

Safety on Board: How Fare-Free Public Transport Shapes Women's Mobility and Empowerment in Urban India

Abstract

Safety-related challenges in urban transport hinder the mobility of both men and women, with women experiencing significantly greater constraints—especially in the Global South. In India, the threat of violence in public transit frequently deters women from participating in socio-economic activities, limiting their empowerment. In response, Delhi introduced the *Pink Pass Policy* in 2019, offering women fare-free bus travel and enhanced safety measures.

This research investigates the impact of the Pink Pass policy on women's perceptions of urban transport safety and mobility behaviors. Using logistic regression analysis on my own primary data collected from the Delhi Women Survey (2023) [N=2,142], I assess changes in perceived safety and urban mobility during the policy's implementation period.

Results show that the pink pass policy significantly improved women's perceptions of safety and socio-economic transport mobility.

My findings reveal a positive impact of the pink pass policy on women's perception of urban transport safety and mobility. The results underscore the importance of safer urban transport for women's empowerment. To the best of my knowledge, this is the first empirical study to examine the link between fare-free urban transport and women's safety perception in India. The research offers critical insights into designing gender-sensitive urban transport policies across the Global South.

Keywords: Transport Safety; Women Mobility, Fare Free Urban Transport; Violence against women; Pink pass policy

Research Questions (RQ):

RQ1: Has the Pink Pass policy influenced women's perception of urban transport safety after the policy implementation?

RQ2: Has the Pink Pass policy increased women's socioeconomic mobility after the policy implementation?

Hypothesis:

1. Women who use the Pink Pass perceive urban public transport as safer than non-users.
2. Women's safety perception of urban transport is associated with socioeconomic mobility.

Data & Use of Variables

This study utilizes primary data collected through the **Delhi Women Survey (DWS, 2023)**, a door-to-door survey conducted across Delhi with a sample of **2,142 women respondents**. The survey was specifically designed to capture women's experiences related to urban mobility, safety perceptions, commuting patterns, and socio-cultural factors both before and after the policy implementation in 2019.

The data compares two groups in the intervention period;

1. Women who use pink passes (treatment group).
2. Women who do not use pink (control group).

The research analyzes 4 categorical variables from survey questions (Table 1):

Table 1. Summary of use of research variables

Variable name	Survey question	Response options	Variable type
Perceived transport safety	Do you feel that safety in Delhi buses has improved after the pink pass policy?	Yes/ No/ Unsure	Dependent/ Independent
Transport mobility	Have you increased your urban transport mobility after the pink pass policy?	Yes/ No/ Unsure	Dependent
Pink pass usage	Do you use pink passes for fare-free bus rides?	Yes/ No	Independent
Prior experience of violence	Have you experienced violence in public buses?	Yes/ No/ Unsure	Independent

Methodology and interaction of variables

Logistic regression is employed in this study due to the binary nature of the dependent and independent variables.

RQ1. model: Transport Safety Perception

$$Pr(Safety_i = 1) = 1 / [1 + \exp^-(\beta_0 + \beta_1 PinkPass_i + \beta_2 Violence_i + \beta_3 (PinkPass_i \times Violence_i) + \varepsilon_i)]$$

where:

$Safety_i$ = 1 if respondent perceives improvement in bus safety; 0 otherwise

$PinkPass_i$ = 1 if respondent uses the Pink Pass; 0 otherwise

$Violence_i$ = 1 if respondent has experienced violence in public buses; 0 otherwise

$(PinkPass_i \times Violence_i)$ = interaction term between policy usage and prior violence

ε_i = error term

RQ2. model: Increased Transport Mobility

$$Pr(Mobility_i = 1) = 1 / [1 + \exp^-(\gamma_0 + \gamma_1 Safety_i + \gamma_2 PinkPass_i + \gamma_3 (Safety_i \times PinkPass_i) + \mu_i)]$$

where:

$Mobility_i$ = 1 if respondent reports increased mobility during the policy period; 0 otherwise

$Safety_i$ = 1 if respondent perceives buses as safer; 0 otherwise

$PinkPass_i$ = 1 if respondent uses the Pink Pass; 0 otherwise

$(Safety_i \times PinkPass_i)$ = interaction term between perceived safety and pass usage

μ_i = error term

Findings and results:

My findings reveal a significant variation in safety perceptions and mobility outcomes based on Pink Pass usage and prior experiences with violence in urban transport.

Findings of RQ1.

1. Among Pink Pass users with **no** prior experience of violence, **over 60%** reported improved perceived safety after the policy implementation.
2. Pink Pass users who **experienced** violence still reported a **40%** increase in perceived safety.
3. In contrast, women who **did not use** the Pink Pass—regardless of their experience with violence—reported only a **30%** improvement in perceived safety during the policy period.

Findings of RQ2.

1. Pink Pass users with **safety** perception in buses experienced a **60%** increase in urban mobility after the policy implementation.
2. Pink Pass users with even **unsafe** perceptions experienced a **40%** increase in mobility.
3. In comparison, women who **did not use** the Pink Pass, regardless of their safety perception, showed a **20% increase** in mobility.

Conclusion & Policy Suggestions

The findings demonstrate that the Pink Pass policy significantly enhanced women's perceived safety and mobility in Delhi's public transport system. The safety perception among women varies notably by Pink Pass usage, with users showing consistently higher confidence in public transport. Furthermore, the increase in transport mobility is substantially higher among Pink Pass users, indicating the policy's broader role in facilitating women's socio-economic participation and empowerment. These findings suggest that expanding access to fare-free and safety-enhanced public transport policies like the Pink Pass can play a critical role in promoting inclusive urban mobility.