

Pink revolution in urban transport: Can fare-free rides improve women's empowerment? A case study of Delhi urban transport policy intervention

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Pink revolution in urban transport: Can fare-free rides improve women's empowerment? A case study of Delhi urban transport policy intervention

Dev Mani Sharma¹

Abstract

Urban transport costs and safety concerns are frequent mobility barriers for women in the global south. These concerns discourage women's social and economic participation in India. To address this, Delhi introduced the *Pink Pass policy* in 2019, offering fare-free and safer bus transport exclusively for women. Using the descriptive and normative approach, this research studies the influence of the Pink Pass policy on women's empowerment. The administrative and survey data analysis reveals a positive effect of the pink pass policy. The fare-free public transport increased women's monthly household savings between 2.79€ to 4.29€. The improved bus safety measures increased women's urban transport mobility by over 40% in the intervention period. My findings could significantly contribute to policy-making and urban development. To the best of my knowledge, this article represents the first scholarly contribution to explaining the pink pass policy to the full extent.


Keywords: Women empowerment; Urban transport mobility; public policy intervention; fare-free urban transport; transport policy; India

JEL classification: J08, J16, J18, J28, O18, R42, R48

1. Introduction

This research studies the influence of urban transport policy in empowering women in Delhi. *Women empowerment* is multi-dimensional and gives liberty in social inclusion, economic, and political areas to achieve identity (Sahay, 1998; Chattopadhyaya, 2005). Empowerment in this research focuses on the ability of women to access urban transport systems without facing barriers, thereby enhancing their social and

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economic status. Transport affordability in the global south is crucial in facilitating women's urban mobility, especially those from low-income households. *Transport affordability* refers to the financial capacity of an individual or household to afford transportation costs without mobility constraints (Carruthers et al., 2005; Dewita et al., 2020; Fan & Huang, 2011; Litman, 2020). *Mobility* is the combination of individuals travelling for work or social purposes, their transport mode, the time consumed, and the distance involved (Bissell, 2020). High fare costs disproportionately affect lower and higher-income women's ability to afford public transport. Therefore, creating affordable and gender-sensitive urban transport is crucial for consistently empowering women in social and economic life. On 29th October 2019, the state of Delhi introduced the Pink Pass Policy as a targeted intervention aimed at alleviating urban transport barriers faced by women. This policy offers all women fare-free mobility in Delhi public buses. The policy is perceived as the world's first urban transport policy intervention to provide fare-free travel only to women and promote empowerment.

2. Literature review

Several studies showed more significant social and economic challenges for women than men due to urban transport-related barriers (Njoh, 2003; Litman, 2007; Dodson et al., 2010; Turner, 2012; Uteng & Turner, 2019; Thondoo et al., 2020). In India, urban transport unaffordability and mobility safety concerns are perceived as significant barriers for women in preventing social and economic participation. Research shows that transport mobility costs restrict women's participation in the labor market (Tracey-White, 2005). A report by the World Bank (2022) confirms that the lack of mobility negatively affects women in choosing education and employment opportunities. Sub-sections 2.1 and 2.2 show studies on how the two elements of urban transportation, affordability and safety, influence women to join socioeconomic activities. The sub-section explanation provides evidence of a positive correlation between improved urban transport facilities and women's increased social and economic engagement.

2.1 Relationship between urban transport affordability and women's socioeconomic participation

Affordable urban transport is crucial for enhancing women's empowerment by increasing access to opportunities and resources. Lei et al. (2019) used the Indian Human Development Survey (IHDS) to show the influence of transport access on women's economic participation. Their findings show an increased participation in women's non-farm activities when transport is more convenient. Various studies showed a negative relationship between higher transportation costs and women's engagement in socioeconomic activities (Tracey-White, 2005b; Dominguez Gonzalez et al., 2020; Priye & Manoj, 2020). This issue is

particularly critical for women from low household income groups, where the burden of transport costs disproportionately limits their access to opportunities.

Research highlights that low urban transportation costs are key to improving low-income women's social and economic engagement. Studies consistently show a positive link between affordable transportation and enhanced access to economic opportunities for women in low-income households, underscoring its importance in fostering empowerment and participation (Muralidharan & Prakash, 2017; Cheema et al., 2022; Field and Vyborny, 2022; Shah et al., 2023). For instance, a case study of low-income women in Delhi revealed a negative correlation between higher urban transportation costs and employment opportunities (Anand & Tiwari, 2006). Uteng (2012) and Mahadevia & Advani (2016) further confirm the passive engagement of women in socio-economic activities due to expensive public transport.

A study on women in Peru finds a positive correlation between improved urban transport and labor market outcomes. The findings in Peru show that making urban transport infrastructure more convenient encourages women to join labor market opportunities (Martinez et al., 2019). Another study in Riyadh by Williams et al. (2019) highlights the positive impact of low transportation fares on women's access to economic opportunities. Analyzing Delhi's pink pass policy, Dasgupta and Datta (2023) show a positive impact of fare-free public transport in Delhi and increased employment of low-income women. The authors use a time-use survey to find increased women's paid work regarding labor force participation (extensive margin) and hours worked or earnings (intensive margin). Facing a trade-off between house rent and transportation costs, low-income women often renounce economic opportunities outside their neighborhood if the mobility costs are perceived as costly (Borker, 2024).

2.2. Relationship between urban transport mobility safety and socioeconomic participation of women

Urban transport in the global south is often perceived as an unsafe mode of public mobility. Research by Sajjad et al. (2017) reveals that women in Pakistan face numerous challenges related to safety and harassment in public transport. Western tourists often perceive travel to India with safety concerns. A travel advisory issued by a United Kingdom-based portal classified travel to India as unsafe for women (FCDO, 2025). A study by Lea et al. (2017) conducted across Indian cities, involving 1,600 respondents, reported that 35% (554 cases) had experienced sexual harassment, with groping identified as the most common form, exceeding incidents of catcalling and sexually suggestive remarks. In 2020, Delhi recorded the highest crime rate among 19 Indian metropolitan cities, with 151 cases per million population. A Delhi-based survey of 1,387 individuals found that approximately 88% of female respondents perceived Delhi's public transport

as unsafe. The data also revealed that a significant proportion of women either personally experienced or were aware of incidents of sexual harassment during their mobility. The authors highlighted that in 2014, Delhi reported 169 incidents of crime against women per 100,000 women, substantially higher than the national average of 56 incidents. The result showed a positive correlation between women's perception of threats and the actual reported incidents of harassment (Madan & Nalla, 2016).

Several studies highlight that safety perceptions of urban transport mobility influence women's choice of transportation routes and modes (Wekerle, 2005; Goddard et al., 2006; Loukaitou-Sideris & Fink, 2009; Allen et al., 2018; Orozco-Fontalvo et al., 2019; Gautam et al., 2019; Malik et al., 2020; Noor & Iamtrakul, 2023). Findings by Mitra-Sarkar & Partheeban (2011) indicate that 66% of women in Chennai experienced harassment that significantly diminished the perceived attractiveness of even the most cost-effective transportation options. These concerns further influence women's travel behaviors and route choices and increase travel time (Muralidharan & Prakash, 2017b; Cheema et al., 2022b; Field & Vyborny, 2022b; Shah et al., 2023b). Women often opt for longer but safer routes over shorter ones. For instance, a survey by Borker (2021) involving 4,000 students from Delhi University concluded that women extend their travel time by a factor of seven when choosing these safer routes.

Mobility safety concerns often deter women from using affordable public transportation, limiting their participation in socio-economic activities. Public transport-related crimes restrict women from accessing education outside residential vicinities, often sacrificing growth by choosing low-grade colleges. For instance, a study by Bhattacharya and Kopf (2017)² evidence from 2,700 Delhi female students' tradeoff for better schools and unsafe commutes. A post-pandemic study in India by Ratho and Jain (2021) shows that 52% of women have refused work or educational opportunities due to unsafe commutes in Delhi. Safety concerns remain a significant issue for women using different modes of transportation, highlighting the need for gender-sensitive transport planning to address the specific needs of women commuters. Therefore, improved urban transport is critical in addressing socio-economic participation. Sudarshan and Bhattacharya (2009) used National Sample Survey data, suggesting safe public transport as a straightforward way of improving the female workforce and social participation. Transport safety could improve women's comfort during commutes and increase access to economic growth opportunities.

