

WORKING PAPER

Fare-free bus travel scheme for women: Lessons from Delhi

Harshita Jamba, Aravinda Devaraj, Chaitanya Kanuri

CONTENTS

Executive summary	2
Introduction	3
The context of FFPT	4
Study design and methodology	6
Research findings	10
Conclusion	18
Appendix A	19
Appendix B	20
Appendix C	22
Appendix D	23
Appendix E	24
Appendix F	24
Appendix G	25
Appendix H	26
Abbreviations	34
Glossary	35
Endnotes	35
References	36
Acknowledgments	39
About the authors	39
About WRI India	40

Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on emerging issues.

Suggested Citation: Jamba, H., A. Devaraj, and C. Kanuri. 2025. "Fare-free bus travel scheme for women: Lessons from Delhi." Working Paper. New Delhi: WRI India. Available online at: <https://doi.org/10.46830/wriwp.23.00055>

HIGHLIGHTS

- The Delhi government introduced India's first fare-free public transport (FFPT) scheme in 2019, enabling women to travel for free in government buses.
- The aim was to empower women by providing safer public transport.
- Between 2019 and 2023, women's share of total daily ridership increased by 20 percent.
- Budgetary allocations have risen, and other states and localities have adopted similar schemes; however, reactions have been mixed.
- This working paper explores the impact of the FFPT scheme on transport equity, access to opportunities, and travel safety for Delhi's female bus users, analyzing qualitative and quantitative data collected from 2,010 women in June 2023.
- Women, especially those from economically disadvantaged groups, reported significant cost savings. This led to increased bus use for short trips and greater flexibility and autonomy.
- However, the remaining challenges include hostile behavior from male crew members and passengers, noncompliance with seat reservations, and overcrowding.
- Potential remedies include sensitizing crew members, increasing bus services and fleet size, and adopting gendered data analysis for monitoring and evaluation of the scheme.

EXECUTIVE SUMMARY

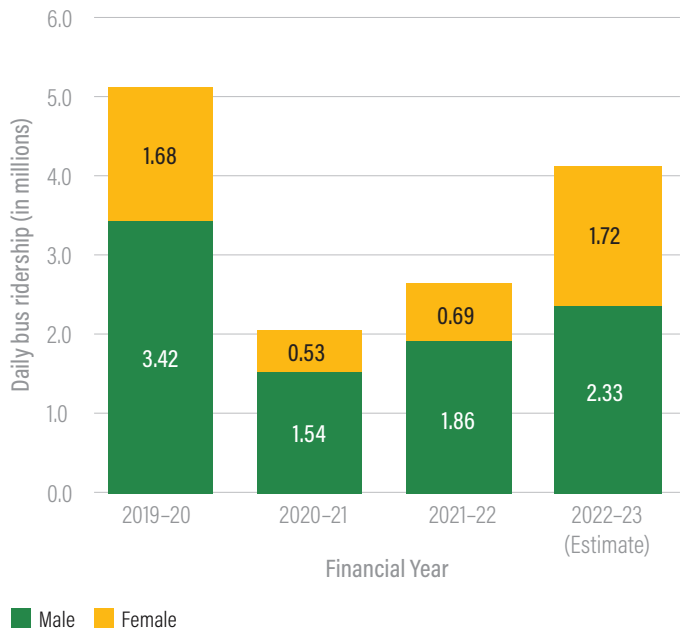
Background

The lack of safe and reliable mobility limits women’s access to education, employment, health care, leisure, and other activities in India’s capital city, Delhi. Studies show that women often forego better educational and employment opportunities far from their homes due to lack of access to a safe and reliable mode of transit (Bansal et al. 2022; Borker 2021; Nikore and Ollivier 2022). Launched in October 2019, Delhi’s free bus travel scheme sought to address this lacuna by providing financial relief to women from low-income households during the COVID-19 pandemic.

The Government of National Capital Territory (NCT) of Delhi implemented the fare-free public transport (FFPT) scheme for women in October 2019, enabling women to travel free of charge on government-owned buses within the city. Its primary objectives were to enhance women’s empowerment and safety in public transport. The FFPT scheme aimed to reduce school and college dropout rates among girls and make travel safer by increasing female ridership (Kejriwal 2019). The budget to fund it has thus far exceeded INR 1.5 billion (approximately US\$17.6 million) (*The Times of India* 2024). Although over 100 cities globally have experimented with FFPT policies for economic, environmental, and social reasons, Delhi’s focus is unique. It aims to address inequities due to the inability to access, or pay for, safe and reliable mobility, which has restricted women’s access to education, employment, health care, and other opportunities (Borker 2021).

Delhi’s FFPT scheme has drawn a mixed response from citizens, experts, and policymakers. Some have welcomed the scheme as a step in the right direction to improve women’s mobility, but some bus users and on-ground transport staff have bristled at it. The backlash has come in the form of discriminatory remarks and exclusionary actions from bus crew members and male co-passengers (Falor 2023). Ridership trends (Figure ES-1) show a steady increase in women’s share of the daily bus ridership from 33 percent in 2019–20 to 42 percent in 2022–23 (Planning Department 2022a). With growing interest in gender-based FFPT policies in other states of India such as Punjab, Tamil Nadu, Karnataka, and Telangana, understanding and quantifying the impacts of Delhi’s FFPT scheme on female bus passengers is important.

Figure ES 1 | Daily bus ridership in Delhi (2019–2023)



Source: Planning Department 2023a.

About this working paper

This working paper presents an in-depth examination of the FFPT scheme’s effects on female bus users in Delhi. It aims to answer the question of how Delhi’s FFPT scheme impacts transport equity, access to opportunities, and travel safety among female bus users.

Our research employs a mixed-methods approach, combining quantitative primary data gathered from over 2,010 women bus users in Delhi with qualitative data gathered from female students, workers, and non-workers exhibiting varying levels of bus usage. In July 2023, we spoke to female bus users about their regular travel patterns and the impact of the FFPT scheme on their mobility and access within the city. Quantitative data were collected from 2,010 female bus users through intercept surveys at 15 bus stops spatially distributed across Delhi. A total of 36 female students, workers, and other women from two low-income housing settlements in the city were interviewed to understand the qualitative aspects and differential impacts of the scheme on different user groups.

Research findings

The findings detail the impacts of the FFPT scheme on women’s mobility patterns and choices, access to opportunities, and experience of safety during bus travel in Delhi.

Delhi’s FFPT scheme primarily benefits women from low-income families, with half the women in our sample saving at least INR 500 per month. Over 90 percent of these women use buses on a weekly basis for work, education, caregiving, and discretionary activities. As many as 95 percent of the women in our sample lack access to a private vehicle and rely on buses due to economic constraints. They reported that the FFPT scheme saved up to 8 percent of their household income per month. The fare waiver has also made women less dependent on male family members, enabling them to travel alone or pay transport costs for other family members.

The FFPT scheme has increased access to jobs, education, and health care, with women traveling farther and more frequently. This has doubled the opportunities available within their travel range, and especially benefited students commuting to institutes of higher learning. Women report a median trip length of 10.52 kilometers (km), which allows them to access nearly a quarter of the city’s opportunities by bus. The scheme also eliminates the “pink tax” on short trips, allowing women to save on commute costs and travel time by shifting from slower or more expensive modes to buses.

