	100%

As far as privacy and safe travel among women in Pakistan are concerned, our analysis amazingly revealed that very few women use these pink buses regularly. For the case of PBR B-01, about 16.4 per cent use this service daily, while 47 per cent of them use it occasionally. A similar trend is being followed by the users of PBR B-22 riders, as only 18.6 per cent are daily commuters, and a significant percentage (43.6) prefer it occasionally. In other words, even the daily commuting women use pink bus service occasionally because there is only one pink bus per route and possess a very long headway.

Table 4
Frequency of Traveling with Women-Only Buses

Frequency	PBR B-22	PBR B-01
Daily	18.63%	16.4%
2-3 days a week	21.79%	24.9%
4-5 days a Month	15.98%	11.5%
Occasionally	43.6%	47.2%
Total	100%	100%

Regarding the women using pink bus daily, one aspect was noticed that these women either start their journey from the point from where the pink bus starts its trip, so they need not wait for the bus at the stop. This is because most of them are now aware of the schedule of the pink bus, so they prefer to use this service over other regular buses. This is particularly common for the passengers at the Jallo terminal of route B-22. On the contrary, the residents of other districts along the PBR routes usually do not avail of this service regularly. The main reason behind this is the perceived unsafety associated with the prolonged waiting time at the bus stop.

Change in Travel Time

Regarding the women using the pink bus occasionally or in any other circumstances, it is apparent that these women, even daily commuters, either do not wait for the pink bus at the stop or wait for it for just a brief period. As soon as they find a regular bus at the stop, they board it immediately. One of the most irritating moments for anyone is to wait for a bus at the bus stop. Women wish for a more significant number of buses to be operated on the routes to have a short headway time. However, on the other side, due to just one pink bus being operated on one route, the average headway time for the pink bus is beyond 1 hour.

Table 5
Average Time to Wait on Bus Stop

Waiting Time	Regular Bus Routes	PBR B-22	PBR B-01
< 5 minutes	3%	23%	10%
5-10 minutes	27%	27%	20%
10-15 minutes	47%	14%	10%
15-20 minutes	13%	3%	7%
25-30 minutes	0%	0%	7%
> 30 minutes	10%	33%	7%
Don't Wait	0%	0%	40%
Total	100%	100%	100%

Table 5 shows that waiting time for the regular bus is minimum as compared to Pink Bus Routes, as 33% of women users of PBR B-22 recorded that they have to wait more than 30 minutes and maximum respondents of PBR B-1 do not wait for the pink bus because of long headway time. Therefore, it is observed that the initiation of women-only bus routes has not significantly reduced travel time. To avoid the delay in getting to their destination, women use other modes of transportation. The analysis further revealed that the proportion of women using other modes is maximum if they are users of pink buses. Concerning the reasons to use other modes, women highlighted that the pink buses are very small in number. If they are interested in a total male-women segregated travel to ensure safe travel, they prefer to use a para-transit instead of waiting for hours on the bus stop for the pink bus.

Change in Safety & Security Perception

Safety and security perceptions play a vital role in changing the modal shift (Masoumi & Fastenmeier, 2016), and this perception is deeply enriched in the women population. Different variables are selected to analyse the changes observed in safety perception among women by using these women-only bus services. This perception is observed; while (1) travelling in the bus, (2) waiting for the bus at a stop, and (3) accessing the bus. The results suggest that the women respondents are satisfied with the safety and privacy situation while travelling inside the pink bus. Regardless of women's age group and profession, the safety perception showed positive change inside the bus. However, no change is observed when women access and wait for the pink bus at the designated stops. In this regard, almost 95% of the respondents are incredibly dissatisfied with the safety situation.

To further elaborate on this situation, we have considered the hypothesis that women security perception and satisfaction do not change regardless of their mobility/travelling pattern. This safety satisfaction is considered the dependent variable, denoted as 'b'. In addition, the independent variables (denoted with the symbol 'a'), also called predictors, have been taken into consideration for analysis. These are termed 1) travelling alone, 2) travelling with friends, and 3) travelling with family. Multiple regression analysis is applied to find out the association between the travel patterns and; (a) safety satisfaction at a bus stop and (b) safety satisfaction while accessing the pink bus. For both cases, one of the independent variables (i.e., travelling alone) is held constant and compared with the remaining two other independent variables. In this regard, the model summary and ANOVA details are depicted in the following discussion.