3. Introduction of the Pink Pass policy

3.1 Delhi's urban transport system

² Retrieved from Borker (2017) which is unable to extract.

Taxis/ auto-rickshaws, the Delhi Metro, and public buses are the primary public transport modes in Delhi³ city. Other informal transport modes include tuk-tuk and cycle rickshaws. *Taxis*⁴⁵ are the costliest public transport modes, often unaffordable to low-income groups (*See Appendix Table IA and IB: Delhi minimum wage and monthly transport cost*). The fare structure of the Delhi Metro ranges from a minimum of Rs⁶10 (0.11€) to a maximum of Rs60 (0.64€), contingent upon travel distance. On public holidays, a discount of Rs10 (0.11€) is applied while maintaining a minimum fare threshold of Rs10 (0.11€). The state's initial proposal in 2019 for fare-free metro and public bus transport for women was accepted by bus authorities but declined by the Metro Corporation. The corporation cited concerns over potential misuse of social identity. Metro fares are managed through technology chip-based cards or coupons, which can be transferred between individuals without gender identification at metro station entry points. Implementing fare-free metro travel for women would necessitate extensive and time-intensive technological upgrades to address the gender identification challenge (Bedi, 2019). The capital state comprises two bus operators: Delhi Transport Corporation (DTC) and Delhi Integrated Multi-Modal Transit System (DIMTS). In 2019, all female passengers are granted free travel on public buses while male passengers pay fares ranging from Rs10 (0.11€) to Rs15 (0.16€) for non-air-conditioned buses and Rs10 (0.11€) to Rs25 (0.27€) for air-conditioned buses. (*See Appendix Table IC: Cost calculation of each public transport mode*).

3.2 Pink pass policy

Established in 2012, the *Aam Aadmi Political Party (AAP)*,⁷ led by Minister Arvind Kejriwal, emphasized the improvement of urban transport infrastructure during its 2013 Delhi election agendas, focusing on enhancing women's labor market opportunities. After securing victory in the 2015 election, Kejriwal reaffirmed this agenda. AAP's manifesto⁸ for the February 2020 state assembly election included a proposal for fare-free public transportation for women. On October 29, 2019, coinciding with the Hindu festival of Bhai-dooj and four months before the state assembly elections, the Government of National Capital Territory of Delhi (GNCTD⁹) implemented the *Pink Pass policy*. The reform was termed the *Pink Pass policy*, associating

³ Hereinafter, the terms state and Delhi are used interchangeably.

⁴ Not to be confused with household private vehicles owned by individuals.

⁵ For this study, private cabs like Uber and Ola are excluded, which cost a similar range of competitive fares as government (black and yellow colored) taxis.

⁶ An abbreviation of Rupees (Rs) or Indian National Currency (INR). In this paper, I use Rs or INR interchangeably. As of 21st August 2024, 1 INR=0.011 Euros

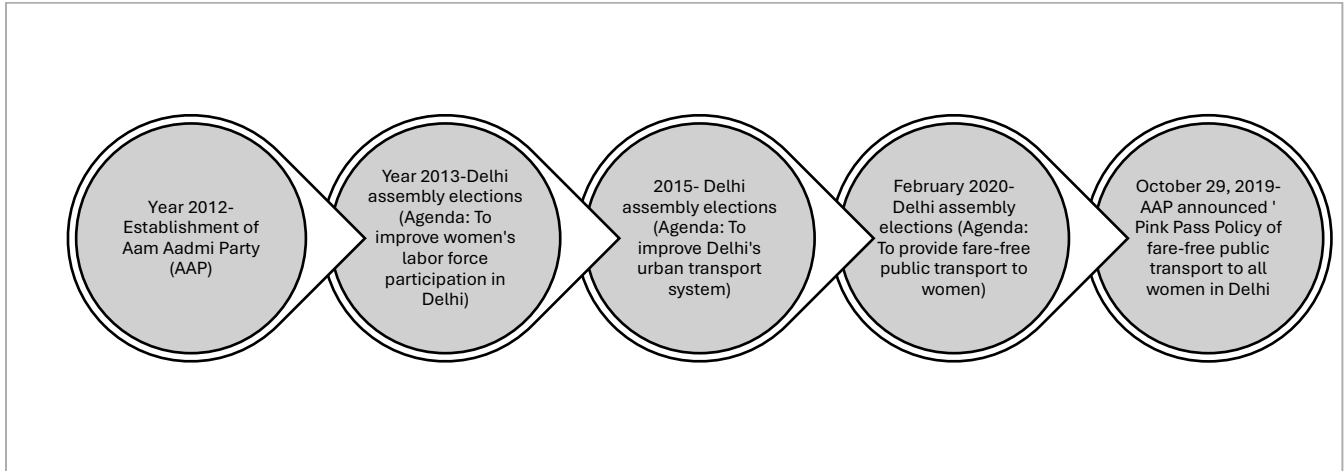
⁷ <https://aamaadmiparty.org/>

⁸ <https://aamaadmiparty.org/manifesto2020/>

⁹ GNCTD is an abbreviation and synonym used for Delhi state or Delhi government. In this research, I use these terms interchangeably.

pink colour bus tickets with the stereotypical feminine colour. Fig. 1 shows the process involved in implementing the pink pass policy.

Fig. 1. Pink-pass policy implementation process



Source: Author

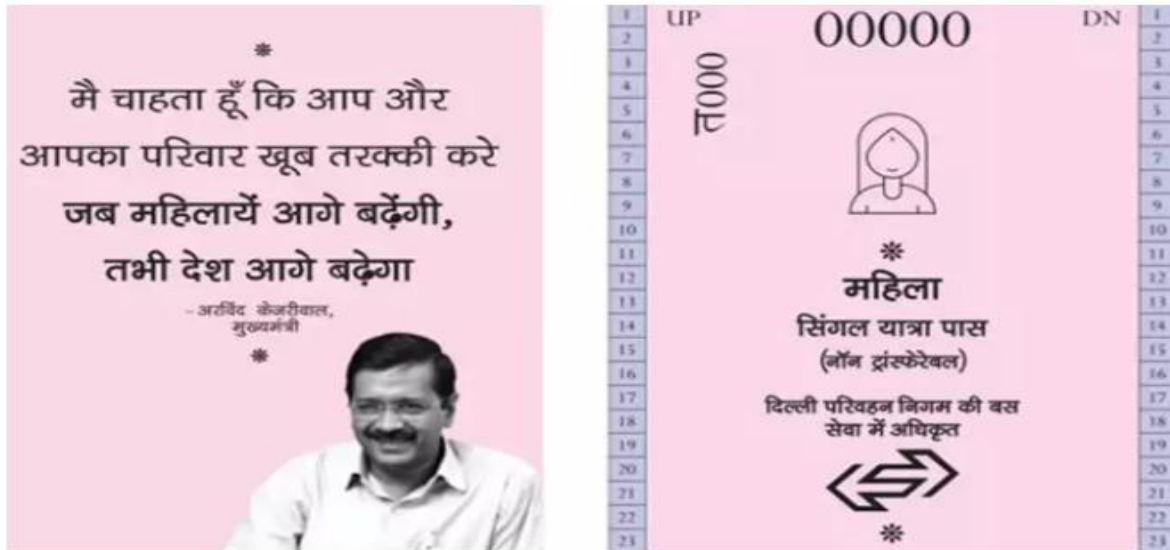
All women boarding the buses may obtain the paper-form pink pass from the bus staff. Women passengers may obtain the physical ticket from the bus staff or download the e-pink pass either from *One Delhi* mobile application.¹⁰ A serial number pink pass is valid only for a specific bus route and requires a new pink pass for changing buses for *chain trips*. *Chain trips* include one trip from the original location to the destination using multiple transport modes. The pink pass scheme grants fare-free travel while permitting bus authority inspectors to conduct random ticket checks to prevent misuse related to gender identification.

This will prove to be a crucial step in the direction of women's respect, safety, empowerment and realization of their dreams. By freeing public transport for women, I am allowing them to realize their dreams of studying in schools and colleges or working in faraway areas (Mathur & India, 2019).