Despite the FFPT scheme’s advantages, implementation gaps remain, affecting women’s access to safe and reliable bus services. Inefficient bus schedules, overcrowding, and harassment are common, deterring some women from using buses. Safety concerns, exacerbated by gender biases, prevent many women from utilizing the available grievance mechanisms. Worries over safety due to hostile staff behavior are reported by 59 percent of the women in the sample. Although female ridership has increased from 33 percent to 42 percent since the scheme’s introduction, transit agencies still face revenue shortfalls. However, the FFPT scheme’s cost is a minor portion of the total operational expenses, and it has not significantly impacted overall bus operations.

Recommendations

Further steps are needed to overcome the barriers to women’s bus use that undermine the scheme’s benefits.

Improving service quality is key. This can be achieved by expanding the bus fleet, replacing outdated vehicles, and increasing bus frequency. Bus schedules and routes should take women’s mobility needs into account. Transit agencies also need to sensitize bus staff, such as drivers, conductors, and bus marshals, to women’s mobility issues and the intent of the FFPT scheme.

Collecting and analyzing gender-disaggregated data from sales of regular and pink tickets is vital for understanding gendered mobility patterns. Incorporating spatial and temporal data will help transit agencies monitor demand fluctuations in real time and adapt their services accordingly. These combined efforts can ensure that the FFPT scheme not only increases women’s ridership but also improves their safety and mobility experience in Delhi’s public transport system.

INTRODUCTION

Fare-free public transport (FFPT), also known as “free public transport,” allows passengers to use public transport services, such as buses or trains, within a defined geographical area or during specific periods without paying fares or purchasing tickets.

In 2019, the Delhi government became the first government in the world to introduce free travel for women on all government-owned buses within city limits. As stated in an op-ed by the then Chief Minister of Delhi, the FFPT scheme aimed to enhance women’s safety and empowerment through access to affordable mobility (Kejriwal 2019). Since then, Delhi’s bus agencies have reported a 20 percent increase in women’s share of the overall daily ridership (from 33 percent in 2019–20 to 42 percent in 2022–23) (Planning Department 2022a).

Women in Indian cities rely heavily on public transport. They often lack access to private vehicles, and the high fares discourage them from using comfortable shared options such as the metro rail or auto-rickshaws (Shah et al. 2017). Women incur extra costs and spend additional time waiting for safe and comfortable transport, a systemic issue unique to women’s mobility. The penalty they pay has been called the “pink tax” (Alam et al. 2021). Buses remain the most affordable transport option for women. However, inadequate connectivity, safety, and reliability discourage women from riding buses, especially where these problems are most acute, such as in the city’s outskirts, where no other mode of transport may be available. Transport equity—that is, equitable access to safe, reliable, and affordable transportation, especially public transport—is therefore essential to bridge the gender gap in mobility to strengthen women’s empowerment and participation in society (Lecompte and Juan Pablo 2017).

A safe and reliable commute to access education and jobs is a critical issue for women in India, more so in the national capital of Delhi, where crime is a real concern. The National Crime Records Bureau reported 0.445 million registered cases of crimes against women in 2022, and Delhi ranked highest, with 1,444 registered crimes per million population (Chakrabarty 2023). According to the 2011 Census of India, 25 percent of Delhi’s working women traveled by bus, second

only to the 38 percent who used non-motorized modes (walking and bicycles) to commute. However, women and girls felt unsafe traveling by public transport, and studies conducted in Delhi revealed that 47 percent of women felt unsafe when moving about in the city. Overcrowding and poorly lit bus stops made women vulnerable to harassment and gender-based violence (Praja Foundation and IC Centre for Governance 2019). Fear of unsafe commutes also force many women and girls to fore go better education and employment opportunities in favor of opportunities closer to their homes (Borker 2021; Nikore and Ollivier 2022; Ratho and Jain 2021).

Delhi’s FFPT scheme aimed to improve women’s access to opportunities by eliminating the cost barrier and improving safety by increasing the number of women in public transport.

When the scheme was introduced, in October 2019, women made up an estimated 33 percent of the overall ridership (gender-disaggregated ridership information was not captured before the scheme was launched). This share increased to 42 percent in the initial months but dropped to 26 percent during the COVID-19 lockdown (Table 1). By 2022, a total of INR 4.84 billion had been spent on the FFPT scheme. Despite the significant overlap between the scheme’s implementation period (since October 2019) and the COVID-19 lockdown (March 2020 to February 2022), the FFPT scheme succeeded in increasing the female ridership beyond pre-pandemic levels. In 2023, four years since its introduction, women comprised about 42 percent of the daily bus ridership in the city (Planning Department 2023a). In response to the increasing female ridership in Delhi buses, the Delhi government has been extending the term of the FFPT scheme and increasing its budgetary allocation each year.

Table 1 | Increased daily ridership in Delhi buses (2017-2023)

DETAILS	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Total daily ridership (millions)	4,524	5,102	2,077	2,549	4,055
Women’s daily ridership (millions)	X ^a	1,682	0,533	0,693	1,720
Women’s share of daily ridership (%)	X ^a	33 ^b	26	27	42

Note: X = not available.

a. Women’s ridership data were not collected before the introduction of the FFPT scheme.

b. Women’s ridership data for the financial year 2019–20 were collected from October 2019 onward.

Source: Planning Department 2023a.

Following Delhi’s example, other Indian states such as Punjab, Tamil Nadu, Karnataka, Telangana, and Andhra Pradesh have introduced local versions of the FFPT scheme in their cities. However, the introduction of the gender-based FFPT schemes has produced some unintended consequences. Critics question the economic sustainability of FFPT schemes, which increase the pressure on transit agencies operating within tight financial constraints. Moreover, the increased ridership leads to overcrowded buses. Women from all the states implementing FFPT schemes have faced discriminatory behavior, such as drivers refusing to halt buses at stops with more women passengers, crews and passengers treating women rudely, and flouting of rules reserving seats for women.

Globally, FFPT policies, their implementation strategies, and impacts have been widely documented and analyzed. However, the concept of “gender-based FFPT” is relatively new and unique to India, and has not received as much attention. As political interest in gender-based FFPT schemes in India grows, it is critical to understand the impact of such schemes on the beneficiaries. Our study aims to address this gap through a detailed documentation and analysis of the country’s first gender-based FFPT scheme, in Delhi.

Our working paper seeks to answer the question of how Delhi’s FFPT scheme impacts transport equity, access to opportunities, and travel safety among female bus users.

The next section of the paper describes the context of FFPT schemes in Delhi and other geographies, and the learnings from past studies on Delhi’s FFPT scheme. This is followed by an overview of the mixed-methods research approach adopted for our study, including the data collection process and sample description. The following section discusses in detail the research findings obtained from an analysis of these data. The final section summarizes the broad implications of these findings and offers recommendations to ensure effective implementation of the FFPT policy in Delhi.