Safety and Security Perception at Pink Bus Stops

Regression analysis suggests that the dependent variable is strongly correlated with selected independent variables directly linked to safety while waiting for the bus at the stop. For example, the value of $R=0.944$ shows a high positive correlation, as shown in the model summary.

Table 6
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.944 ^a	.892	.890	5.27868

a. Predictors: (Constant), Travelling with Family, Travelling with Friends

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22278.510	2	11139.255	399.766	.000 ^a
	Residual	2702.850	97	27.864		
	Total	24981.360	99			

a. Predictors: (Constant), Travelling with Family, Travelling with Friends

b. Dependent Variable: Safety Satisfaction at Bus Stop

The value of R Square helps to identify the proportion of changeability in the dependent variable, and this estimated multiple regression can interpret it. Here, the value of R Square is 0.892, which depicts that the predictors explain about 89.2% of the

variance in the dependent variable. Moreover, the unstandardised coefficient for women while travelling with friends is 27.150, and when their family members accompany them, this coefficient rises to 34.950. It means that the safety and security perception for the women while travelling with friends is significantly higher and is statistically significant compared to travelling alone. However, the most significant results are when women wait for the bus with their families.

Safety and Security Perception while Accessing Pink Bus

Similarly, the regression analysis for this case also suggests the strong association between the dependent variable and the number of independent variables directly linked to safe travel. The value of $R=0.907$ shows a high positive correlation, as shown in the model summary.

It can be inferred from the results that the overall model is significant since the p -value is less than 0.05. The R-square value, in this case, is 0.822, which demonstrates that 82.2% of the variance is accounted for the safety satisfaction in accessing buses by the independent variables. The coefficients specifically elaborate on the variables that significantly depict the dependent variable and how the predictor variables impact the dependent variable. We can see that as the predictor increases by one unit, the dependent variable increases by the unstandardised coefficient of that variable. For example, the unstandardised coefficient for the women travelling with friends is 21.487, while women accompanied by their family members is 33.30. It means that the safety and security satisfaction for the women while travelling with friends is significantly higher and is statistically significant compared to travelling alone.

Table 7
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.907 ^a	.822	.819	6.22723

a. Predictors: (Constant), Travelling with Family, Travelling with Friends

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17428.493	2	8714.247	224.719	.000 ^a
	Residual	3761.507	97	38.778		
	Total	21190.000	99			

a. Predictors: (Constant), Travelling with Family, Travelling with Friends

b. Dependent Variable: Safety Satisfaction while Accessing Pink Bus

Realising the positive correlation and p -value of less than 0.05, we can reject the hypothesis for both the scenarios mentioned above and comprehend that the mobility patterns can change the security and safety perception. Therefore, it is concluded that travelling alone is a risky factor perceived by the women respondents and is not preferred. When they are accompanied by their women family members and friends, their satisfaction and perception towards security and safety changes. Moreover, it is also observed that women feel safer with their families than their friends.

Conclusion

An increase in the number of women in Pakistan's labour force and enhanced enrollment in educational and technical training centres over the last few years requires

the provision of safe means of transportation to facilitate their mobility. Women-only bus service in Lahore is gender-specific public transport, and the survey suggests that it primarily benefits the students and working women on B-01 and B-22 routes. However, most women can use this service occasionally simply because one pink bus is plying on a route and headway time is long. Hence, forcing them to go for other services instead of waiting for hours on the bus stop for the pink bus due to privacy and safety factors embedded in the local culture. Nevertheless, most women prefer this service over regular buses because they feel more comfortable travelling in an environment free of gender harassment. Overall, 100% of women appreciated the Government's initiative to relieve the women from daily hustle and insecurity, especially within the bus. However, the satisfaction level regarding safety is relatively low while accessing and waiting at a bus stop which hampers their preference to use this mode. Moreover, regression analysis suggests that travelling alone increases the unsafe conditions, and perceptions towards security decrease. To conclude, it can be argued that even though the Government has invested and attempted to reduce barriers towards women mobility, some infrastructural improvements are required to attract more women in this gendered transport mode. Moreover, keeping in view the cultural stigma, there is a need to consider the fear-based aspect within the public transport sector in Lahore and Pakistan to gather the real socio-economic benefits from this population group.

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