The policy objective is to provide women with *affordable* and *safer* public transportation. Delhi state provided theoretical explanations that the pink pass scheme would bring more women out of their dwellings to engage in socio-economic activities, which may contribute to the empowerment of Delhi women. Fig. 2 shows a pink pass sample image describing the text printed [in Hindi] on the front and back.

¹⁰ <https://ddc.delhi.gov.in/events/launch-one-delhi-app>

Fig. 2. Pink-pass sample of DTC buses



Source: (Navbharat Times, 2019)

Note: The original text is in Hindi and translated into English according to the author's description.

Description: Text on the back side of the pink pass (left image); 'I want you and your family to develop- When women progress, only then will the country progress'- Arvind Kejriwal, Chief Minister (with a photo of Arvind Kejriwal). Text on the front side of the pink pass (right image);- a five digits unique identification serial number followed by the text "Women single travel pass (non-transferable)- Delhi Transport Corporation- Issued in service- DTC logo (right and left arrow symbols). The asterisk (*) symbol represents the borders' numbers denoting the bus stops of the route-up and route-down to which the pass is taken for both directions.

As of August 2022, the scheme applied to all women, including transgender¹¹ individuals. By 2024, six Indian states—Punjab, Tamil Nadu, Kerala, Himachal Pradesh, Karnataka, and Telangana replicated the pink pass policy and introduced fare-free public bus transport policies for women to improve empowerment. In *Punjab* state, the Indian National Congress political party implemented a fare-free public bus policy on April 1, 2021, one year before the February 2022 state elections. The reform sought to enhance women's economic participation by providing affordable transportation. Despite this initiative, the Indian National Congress lost the elections to the Aam Aadmi Party (AAP) political party (Chaba, 2022). The reform aimed to promote female economic activities by providing affordable public transportation (Express News Service, 2021). Under this policy, women in Punjab can travel free of charge on state-owned, non-air-conditioned buses.

¹¹ The state extended the pink pass policy to include transgenders in February 2024.

Tamil Nadu state DMK political party implemented the *Zero-Ticket Bus Travel (ZTBT)* scheme on May 7, 2021, one month after the April 2021 elections. ZTBT scheme provides fare-free mobility in non-air-conditioned buses up to 30 kilometres per day in state-owned Tamil Nadu State Transport Corporation (TNSTC) to women, transgender people, and people with 40% disability. The scheme aimed to empower women by increasing social well-being and labor market participation (Durai, 2021)

Kerala state *Left Democratic Front (LDF)* political party launched the *Samudra [Sea in English] Bus Service* on August 29, 2021, four months after the August 2021 elections.¹² The state provides three fare-free buses between 5 am and 10 pm to women fish vendors from coastal areas to the city and extended the scheme benefits for low-income family students in November 2023 (TNN, 2021 & Pegu, 2025). It aimed to alleviate the monthly financial burden of Rs400-500 (€4.45-€5.55) for such female groups. The results of the scheme are unavailable due to the data constraints.

Himachal Pradesh state adopted the *Naari ko Naman [Salute to women in English]* scheme on June 30, 2022, five months before the November 2022 elections (PTI, 2024). The scheme offers mobility affordability by providing 50% discounted bus fares for female passengers. The state hired 25 female drivers under the *Ride with the Pride* government taxi service scheme. Media reports highlighted the scheme's positive impact on women's access to education and employment opportunities, emphasizing its role in enhancing financial independence.¹³

The May 2023 Karnataka state elections manifesto headlined the fare-free bus rides for all women (Kumar, 2023). Indian National Congress political party won the polls and implemented a *Shakti [Strength in English]* women-exclusive fare-free bus scheme in Karnataka on June 11, 2023. *Shakti* scheme offers women fare-free mobility on state-owned non-air-conditioned buses. Indian National Congress political party recited Karnataka state's successful *Shakti* scheme in *Telangana* state's November 2023 election manifesto (Gautam, 2023). The party won the polls and implemented a *Maha Laxmi [Super Wealth in English]* Scheme on December 9, 2023, to provide fare-free bus rides to all females.

Delhi set a precedent with fare-free bus rides to empower women and extend the policy values to other states. Fig.2 presents a geographic representation of Indian states implementing the pink pass policy or similar fare-free public transportation initiatives.

¹² Kerala Assembly Elections 2021 | LDF manifesto balances growth, social welfare - The Hindu

¹³ <https://whatsinthenews.org/nari-ko-naman-empowering-women-through-accessible-transportation-869>

4. Data, Methodology and Analysis

This research integrates both administrative and survey data as follows:

4.1 Administrative data: Administrative data includes the Economic Survey of Delhi, 2016-2023 and the Employment Survey of Delhi, 2020. The Economic Survey of Delhi is an annual survey conducted by the Delhi Planning Department, consisting of statistics on Delhi's bus fleet size, deployment of marshals in public buses, allocation of funds for the pink pass scheme, and yearly pink pass users. The State of Delhi conducted an employment survey of Delhi in 2020 after the COVID-19 outbreak, focusing on job loss in various economic activities. The survey consists of statistics on literacy level, age classification and working status after the policy implementation. The Centre for Market Research and Social Development conducted an Employment Survey in Delhi (2020).

4.2 Transport Authority data: As of June 2023, Delhi operates 36 Delhi Transport Corporation (DTC) bus depots covering 606 bus routes. The author asked all 36 bus depots the following questions by filing an online application at the Right to Information (RTI) portal¹⁴: (a) How many women travelled on Delhi public buses from 1st January 2016 to 29th October 2019 before the pink pass policy? (b) How many women travelled in Delhi public buses from 29th October 2019 till 31st December 2023 after the pink pass public buses? (c) Before the policy implementation, how many passengers travelled on Delhi public buses from 1st January 2016 to 28th October 2019? (d) How many passengers travelled on Delhi public buses from 29th October 2019 till 31st December 2023 after the policy implementation? (e) How much does Delhi state provide the yearly subsidy to Delhi Transport Corporation (DTC) for pink passes? RTI provided paper-based data on questions *b*, *c*, *d* and *e* on 26 bus routes (Table I).

Table I. Details of Pink pass user data on 26 bus routes

26 bus depot in Delhi	Data type	Data type description
20 bus depot information	Combined data	Combined data shows the total sum of female passengers after the policy implementation until the 30th of September 2023.
1 bus depot information	Yearly data	which includes the total number of female passengers travelling after the policy implementation from 29th October 2019 to 31 st December 2019, 1 st January 2020 to 31 st Dec. 2020 and so forth...until 30 th Dec. 2022.

¹⁴ <https://rtionline.gov.in/index.php>

1 bus depot information	Half-yearly data	which includes the total number of female passengers who travelled every six months after the policy implementation from October 2019 until September 2022.
4 bus depot information	Monthly data	This includes the total number of female passengers who travelled after the policy implementation each month from 29 th October 2019 until 30 th September 2022.

Source: Delhi Transport Corporation (2023) retrieved from the Right to Information Portal.

4.3 Delhi Women Survey 2023 (DWS, 2023): The survey, designed using Qualtrics software, was administered through the Open Data Kit (e-ODK) method on mobile phones and tablets. The author engaged an Indian company to collect data from July to September 2023. The Indian company used a random sampling method by surveying several locations in Delhi, such as crowded areas like flea markets, pedestrian zones, women outside the metro stations, and bus stops, and it also conducted door-to-door home visits. The survey criteria involved all women and transgender from 15 to 65 years old, with a sample size of n=2,038. The software measured an average time of 11-13 minutes for women to complete the survey with a fair score indicator. The dataset comprises a representative sample of Delhi's general population, with 2,142 respondents, including 2,041 women and 10 transgender individuals. For this research, I utilize a subset of the data (n=2,051), which includes both women and transgender participants. Each respondent completed four sets of questions, comprising 18 questions on employment, 33 on transport and mobility, six on social and cultural norms, and seven on personal information. A total of 194 sub-questions focused on comparing conditions before and after implementing the Pink Pass reform. The survey design incorporated advanced features such as display logic, skip logic, and carry-forward choices. The responses were collected using multiple formats, including multiple-choice, likert scale sliders, ranking order, text entry, and matrix tables, with a CAPTCHA feature to prevent repetitive entries. The survey variables were aligned with those used in the National Sample Survey Office (NSSO) labor survey in India.

Table II. Representation of Delhi women survey (2023) with Employment survey of Delhi (2020) classifying age groups, literacy level and working status.