THE CONTEXT OF FFPT

The FFPT scheme in Delhi

The Delhi government operates 7,135 buses (ANI 2023), which are owned by the Delhi Transport Corporation (DTC) and managed by the DTC and the Delhi Integrated Multi-modal Transit System (DIMTS). The FFPT scheme enables women to travel free of cost on all the buses, both air-conditioned (AC) and non-air-conditioned (non-AC). It is applicable to all female passengers irrespective of age and domicile status, and is valid within the National Capital Territory (NCT) limits of Delhi. Women are issued a “pink ticket” for every bus ride they take, and the operators are

reimbursed by the Delhi government at the rate of INR 10 for every pink ticket issued. Women are allowed to pay for their rides if they choose to do so.

Delhi's FFPT scheme was proposed, and has been entirely financed, by the Delhi government. In the current financial model, more than 70 percent of the DTC's revenue and 100 percent of DIMTS's revenue comes from the Delhi government in the form of grant-in-aid or viability gap funding (VGF) to cover operational deficits and subsidies for concessional passes (Table 2). In 2022–23, the subsidy the government gave the DTC and DIMTS toward the FFPT scheme (INR 4 billion) amounted to 10.4 percent of the total funding given to cover operational deficits (INR 43 billion).

Table 2 | **Summary of revenue under different heads for DTC and DIMTS (2022–2023)**

SUMMARY OF FINANCIAL POSITION	TO DTC (BILLION INR) ^a	TO DIMTS (BILLION INR) ^a	TOTAL (BILLION INR) ^a
Compensation for operational deficit	23.5 (grant-in-aid)	15.0 (VGF)	38.5
Subsidy for other concessional passes	0.5	0	0.5
Subsidy for pink tickets	2.0	2.0	4.0
Total funding received from the Government of Delhi	26.0	17.0	43.0
Pink ticket subsidy as a share of total subsidy received (%)	8.5	13.3	10.4

Note: DTC = Delhi Transport Corporation. DIMTS = Delhi Integrated Multi-modal Transit System. VGF = viability gap funding.

a. Average conversion rate in 2023: 1 INR = \$0.0121.

Source: WRI India authors, based on the Plan Outlay and Expenditure section of Planning Department (2023b).

The Delhi government and the DTC have undertaken a series of measures over the years to address women's mobility problems. For instance, the DTC has been operating exclusive buses for women on 30 routes since 2012. On all DTC buses, 25 percent of seats are reserved for women. Since 2015, it has been mandatory to install location tracking devices, CCTV cameras, and panic buttons on all public transport vehicles in Delhi (PTI 2015a). The Bus Marshals Scheme, also introduced in 2015, requires security personnel to be present in all city buses to ensure the safety of passengers

(PTI 2015b). In October 2019, alongside the introduction of the FFPT scheme, the number of bus marshals deployed was increased sharply from about 3,000 to 13,000 (Tiwari 2019).

FFPT schemes in other geographies

Indian FFPT schemes differ from their global precedents in their intent, target group, and scale. Globally, cities have been experimenting with the idea of FFPT since the 1960s. In most cities, FFPT schemes have been introduced to address one of three main issues (Fearnley 2013):

- **Environmental concerns:** FFPT schemes in Europe and America largely focus on promoting greener mobility alternatives and improving air quality. For example, public transport is free in Prague, Brussels, and Paris during periods of high smog or air pollution to encourage the residents to shift to public transport (Prague Morning 2019).
- **High private vehicle mode share:** Cities where heavy use of private vehicles causes traffic congestion and stresses road infrastructure have explored FFPT schemes as a way to incentivize a long-term mode shift to public transport (Štraub 2016).
- **Economic pressure on urban residents:** FFPT is also viewed as a tool to tackle the rising cost of living in cities by making urban mobility more affordable. For example, Dunkirk hopes to increase the attractiveness of the urban core and boost the purchasing power of its residents through its free bus travel scheme (Briche and Huré 2018).

Although FFPT schemes elsewhere have targeted all city residents or specific commuter groups such as students, senior citizens, or persons with disabilities, Delhi's FFPT scheme is the first to define its target group by gender.¹ The beneficiaries of Delhi's FFPT scheme (about 0.42 million women and girls) are approximately as numerous as the beneficiaries of schemes in Europe and America that cover the entire population (0.42 million in the city of Tallinn, or 0.614 million in the country of Luxembourg). FFPT schemes in Karnataka and Tamil Nadu cover much larger target groups, making the scale of FFPT operations in India unrivaled.

In the global examples of FFPT schemes that have been widely documented and studied, lowering travel costs for economically vulnerable groups is the most often-cited benefit. Although vulnerable passengers receive economic benefits, these are sustained over the long term only if transit systems provide adequate service (EU Urban Mobility Observatory 2021). In many cities, the new transit trips have replaced trips taken on foot or by bicycle, but usage of private vehicles has decreased only marginally (Volinski 2012).

Gender-based FFPT schemes, being relatively new and unique, have not received as much attention. Although studies and media reports have documented the details and impacts of the various gender-based FFPT schemes in India, they only capture the early effects of these schemes. Delhi, which has implemented the oldest and longest-running version of this scheme, offers an opportunity to go beyond the initial effects of the scheme and achieve a deeper and more nuanced understanding of its impact on women’s mobility.

Studies on Delhi’s FFPT scheme

Early studies sought to quantify the monetary and temporal benefits of Delhi’s FFPT scheme for women. A study by the Planning Department of Delhi in 2020 showed that 58 percent of the 3,450 households surveyed had benefited from the FFPT scheme, saving an average of INR 426 per month on travel expenses (Centre for Market Research and Social Development 2020). Dasgupta and Datta’s review of the National Time Use Survey data for the NCT of Delhi in 2019 revealed an increase in women’s average work participation rate by 24 percent and their time spent on paid work by 2.5 hours after the introduction of the FFPT scheme (Dasgupta and Datta 2023).

On the other hand, some studies capture implementation gaps that limit the benefits of the scheme. A 2021 study on resource-poor women highlighted the emergence of new barriers to their bus use, such as buses not halting for women and lax enforcement of seat reservations for women (Shah et al. 2023). A more recent survey of 500 women in the city by Greenpeace India confirmed that these barriers persist four years after the scheme’s introduction (Farooq and Goyal 2023).

Although these studies document different aspects of Delhi’s FFPT scheme, few have accounted for the heterogeneity in women’s demographic profiles and their travel needs, patterns, and choices. Our research aims to address this gap by analyzing the scheme’s impact on women from diverse economic backgrounds, with a focus on their specific mobility needs and concerns.

STUDY DESIGN AND METHODOLOGY

This paper aims to understand how Delhi’s FFPT scheme impacts transport equity, access to opportunities, and travel safety among female bus users.

The scheme’s impacts on the three focus areas of women’s mobility are investigated through the topics described in Table 3.

Table 3 | **Overview of topics covered to address the research question**

FOCUS AREA	SPECIFIC TOPICS OF INVESTIGATION
Transport equity In this study context, “transport equity” is concerned with equity issues in women’s access to bus services.	Impacts on women’s travel choices, expenses, and mobility patterns, determined by their mobility needs and resource constraints. These are investigated through an analysis of qualitative interviews and quantitative surveys.
Access to opportunities This is measured by the number of jobs, schools, colleges, and health care facilities in Delhi that women can access through the bus network.	Impacts on short- and long-distance travel of women by bus and the number of opportunities accessible from their home locations. This is calculated through a spatial analysis using primary and secondary data.
Travel safety It covers issues around personal safety, road safety, and sexual harassment experienced and perceived by women in bus travel.	Impacts on women’s perception and experience of safety, causes of unsafe conditions, and their response to instances of harassment. These are captured through qualitative interviews and quantitative surveys.

Source: WRI India authors.

Primary data collection

To address the research question, our study analyzes qualitative and quantitative data from primary and secondary sources. Primary data collection was undertaken in July 2023 and included interviews with transport authorities, focus group discussions (FGDs) with women, and intercept surveys of female bus users in Delhi. Secondary data on daily ticketing trends, route details of women-only and regular services, and the budget outlay for the FFPT scheme were sourced from the DTC, DIMTS, and the Delhi Outcome Budgets for 2018–19, 2019–20, 2020–21, 2021–22, and 2023–24 (Planning Department 2019, 2020, 2021, 2022b). Table 4 summarizes the primary data collection process.

Interviews with the transport authorities focused on understanding the implications of the FFPT scheme for the agencies’ daily operations. To capture the scheme’s impacts on women from the Economically Weaker Sections (EWSs),

Table 4 | Summary of the primary data collection process

TARGET GROUP	DATA COLLECTION FORMAT	SAMPLE SIZE	SAMPLING STRATEGY
Heads of departments from the Transport Department (Delhi government) and the Delhi Transport Corporation (DTC)	In-depth interviews	4 interviews	Snowball sampling to interview authorities responsible for the implementation and monitoring of the FFPT scheme
Female bus users and non-users from low-income households	Focus group discussions	36 women from low-income neighborhoods	Purposive sampling from 2 locations in the NCT of Delhi
Female bus users	Intercept surveys	2,010 female bus users	Random sampling from 15 locations around the NCT of Delhi

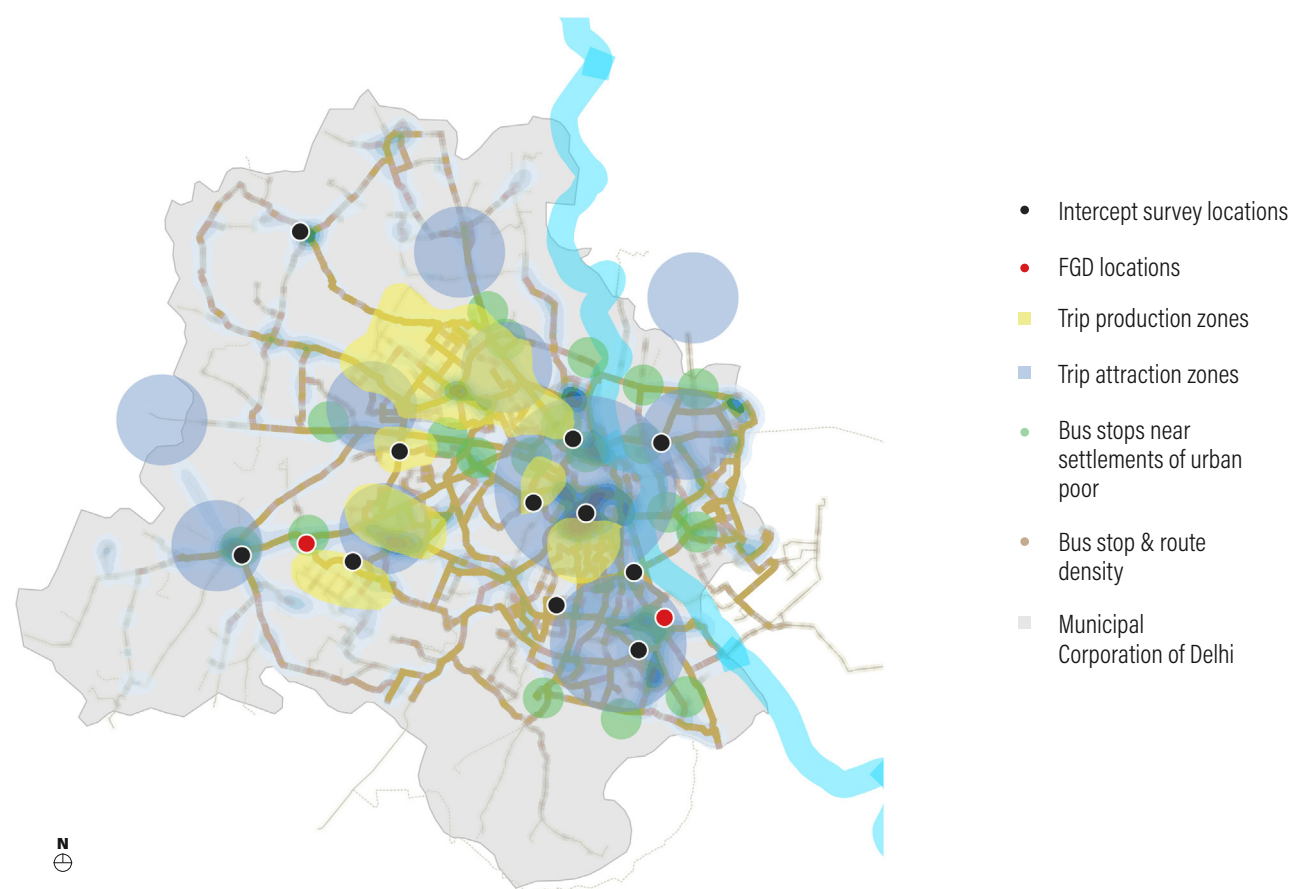
Note: FFPT = fare-free public transport. NCT = National Capital Territory.

Source: WRI India authors.

FGDs were conducted in two low-income neighborhoods in the city: Taimur Nagar in New Friends Colony (closer to the city center, with better bus services) and Kakrola village in Dwarka Sector 15 (closer to the outskirts, with poorer bus services).

Respondents in the FGDs included bus users and non-users and covered three groups of women: students traveling primarily for education, women in paid work, and women not in education or paid work (homemakers, caregivers, retired women, elderly women, and women who did not identify as students or workers). Women traveling outside their homes at least once a month who reported the bus as their most frequent mode of travel were considered bus users. The

Figure 1 | Parameters considered in selecting locations for data collection



Note: FGD = focus group discussion.

Source: Land use from Master Plan for Delhi 2021 (Delhi Development Authority 2021); location of notified slums, JJ colonies (i.e., cluster housing), and so on, from a study by Shah et al. (2023); and bus stop and route density from official DTC data.

discussions captured the perceptions of female bus users and non-users, the breadth of impacts from the FFPT scheme, and challenges in using bus services in the city.

To capture the composition of female bus ridership and the scale of the scheme’s impacts on them, an intercept survey was conducted at 15 bus stands within Delhi NCT limits covering 2,010 respondents. The survey locations included both trip production zones (residential clusters) and trip attraction zones (key destinations such as employment hubs, markets, commercial zones, administrative centers, educational institutions, etc.). The locations were spatially distributed across the city to account for variations in bus service quality levels, and included bus stands close to low-income housing settlements.

The survey respondents—female bus passengers—were selected through random sampling between 7 AM and 9 PM on all days of the week. The survey covered the demographic and travel characteristics of women using the bus and the scheme’s impacts on their finances, mobility patterns, travel choices, and perceptions of the bus services. Figure 1 shows the spatial distribution of the survey locations and the parameters considered for their selection. Appendix A provides a detailed description of the data collection process.