Variable	Classifications	ESD (%)	DWS (%)
Literacy Level	Illiterate	18	3
	Primary	30	1
	Secondary	35	7
	Graduate and above	16	9

Age groups

15-25 years	31	73
26-30 years	14	10
31-40 years	24	6
41-50 years	16	7
51-60 years	10	3
Above 60 years	6	1

Working status

Working	10	24
Non-working	90	7

Source: own elaboration based on Employment survey of Delhi, 2020 and Delhi women survey, 2023

Note: (i) Literacy level is classified into primary education, which consists of education that is lower than the 5th standard, 5th pass, or 8th pass standard. Secondary education includes pursuing or passing 10th or 12th standard school, while graduate includes pursuing or above graduation degree). Literacy level is represented by the Economic Survey Delhi (ESD), 2020; (ii) Literacy level in Delhi Women Survey (DWS), 2023 consists of primary education with the population pursuing or pursued primary school but never pursued secondary school, secondary education means pursuing or pursued education up to 12th grade but never pursued graduation, and graduating means the respondents pursuing or pursuing bachelor education or above; (iii) Employment survey of Delhi (ESD) data is based before CORONA (Jan/ Feb 2020). In ESD and DWS, working means the working population at the time of the survey. In contrast, non-working means the population is not engaged in the working activity, which includes unemployed-unavailable work and unemployed-available work.

This research methodology employs both descriptive and normative approaches. I observe the current state of affairs of the pink pass policy, describe the state claims and analyze the administrative and survey data to interpret the policy results. My approach focuses on establishing norms derived from the research findings.

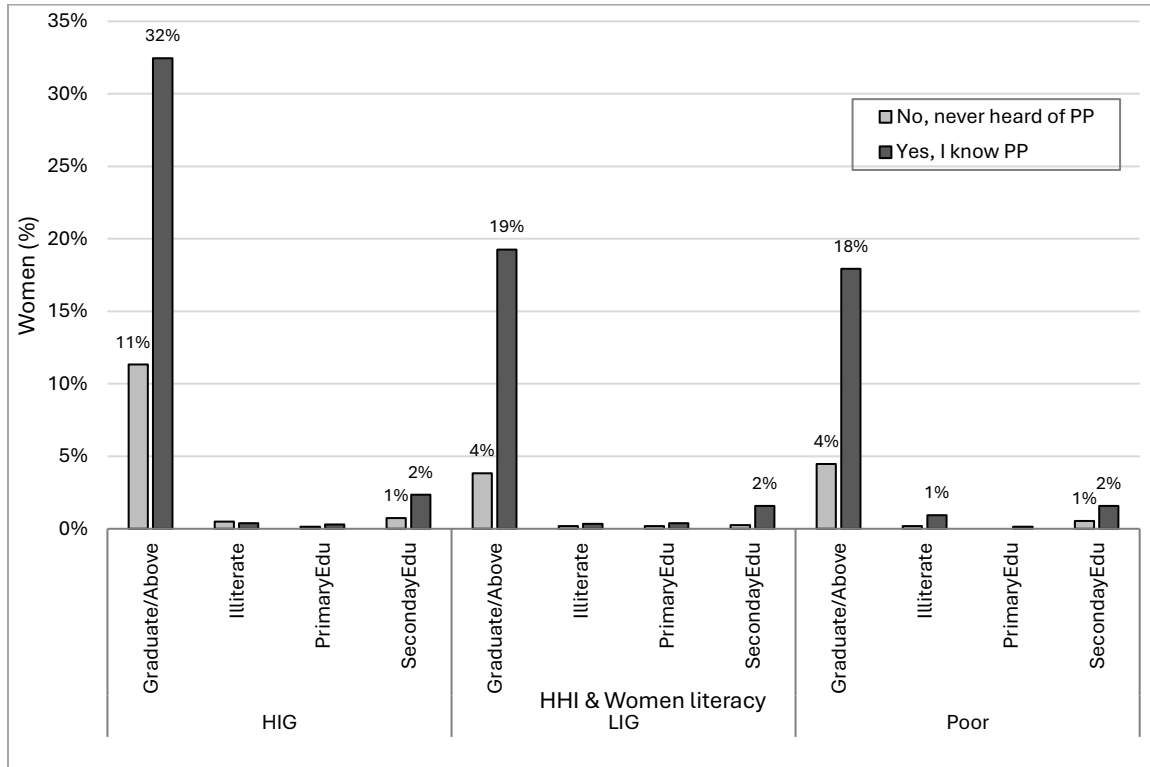
5. Challenges of the Pink Pass Policy

The state, Delhi's women, and transport authorities constitute three policy actors. This section examines externalities, quality measures, and the challenges these actors encountered during the pink pass policy implementation. Notably, a report by an Indian media agency suggested that introducing the pink pass policy just four months before the elections may have been politically motivated, aimed at garnering the support of female voters (Nachi, 2019)

5.1. Policy instrument effect: Pink pass awareness

The state employed media as a key instrument to raise awareness of the pink pass policy. Information regarding the policy was disseminated through social media platforms¹⁵, newspapers, and radio channels and presented as a public interest announcement. Utilizing data from DWS (2023) in Fig. 3, I examine the impact of these policy instruments on Delhi women, analyzing their awareness levels concerning literacy and household income (HHI).

Fig. 3. Policy instrument effect



Source: Own elaboration based on DWS (2023)

Survey question: Have you ever heard of pink passes for public buses?

Note: A total of 2,040 women, aged 15 and above, responded to the survey question regarding their awareness of the pink pass policy; (ii) Respondents' answers were categorized as: (a) "Yes, I know what it is," (b) "No, I have never heard of it," and (c) "Yes, I have heard of it, but I am unsure what it is." For analytical purposes, responses (a) and (c) were merged into a single category: "Yes, I know pink passes (PP)"; (iii) The y-axis represents the percentage of women respondents; (iv) The x-axis categorizes the literacy levels of women into four groups: Graduate or above, illiterate, primary education, and secondary education. Household income (HHI) is segmented as follows: Poor (< Rs16,000 to Rs22,000), Low-Income Groups (LIG, Rs22,000 to Rs40,000), and High-Income Groups (HIG, > Rs40,000).

¹⁵ https://twitter.com/AamAdmiParty?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor , <https://www.facebook.com/AamAdmiParty/>

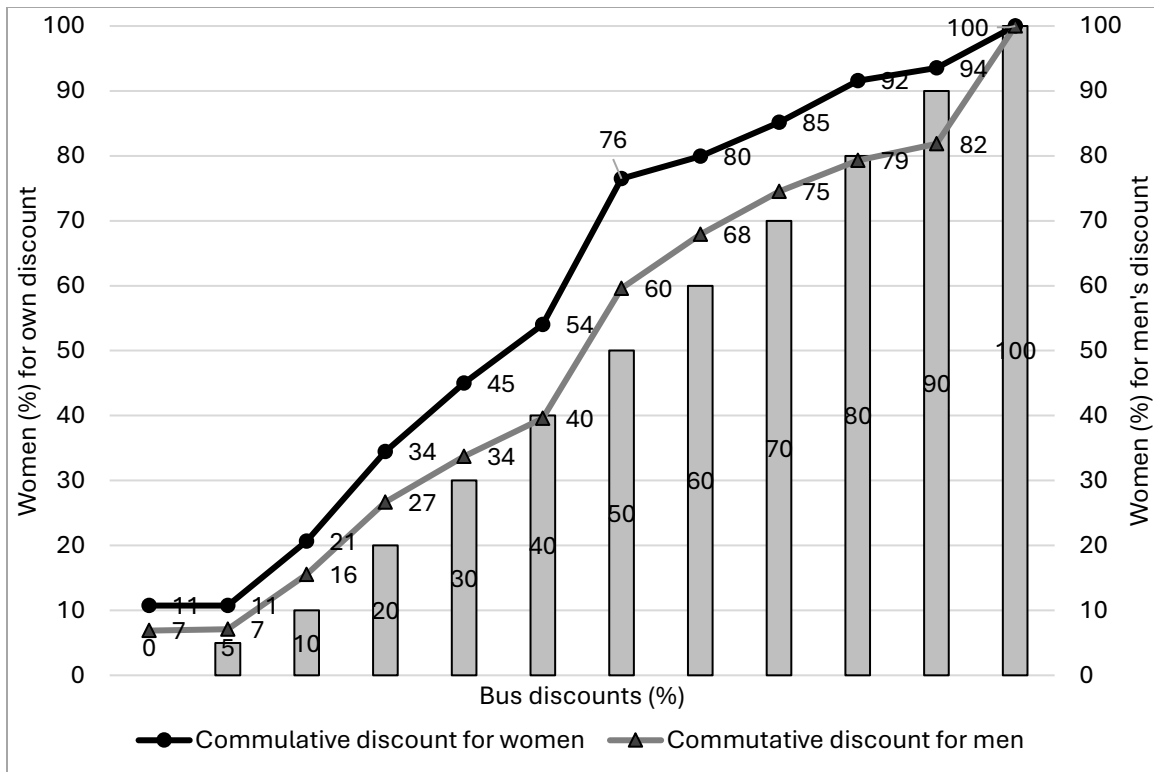
Fig. 3 illustrates the awareness of the Pink Pass policy among Delhi women, classified by their educational attainment and household income group (HIG, LIG, Poor). The data showed that highly educated women have more awareness of the pink pass across all income categories; (i) Among the high-income group (HIG), over 30% of women with graduate or above education level are aware of the pink pass policy. Illiterate women, primary and secondary educated women show minimal awareness; (ii) In the lower-income group (LIG), graduate or above education level women show the highest awareness with 19%; (iii) For the poorest group, awareness level is 18% for graduates, compared to 4% among those with secondary education, and an even smaller percentage of awareness among the illiterate or less educated; The graph suggests that both education and income influence the effectiveness of policy awareness, with lower awareness levels seen among women with lower literacy and in poorer households.