Scope and limitations of the study

- This study aims to analyze the reported impacts of Delhi’s FFPT scheme on its female bus users and does not enter the larger debate on whether public transport should be made free at all.
- This study limits its review of the FFPT scheme to its impacts on the end user: female bus users. Further research investigating the scheme’s impacts on other commuter groups, the public transport agencies, and other players in the mobility ecosystem is required for a comprehensive understanding of its merits and drawbacks.
- Data collection was limited to women aged over 18 and focused primarily on those using the bus services. A limitation of the study is that it does not capture the perspectives of male bus users and of women and men who do not use bus services through the large-scale quantitative survey.
- Although this study captures changes in the respondents’ travel patterns before and after the FFPT scheme’s introduction, it cannot isolate the scheme’s impacts from other external causes such as the COVID-19 lockdown and changes in the respondents’ life stages (education, employment, marriage, etc.).

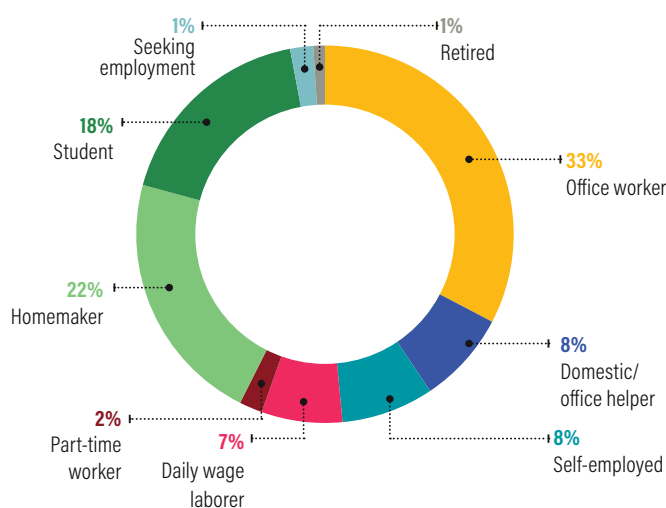
- A complete random sampling of adult female bus users was adopted to achieve unbiased representation across participant characteristics, study locations, days of the week, and times of day. However, unintended biases may remain, stemming from women’s varying willingness and availability to participate in the survey.

Description of the sample

The survey sample covered 2,010 female bus passengers across the NCT of Delhi. Appendix B presents an overview of the demographic characteristics of all the respondents in the sample and their private vehicle ownership and usage. This subsection summarizes the key characteristics of the respondents and their travel characteristics.

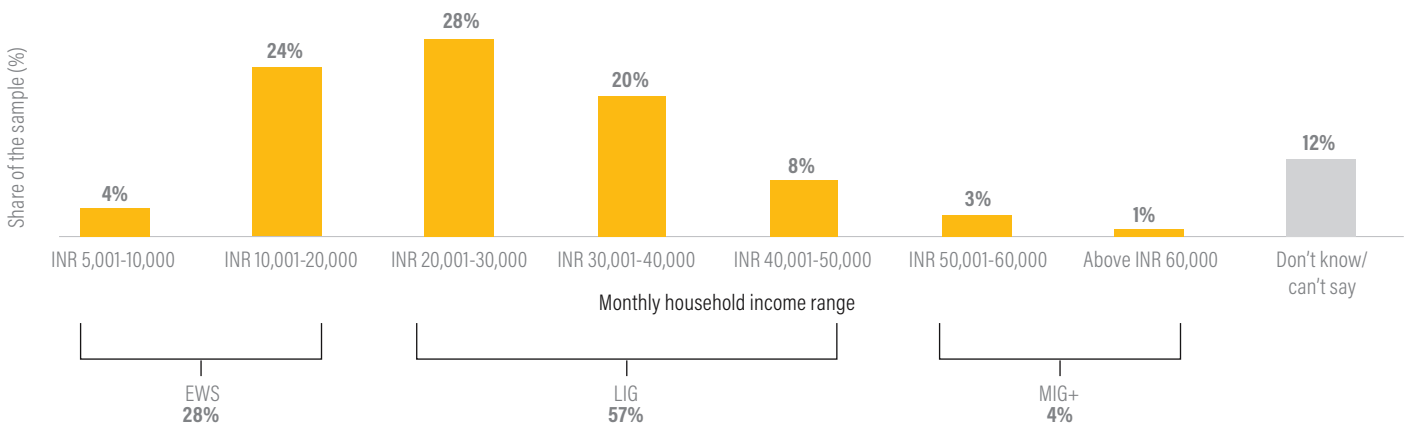
Workers (58 percent), homemakers (25 percent), and college students (18 percent) dominate the sample (Figure 2). Nearly 30 percent of them are from the EWSs of the city, with a household income below INR 20,000 per month (Figure 3). Almost 60 percent of the women in the sample belong to the Scheduled Caste (SC), Scheduled Tribe (ST), or Other Backward Class (OBC). About 31 percent of the women surveyed have migrated from the adjoining states of Uttar Pradesh, Haryana, and Rajasthan, and a comparable 28 percent are from Bihar and other northern and central Indian states.

Figure 2 | **Distribution of the survey sample by vocation and status of work**



Source: WRI India authors, based on primary data.

Figure 3 | Distribution of the sample by average monthly household income



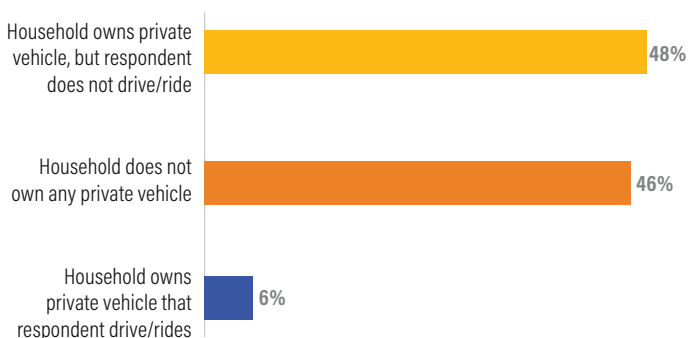
Notes: EWS = Economically Weaker Section (annual income under INR 300,000). LIG = Low Income Group (annual income between INR 300,000 and INR 600,000). MIG = Middle Income Group (annual income above INR 600,000). Income thresholds are defined in accordance with Pradhan Mantri Awas Yojana (Urban) Housing for All Scheme Guidelines (Ministry of Housing and Urban Affairs 2021).

Source: WRI India authors, based on primary data.

Key travel characteristics of the sample

One in two women surveyed do not have a private vehicle to travel. Forty-nine percent of the women surveyed do not have a motorized vehicle at home, and about 46 percent have one but do not use it (Figure 4). Consequently, the women rely heavily on buses for their regular travel, with 91 percent taking the bus on a weekly basis (Figure 5a). Besides workers and college students on their daily (five-day) commutes, homemakers, job seekers, and retired women also take the bus an average of three days per week.

Figure 4 | Distribution of the sample by vehicle ownership and usage



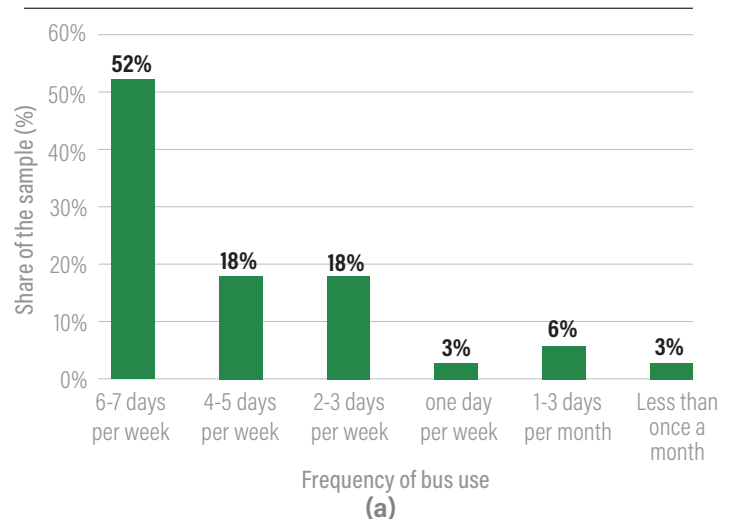
Source: WRI India authors, based on primary data.

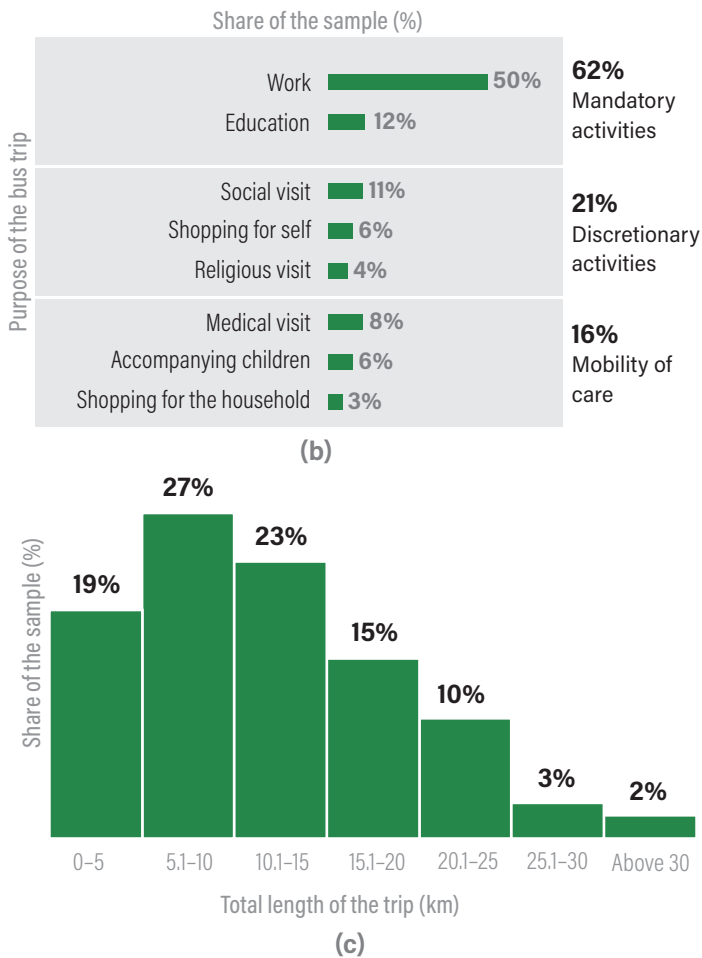
One in seven women use the bus to provide care to another adult or child. Work and education-related travel account for 62 percent of all bus trips recorded in the sample, while 16 percent are made for “mobility of care,” encompassing medical visits, household shopping, and accompanying children. Mobility of care constitutes 47–55 percent of all trips among

homemakers, job seekers, and retired women. These trips are generally undertaken on weekdays during the morning peak (7 AM to 11 AM) and off-peak (11 AM to 6 PM) hours and on weekends from 11 AM onward, making these travel patterns highly variable and time sensitive. Figure 5b shows the distribution of trips taken for various purposes.

One in two women travel under 10 km. About 46 percent of the reported trips were shorter than 10 km, and 85 percent were under 20 km (Figure 5c). This mirrors the distribution of trips across Delhi’s bus users as recorded in the existing literature (Suman et al. 2017). In our sample, the median distance of a bus trip is 10.52 km, and the median travel time inside the bus is 42 minutes. Including the wait and travel times for the first- and last-mile legs, women, on average, spend a little over an hour (62 minutes) in an end-to-end

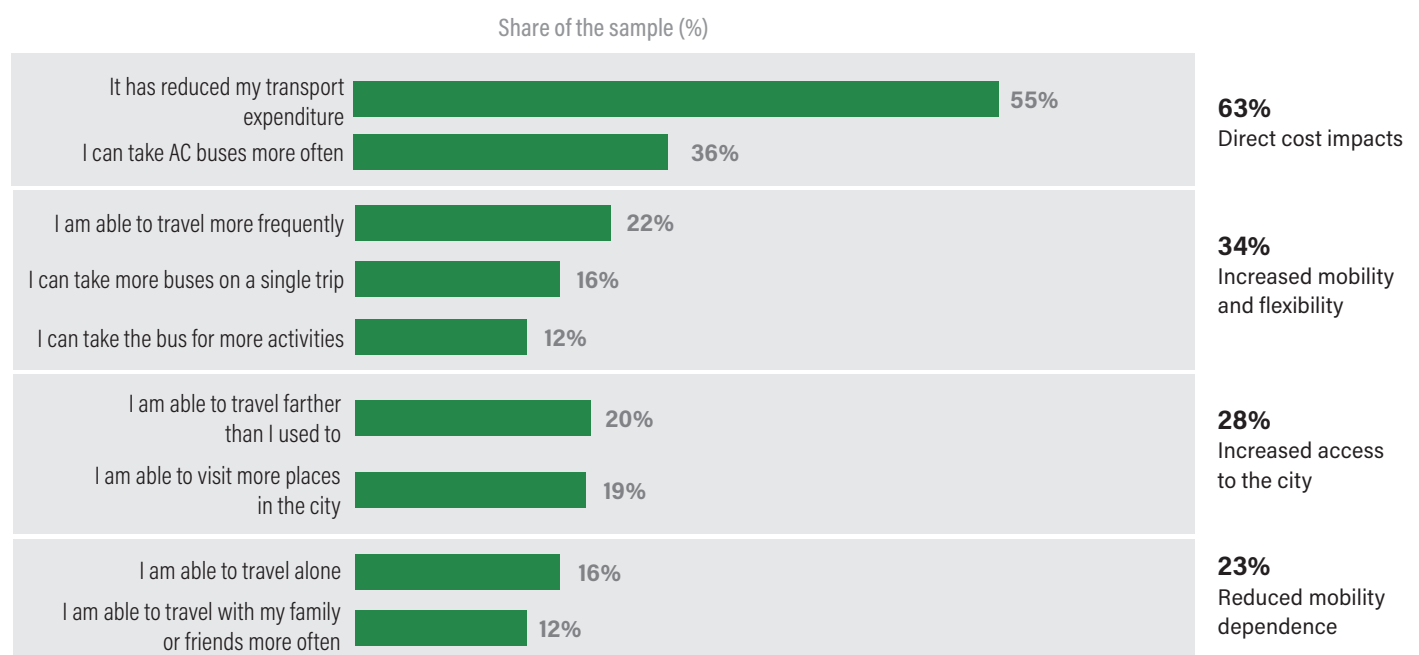
Figure 5 | Distribution of the sample by (a) frequency of bus use, (b) purpose of travel by bus, and (c) distance of bus trips





Source: WRI India authors, based on primary data.