5.2. Equitable distribution of Pink Pass benefits

A section of Delhi's women expressed concerns regarding the pink pass policy by highlighting its potentially adverse effects on gender equity (Observatory of Public Sector Innovation, 2023). Critics argued that the policy disproportionately benefits women over other marginalized groups, such as individuals with disabilities and economically disadvantaged populations. A study by the (Kar et al., 2020) revealed that 54% of disabled women in India frequently rely on public transportation, with 67% facing infrastructural barriers. A female lawyer challenged the pink pass policy in court¹⁶ on the grounds of unconstitutionality, gender bias, economic irrationality, principles of equity and economic efficiency. Anecdotal evidence shows women's support of affirmative action and a more inclusive policy approach by suggesting fare-free or discounted public transportation for men (Yadav, 2019). Fig.4 explores this anecdotal argument by examining the potential impact of extending the pink pass policy to men.

Fig. 4. Affirmative action on Bus fare discount.

¹⁶ Delhi High Court.



Source: Own elaboration based on DWS (2023)

Survey question: How much of a bus discount do you want for men and yourself?

Note: (i) A sample of 2,041 women aged 15 and above responded to the survey question; (ii) The chart illustrates women's preferences for bus fare discounts classified by gender. It shows the cumulative percentage of women in favor of discounts for themselves versus discounts for men, across different levels of bus fare reductions. The x-axis represents the percentage of the bus fare discount, while the y-axis shows the cumulative percentage of women supporting these discounts; (iii) Two distinct lines track preferences: the black line indicates the cumulative percentage of women supporting discounts for themselves, while the grey line indicates the cumulative percentage supporting discounts for men.

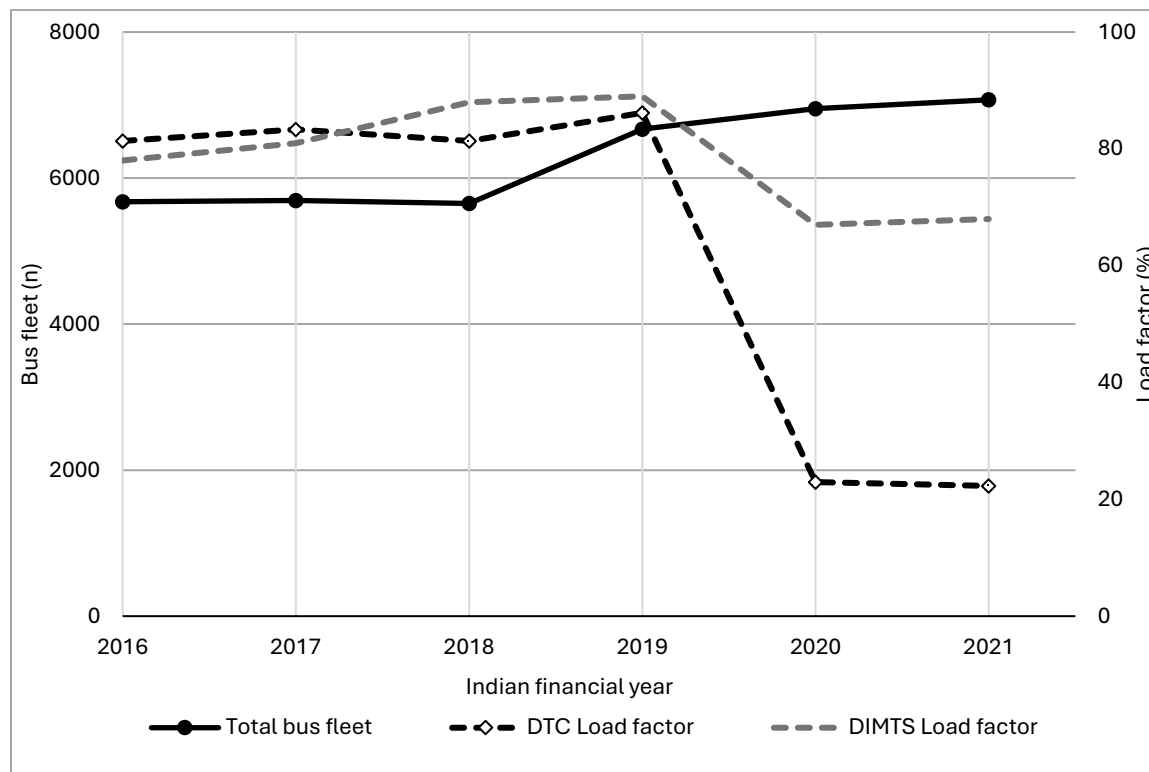
Fig.4 shows that women prefer higher bus fare discounts. For instance, 76% of women prefer receiving a 50% discount on fares for themselves, while 60% support such discounts being offered to men. The figure rejects the anecdotal argument on affirmative action and policy inclusion for men.

5.3. Policy quality estimation: Challenge of overcrowded buses

Governments often subsidize public goods to enhance social welfare. However, the full subsidization of public buses may increase demand for bus fleets. Delhi's population of 29,259.12

individuals per square mile¹⁷ significantly contributes to overcrowded public buses, intensifying urban transport as a less secure option for female commuters. Overcrowdedness may prompt women to opt for alternative urban transport modes, such as taxis and metro. Such alternative transport modes are relatively faster and safer, but more expensive for low-income groups. For instance, the Delhi Metro¹⁸ is perceived as safer but more costly than buses (Gopal & Shin, 2019). (OMI Foundation, 2023) compiled survey responses from 11,636 women across 14 Indian cities. The responses show that 40% of women considered metro transport unaffordable in 2022. Fig.5 illustrates the state's approach to mitigating bus overcrowding by expanding the fleet. The analysis evaluates bus congestion levels before and after the pink pass policy's implementation, using the passenger load factor as a key indicator (see Appendix Table III for the load factor calculation).