Figure 6 | **Benefits of the FFPT scheme for women**



Note: FFPT = fare-free public transport. N = 1,831 respondents, who reported that the FFPT scheme was important to them.

Source: WRI India authors, based on primary data.

one-way bus journey. About 84 percent of the women take a direct bus to their destination, and the rest change two or three buses per journey.

RESEARCH FINDINGS

Of the women interviewed in the sample, 91 percent said the FFPT scheme was important to them, and 8 percent said the scheme made no difference to them. Figure 6 summarizes the reported benefits from the scheme.

Impact on transport equity

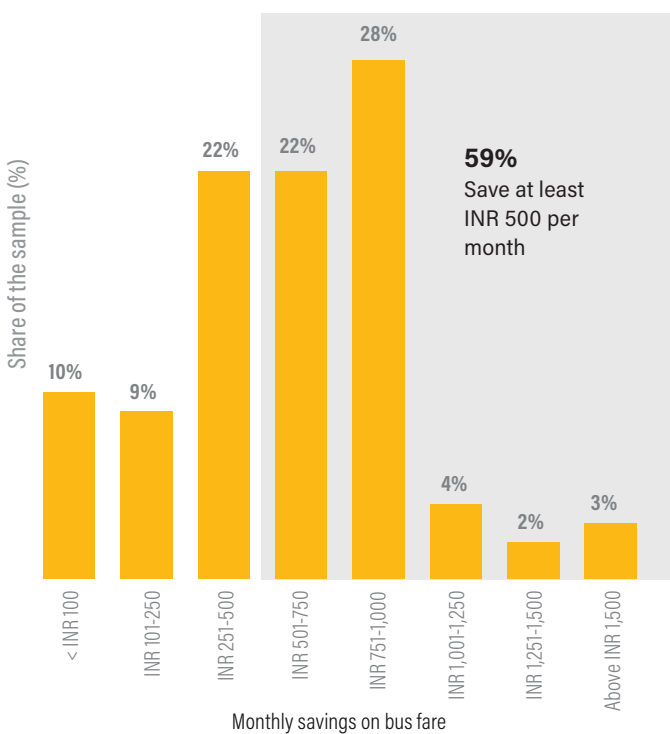
The impact of Delhi's FFPT scheme on transport equity for women is investigated along three dimensions:

- Its impact on women's travel expenditure and transport options
- The different implications of traditional fare structures and the FFPT scheme for women's mobility patterns
- The FFPT scheme's impact on the flexibility and autonomy of women's travel

Impact of the FFPT scheme on women’s travel expenditures and transport options

The primary benefit for women from the FFPT scheme is the money they save. Sixty-three percent of women reported reduced transportation expenditures. The estimated median value of the fare they do not need to pay is INR 15.72 per trip (see Appendix C for the calculation of the estimated fare). Most women (68 percent) either walk to and from the bus stops or are dropped off by family members, incurring no travel costs. Given that 91 percent of women travel by bus at least once a week, these estimated savings translate to an average of nearly INR 600 per month per person. On average, women in the sample use buses about 19 days per month, bringing the average savings on bus tickets to INR 593 per person per month. Figure 7 shows the distribution of the sample by their monthly savings on bus fare.

Figure 7 | Distribution of the sample by monthly savings on bus fare

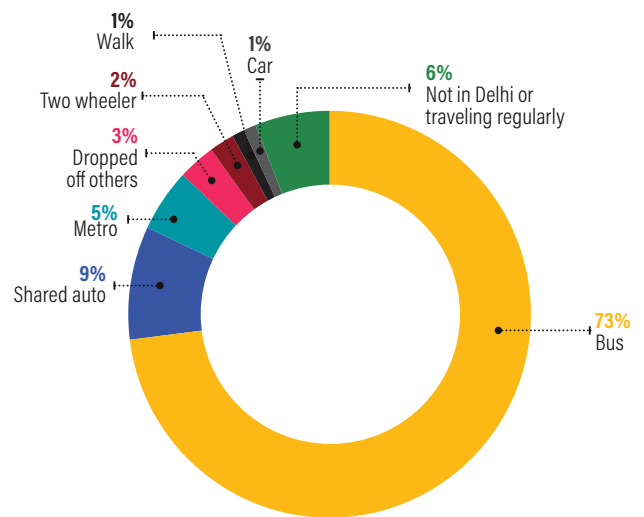


Source: WRI India authors, based on primary data.

The cost savings are particularly noteworthy for women who transitioned from other modes of travel after the FFPT scheme was introduced. Whereas 73 percent of women were previously bus users, 21 percent have shifted from other modes or have started traveling regularly (Figure 8) after the scheme’s introduction. Women who previously used auto-rickshaws now save an average of INR 2,300 per month, whereas those who previously relied on the metro now save INR 1,690 per

month. Sixty-nine percent of the workers in the sample commute to work almost everyday and are able to save over INR 800 per month due to the FFPT scheme.

Figure 8 | Distribution of the sample by mode used before the introduction of the FFPT scheme



Note: FFPT = fare-free public transport.
Source: WRI India authors, based on primary data.

Implications of the traditional fare structure and the FFPT scheme for women’s mobility patterns

Because women often need to complete a chain of tasks in a single journey, their trips are inherently shorter and more fragmented than men’s trips (Ng and Acker 2018). Under a traditional fare structure, women who need to change buses pay more for each kilometer traveled.

The DTC, similar to public transport agencies (PTAs) in most Indian cities, has a telescopic fare structure: the cost per kilometer is higher for shorter distances and lower for longer distances. For instance, a 10 km trip in a non-AC bus incurs a cost of INR 1.5/km (totaling INR 15 for 10 km), whereas a 5 km trip costs INR 2/km (INR 10 for 5 km). In essence, the bus fare structure incentivizes long-distance travel over short trips, penalizing short bus trips and contributing to the “transfer penalty.” For instance, a single trip of 10 km by a non-AC bus would cost INR 15, whereas the same distance covered in two trips (5 km each) costs INR 10 + INR 10 = INR 20. The additional INR 5 due to the transfer is called the transfer penalty. Both these impacts directly affect women’s travel.

Nearly one in five (19 percent) women who travel daily via bus change between two or three buses per trip. Without the FFPT scheme, this transfer penalty would increase their per-trip cost by approximately 55 percent, resulting in an additional expenditure exceeding INR 300 per month.

Eliminating the transfer penalty has also encouraged women to undertake trips with more transfers. To save money, women were previously more inclined to avoid transfers; instead, they waited for the next available direct bus. This added to the total trip time. Considering that the median wait time for buses in the sample is 10 minutes, each bus skipped could lengthen the total travel time of the trip by 13 percent. Since the introduction of the FFPT scheme, 16 percent of the women reported taking more buses per trip to save time (Figure 6).