Fig. 5. Bus fleet size before and after the pink pass reform



Source: Own elaboration based on Economic Survey of Delhi (2016-2023)¹⁹

Note: (i) 2019 is the intervention year of the pink pass policy introduction; (ii) The primary y-axis denotes the total Delhi bus fleet size, and the secondary y-axis shows the load factor²⁰; (iii) The x-axis represents Indian financial years

¹⁷ <https://worldpopulationreview.com/cities/india/delhi>

¹⁸ See Appendix Table IB: Monthly transport cost calculated for 10 kilometers

¹⁹ See Appendix 1 Note 1 Description of Indian financial years

²⁰ Passenger load factor is alternatively referred as a level of bus congestion

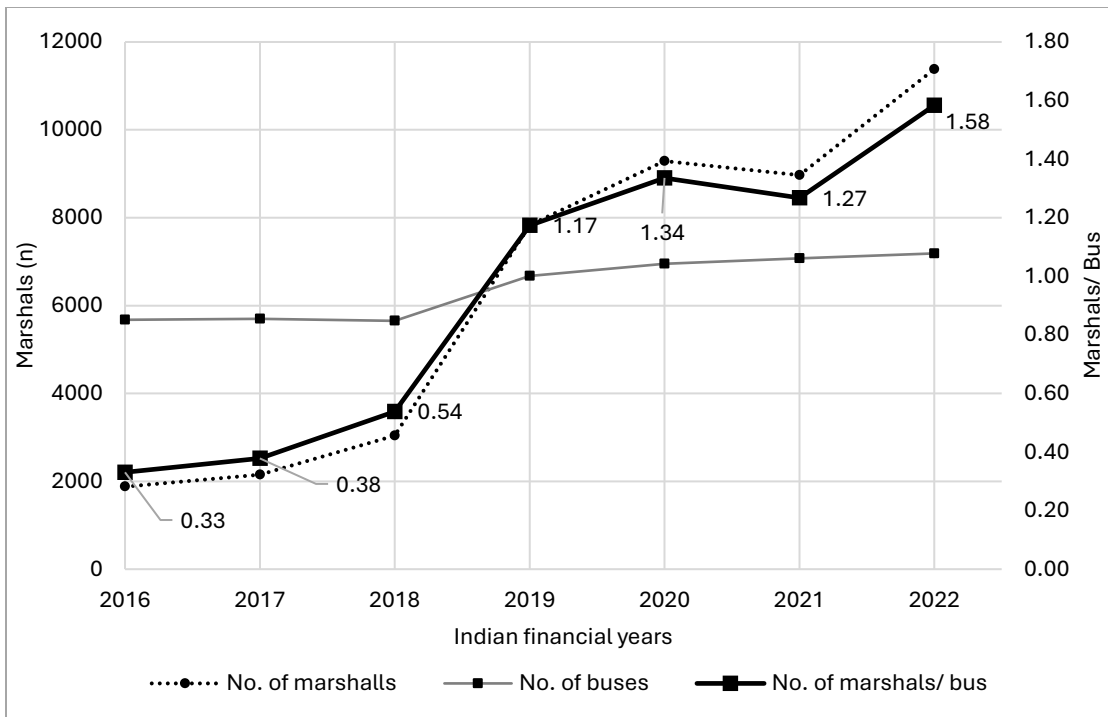
before and after the pink pass policy implementation; (iii) The figure relationship between the total bus fleet size and load factors for the Delhi Transport Corporation (DTC) and the Delhi Integrated Multi-Modal Transit System (DIMTS) from 2016 to 2021.

Fig.5 shows that the state increased the bus fleet size in 2018, which subsequently decreased the load factor in Delhi Transport Corporation (DTC) and Delhi Integrated Multi-Modal Transit System (DIMTS) buses, solving the congestion after the reform.

5.4 Estimating urban transport safety: Challenge of providing safer buses

The research established a positive correlation between overcrowded fleets and rising crime rates, posing safety concerns, particularly for women (Smith & Clarke, 2000; Parikh, 2018; Ceccato & Nalla, 2020). In response to these concerns, several Indian states have implemented targeted safety measures. In 2013, Delhi allocated Rs15 billion (16.09€ billion) to the *Nirbhaya Fund* under the Gender Sensitization Program. The program aimed to enhance safety in public transport by equipping buses with Global Positioning Systems (GPS) and security cameras and employing female drivers to foster a sense of security among women passengers. The state introduced the Bus Marshal Scheme in 2015 and deployed bus marshals to safeguard women and children on Delhi buses (Fig.6). Bus marshals are skilled civil defense volunteers identified by greenish-brown uniforms like local Delhi police. The daily wages for a bus marshal range from Rs667 (7.33€) to Rs917 (10€), contingent upon the individual's experience level. The added safety measures show the state's efforts to improve public bus safety to promote a secure environment for female transport mobility.

Fig.6. Deployment of bus marshals.



Source: Own elaboration based on Operational statistics of Delhi Transport Corporation (DTC), Economic Survey of Delhi (2016-2023).

Note: (i) 2019 is the intervention year of the pink pass policy introduction; (ii) The primary y-axis denotes the total number of bus marshalls, and the secondary y-axis is the availability of the number of marshalls in each bus; (iii) The x-axis represents Indian financial years before and after the pink pass policy implementation; (iv) The line graph depicts the trends in the number of marshalls, buses, and the ratio of marshalls per bus over the Indian financial years from 2016 to 2022; (v) The dotted line represents the number of Marshalls over the years; (vi) The solid line of marshalls per bus-ratio also represents an upward trend, suggesting an improvement in the allocation of marshalls per bus.

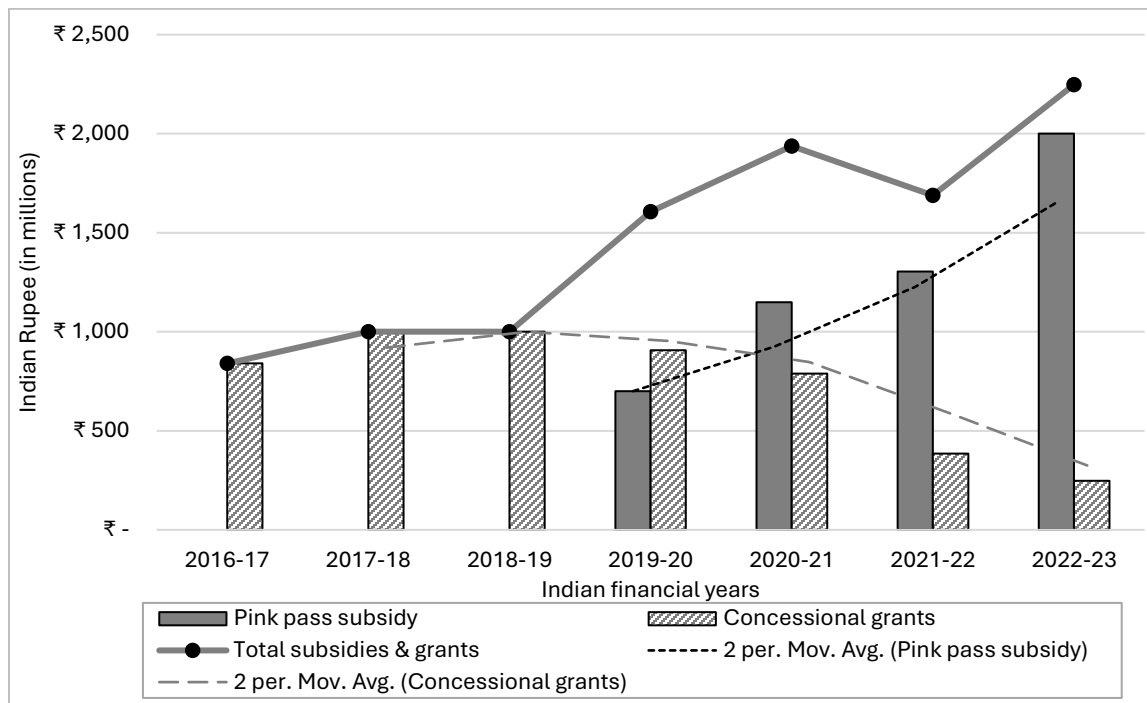
Fig.6 shows a sharp rise in the deployment of bus marshalls after the policy implementation. The 2019 intersection indicates a shift, with the number of marshalls surpassing the state bus fleet. By March 31, 2022, Delhi state deployed over 10,000 marshalls, with more than 50% of these deployments occurring since 2018. Until 2022, each public bus will have at least one bus marshal to enhance the safety of female passengers. The increasing number of marshalls and the ratio of marshalls per bus imply enhanced safety measures in Delhi public buses.

5.5. Policy financing challenge

Delhi state offers concessional bus passes to students, disabled individuals, senior citizens, and freedom fighters by compensating transport companies. From October 2019, the state reimburses bus transport companies Rs10 (€0.11) for each pink pass a female passenger uses. The government

projected that the bus fare subsidy program would impose a cost of Rs. 3,000 million (€33.4 million) on the state exchequer (Mathur, 2019). Kębłowski (2019) argues that fare-free urban transport presents significant challenges concerning the economic, social, and political dimensions of urban governance and stability. By examining the subsidies for both concessional and pink passes, this study estimates the state's financial obligations to subsidize bus companies under these initiatives (Fig.7).

Fig. 7. State’s allocation of funds under pink pass and concessional scheme



Source: Operational statistics of Delhi Transport Corporation (DTC), Economic Survey of Delhi (2020-2023)

Note: (i) The financial year 2019-20 marks the period of policy intervention; (ii) The data presented includes figures exclusively for the Delhi Transport Corporation (DTC) and omits the DIMTS (Delhi Integrated Multi-Modal Transit System) subsidy due to data limitations; (iii) The y-axis represents the pink pass subsidies and concessional grants provided by the Delhi state government; (iv) The x-axis illustrates the Indian financial years preceding and following the implementation of the pink pass policy; (v) The 2-period moving average (2 per. Mov. Avg) is calculated based on a two-year moving average methodology.

The key observations from Fig.7 include: (i) *Pink pass subsidy*: Introduced during the financial year 2019-20 (the year of intervention) and increased significantly subsequently, peaking in 2022-23. An increased Pink Pass subsidy suggests a growing financial commitment by the government to support the Pink Pass initiative; (ii) *Concessional grants*: Represented by striped

bars, concessional grants remain relatively stable before 2019-20 but show a decline in the Pink Pass policy intervention period. It indicates a shift of subsidy funds from concessional grants to the pink pass subsidies; (iii) *Total Subsidies and Grants*: The line depicting total subsidies and grants shows an increasing trend, particularly post-2019-20. It indicates an increase in the state's contribution to transportation subsidies and grants; (iv) *Moving Averages*: The graph also includes two-period moving averages (2 per. Mov. Avg) for both the pink pass subsidies (dashed line) and concessional grants (dotted line). While the moving average for pink pass subsidies reflects a sharp upward trend following the policy's implementation, the concessional grants' moving average shows a downward trajectory. Fig.7 shows the financial shift and prioritization by the Delhi government towards pink pass subsidies following the policy's introduction in 2019-20, accompanied by a gradual reduction in concessional grant allocations that raises concerns about the long-term feasibility of sacrificing concessional grants.

6. Results: The impact of the Pink Pass policy

This section shows the organized results of the policy effect. Delhi's pink pass policy enhanced employment among women from economically marginalized groups by increasing labor force participation by 24 percentage points at the extensive margin and work duration by 150 minutes at the intensive margin (Dasgupta & Datta, 2023b). Administrative data revealed a positive economic impact of the pink pass policy with a monthly increase in household savings between Rs260 (2.79€) and Rs400 (4.29€) (Goswami, 2021). Sub-sections 6.1 and 6.2 show a descriptive trend of women's urban transport mobility in Delhi before and after the policy implementation.

6.1. Administrative data

Government data indicate an increase in women's bus ridership from 33% pre-implementation to 40% in the intervention period (Observatory of Public Sector Innovation, 2023b). The number of pink pass users reached over 1 billion²¹ from the policy implementation until January 2023 (Raj, 2023). The state recorded over 1.6 billion²² pink pass users from 2019 to 2020 before the pandemic

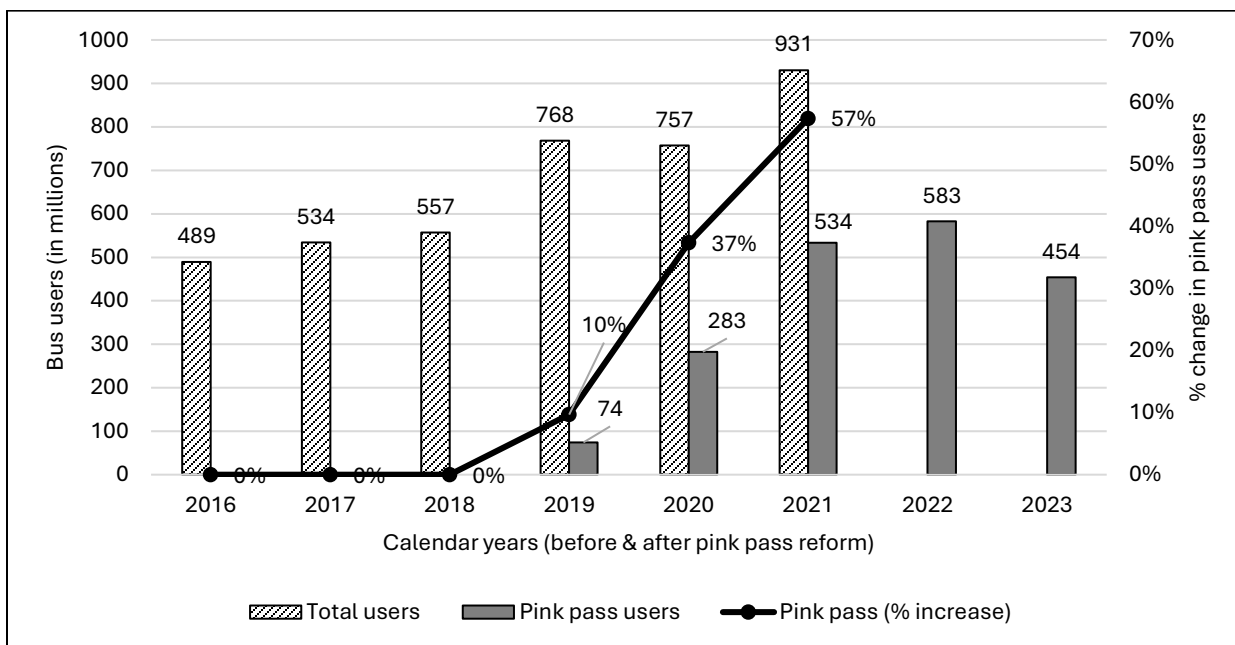
²¹ Changed from Indian Rs100 crore. Also see Appendix 1 Table VI: Conversion of units from Indian accounting term to international accounting term.

²² Changed from Indian Rs160 crore. Also see Appendix 1 Table VI: Conversion of units from Indian accounting term to international accounting term.

lockdown, 710 million with 25% growth during the 2020-2021 pandemic lockdown. The pink pass users increased to 1.25 billion²³ with 28% growth during the 2021-22 post-pandemic era and 33% until February 2023 (Jain, 2023). The state's data recorded over 4 million²⁴ daily pink pass users and over 1,000 million pink passes between October 2019 and January 2023 (Raj, 2023b). Women's mobility in Delhi public buses increased by 10% post-treatment (Chen et al., 2024).

Fig. 8 compares the women pink pass users with total bus passengers before and after the policy implementation. Meanwhile, Fig.9 shows monthly numbers of women's pink pass users after the policy implementation.

Fig. 8. Impact of pink pass policy: Yearly trend of bus mobility before and after the policy



Source: Own elaboration based on Operational statistics of Delhi Transport Corporation (DTC), Economic Survey of Delhi (2016-23), Delhi government performance report (2015-2023).

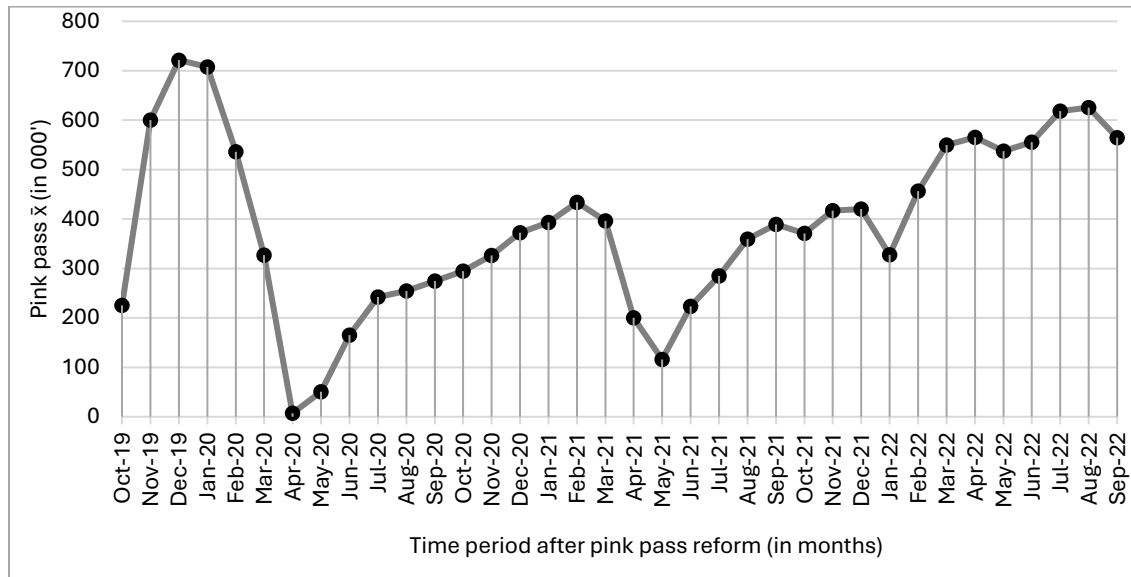
Note: (i) The calendar year 2019 marks the policy intervention; (ii) the data reflects only DTC buses, excluding DIMTS data; (iii) the left y-axis represents the total number of bus users (in millions), while the right y-axis shows the percentage change in pink pass users, with the number of women passengers estimated based on pink pass issuance; (iv) total passenger figures for 2022 and 2023 are unavailable due to data constraints.

²³ Changed from Indian Rs125 crore. Also see Appendix 1 Table VI: Conversion of units from Indian accounting term to international accounting term.

²⁴ Changed from Indian Rs40 lac. Also see Appendix 1 Table VI: Conversion of units from Indian accounting term to international accounting term.

Fig.8 illustrates the trend in bus users from 2016 to 2023. It shows an increase in total bus users from the policy intervention year 2019. Pink pass users increased by over 50% from 2019 to 2020, demonstrating an increase in female passengers. By 2021, almost 57% of women used the pink pass policy for transport mobility. Fig. 8 highlights the significant impact of the pink pass reform among women, showing a sharp increase in the early years.

Fig. 9. Impact of pink pass policy: Monthly trend of bus mobility after the policy



Source: Own construction based on Delhi Transport Corporation (2023) retrieved from the Right to Information Portal.

Note: (i) The figure shows the monthly number of pink pass users since the policy inception until the data provided September 2022; (ii) the figure has data only for DTC buses and excludes data for DIMTS; (iv) The y-axis represents the number of pink passes users of four Delhi bus routes²⁵, while the x-axis denotes the period (in months) post-reform.

The monthly trend data in Fig. 9 shows a swift increase in pink passes immediately after the policy's implementation. A drop in pink pass users in early 2020 is likely due to the onset of the COVID-19 pandemic. The data reflect that, irrespective of the exogenous shocks such as the COVID-19 pandemic, the pink pass continued to promote women's public transport usage (*See Appendix Table III: COVID-19 Lockdown in India*). The policy enhanced women's mobility in exploring labor market opportunities in the labor market. For instance, the Delhi state predicted a higher women's workforce participation rate and announced the policy's successful continuation for the financial year from April 1, 2023, to March 31, 2024.

²⁵ Data includes four Delhi bus depots named: Vasant Vihar, Sri Niwas, Dwarka and Dwarka Sector-2

Our findings from the administrative data show similar results to those of the schemes in the other states of India. Punjab state reported that female urban transport mobility doubled by November 2022 (Singh, 2022). The Tamil Nadu state's ZTBT scheme saved the monthly disposable income of women by up to Rs1,012, improved socio-economic engagement and education opportunities, and increased bus ridership by 40%-60% (Pegu, 2025b). In 2023, a survey in Tamil Nadu confirmed an increase in monthly savings of 3,000 women from Rs400-Rs1000 (€4.45-€11) (Citizen Consumer and Civic Action Fair Fares: Towards Gender Inclusive Public Transport Report, 2023). The survey further revealed increased bus mobility and monthly savings on household and education developments. Karnataka Road Transport Corporation (2023) reports a 75% increase in female daily mobility from 8.2 million before the Shakti scheme to 11 million by July 2023 (BP, 2023). The Maha Laxmi scheme of Telangana state claimed to save over Rs11 billion (€122 million) in household income until April 2024 (Pegu, 2025c).

7. Conclusion

This research strongly links fare-free public transport and women's empowerment, demonstrating how such policies enhance women's access to mobility, ensure safer travel, and promote financial independence. By reducing economic barriers and addressing safety concerns, fare-free urban transport enables women to engage more actively in social and economic activities, fostering greater inclusion in urban spaces. By integrating these findings, urban transport policies can be strategically designed to foster a more inclusive urban environment. Policymakers can leverage these insights to develop gender-sensitive transport systems that enhance and support women's economic participation. By addressing women's urban transport mobility needs, such policies can build inclusive transport systems that empower women and contribute to sustainable urban development. The policies may align with broader goals of social equity and urban resilience.

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Appendix

Notes

1. *Indian financial year*- A year starting from 1st April and ending 31st March the following year. For example, in Fig.5, the data in 2019 belongs to the financial year starting 1st April 2019 to 31st March 2020, and the data in 2021 belongs to the financial year 1st April 2021 to 31st March 2022.
2. *Calendar year*- A year starting from 1st April and ending 31st March the following year.

Table IA Delhi minimum wage

Employment category	In Rupees changed to Euros (Exchange rate as of 21 st August 2024)	
	Per-month	Per-day
Unskilled	17,494 (187.76€)	673 (7.22€)
Semi-skilled and matriculate	19,279 (206.01€)	742 (7.96€)
Skilled, matriculate but not graduate	21,215 (227.70€)	816 (8.76€)
Non-Graduate and above	23,082 (247.74€)	888 (9.53€)

Source: Government of NCT of Delhi, Labor Department (2023)²⁶

Table IB Monthly transport cost calculated for 10 kilometers²⁷ (6.21 miles)

	Transport modes		
	Taxi	Metro	Buses
Men	12,600 (135.24€)	1,800 (19.32€)	600 (6.44€)
Females	12,600 (135.24€)	1,800 (19.32€)	0

Source: Own construction based on Table IC

Table IC Cost calculation for each public transport mode for 10 kilometres²⁸.

<p><i>Taxis</i></p> <p>An individual spends Rs185 on a taxi for a 10 kilometer (km) ride.</p> <p>Rs40 (first km) +Rs17 (each km) x10 (Km)= Rs210</p>
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²⁶ <https://labour.delhi.gov.in/labour/current-minimum-wage-rate>

²⁷ Based on 30 days of the month and two rides a day.

²⁸ 1 kilometre (km)= 0.621 miles(m)

Delhi Metro

An individual spends Rs30 on the Delhi metro for a 10 km ride.

Delhi buses

Men spend Rs10 for buses to travel for 10 km ride.

Women travel for free.

Source: Own construction

Table II Calculation of load factor

(Load factor=Number of passengers/ Number of seats)

A 100% load factor means the passengers fully occupy the vehicle seats.

>100% load factor means the number of passengers exceeds the number of available seats, often called overcrowded vehicles.

<100% load factor means fewer passengers than available seats.

Source: Own construction

Table III COVID-19 lockdown in India

Status	From (dd/mm/yy)	Till (dd/mm/yy)
Lockdown 1	25.03.2020	16.04.2020
Lockdown 2.0	16.04.2020	03.05.2020
Lockdown 3.0	03.05.2020	31.05.2020
Lockdown 2	20.04.2021	31.05.2021

Source: Giri et al., (2023)

Table IV Calculation of pink pass numbers in chain trips

Passengers onboard the bus	Passengers change the bus	Passengers at the destination	
		Total passengers travelled per day	Total pink passes counted per day
1 million	1 million	1 million	2 million

Source: Own construction

Table V Conversion of units from Indian accounting term to international accounting term

Indian accounting term		International accounting term	
Amount	Term	Amount	Term
100,000	One lac	0.1 million	Half million

10,00,000	Ten lac	1 million	One million
100,00,000	One hundred lac or One crore	10 million or 0.01 billion	Ten million
10,00,00,000	Ten crore	100 million or 0.1 billion	Hundred million or half billion
100,00,00,000	Hundred crore	1000 million or 1 billion	Thousand million One billion

Source: Own construction

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