Differential impacts of the FFPT scheme among different user groups

The impact of the savings enabled by the FFPT scheme on individuals and households varies according to their economic background and circumstances. Before the FFPT scheme was introduced, travel expenditure constituted 8 percent of the monthly household income for women in the city from the EWS group, 4 percent for women from the Low Income Group (LIG), and 2 percent for women from the Middle Income Group (MIG).

Women in formal employment mostly belong to families from the higher-income groups and earn an average of INR 17,600 per month. Their monthly savings on bus fare account for 6 percent of their monthly income. In contrast, women engaged in housekeeping or domestic work belong to the lowest income group and have personal incomes averaging about INR 9,900 per month. The FFPT scheme saves them 13 percent of their monthly income.

One global affordability matrix identifies individuals who spend more than 10 percent of their monthly income on transport as “transport-poor” or “transport-vulnerable” (Alonso-epelde et al. 2023). By this measure, without the FFPT scheme, women engaged in domestic work would be classified as transport poor. The FFPT scheme has enabled them to overcome their transport poverty. Whereas nearly 70 percent of the domestic workers in the sample used the bus as their primary commute mode even before the FFPT scheme was introduced, 10 percent have shifted from shared auto and 8 percent from the metro. These women reported spending an average of INR 1,400 per month on travel before the introduction of the FFPT scheme; now, thanks to the scheme, they save 80 percent of what they had been spending on travel.

The use of and benefits from the FFPT scheme vary across age groups, as revealed in the FGDs. Students realize the greatest cost savings. They spend this money on food and

college supplies, or save it. Some students can afford more comfortable first- and last-mile modes (e.g., choosing shared autos over walking).² Homemakers and retired women, who travel less, do not report significant savings. Working women who ride buses often say that what they save on fares is inadequate to keep pace with the rising cost of living in the city. However, all user groups acknowledge that the FFPT scheme has had nonmonetary impacts as well, such as improved access to opportunities and an enhanced quality of life.

Impact of the FFPT scheme on the flexibility and autonomy of women’s travel

Foremost among these nonmonetary benefits are increased mobility and flexibility of travel. This includes both quantifiable aspects such as travel frequency and trip lengths, and intangible aspects such as greater autonomy and choice in travel decisions. The respondents were asked to compare current (in 2023) and past (before 2019) travel patterns. Nearly a fifth of the sample reported using the bus more frequently due to the FFPT scheme. Their reported increase in bus travel averaged 15 more days per month.

Eliminating fares has also enabled women to opt for AC buses more frequently (see Appendix E for a comparison of fares on AC and non-AC routes). Without the FFPT scheme, women would have to pay higher fares for AC services or wait longer for more economical alternatives. Including the AC routes in the scheme’s coverage has eliminated this cost differential, enabling 32 percent of the women in the sample to take AC buses more frequently for faster and more comfortable travel.

Women’s mobility has long been constrained by societal norms, emphasizing their dependence on male family members for travel. Most of the women participating in the FGD reported that they used to rely on male family members for long-distance travel due to security concerns and limited knowledge of the city. Household budget constraints also often prevented them from traveling independently or with family members for nonessential activities. However, abolishing fares has transformed this dynamic. Women reported a steep drop in their dependence on men to cover their transportation expenses or accompany them on trips. The FFPT scheme has notably enabled women to travel alone more often, as reported by 14 percent of women in the survey sample. Additionally, 11 percent of the women say they are traveling more often with family or friends.

The FGDs revealed that for older women, the ability to travel across the city without financial constraints offers newfound independence. An elderly participant remarked that traveling without having to carry wallets was liberating. Women can now return home by themselves, or undertake essential trips at

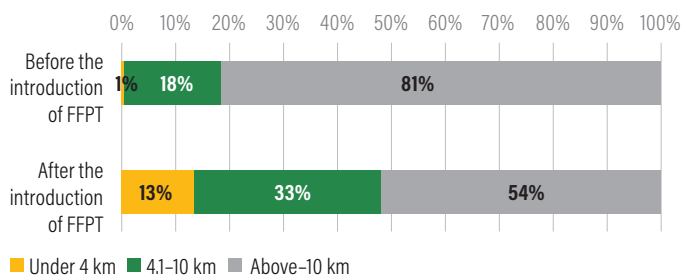
short notice, without waiting for financial or physical assistance from family members. This increased autonomy has had tangible positive outcomes for women of all ages, including mothers who can accompany their children to school and take them on recreational outings more often.

Impact on access to opportunities in the city

Women are taking the bus more frequently and for a wider range of reasons than before the scheme was implemented, and have greater access to locations both close to and far away from their homes. This increased accessibility has opened up more employment, education, and health-care opportunities for women and exposed them to new aspects of urban life.

Ending penalties for short trips has also been consequential. Telescopic fare structures incentivized choosing faster, more flexible modes such as the auto-rickshaw, shared auto, or private vehicles for short trips. Instead of buses, approximately 36 percent of the sample had opted for shared autos, and 40 percent relied on two-wheelers or family members for their short-distance trips. However, women who lacked access to private modes and could not afford the more expensive shared alternatives needed to walk to near by destinations. The FFPT scheme has eliminated this constraint. The share of women making shorter trips (under 4 km) by bus has increased by 12 percent and of those traveling 4–10 km has increased by 15 percent (Figure 9). Eliminating the transfer penalty saves women time and money.

Figure 9 | **Distribution of trip lengths by bus before and after the introduction of the FFPT scheme**



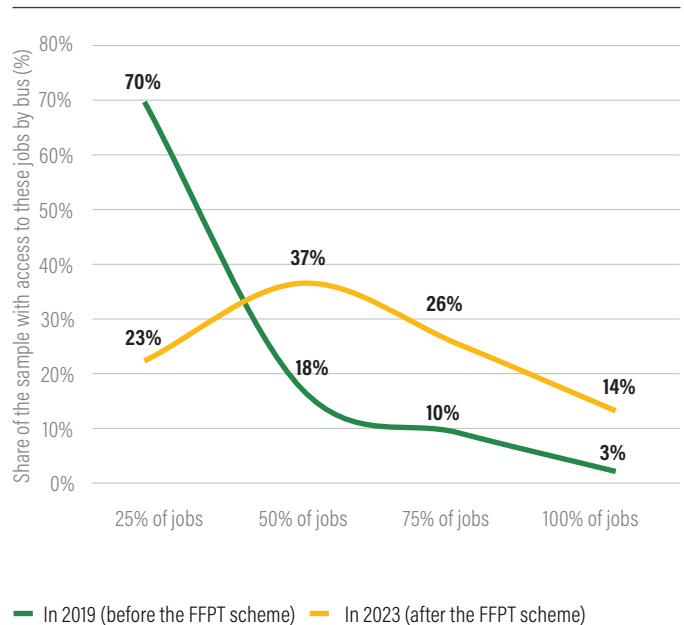
Note: FFPT = fare-free public transport.

Source: WRI India authors, based on primary data.

We used a spatial analysis of trip patterns to gauge the impact of the FFPT scheme on women’s trip lengths and access to opportunities within the city (see Appendix F for a description of the methodology used for the analysis).

Since the introduction of the FFPT scheme, 20 percent of the women in the sample have extended their travel distances. For some, this effectively doubles the number of opportunities they can access, enabling them to visit a greater variety of places for various reasons. Prior to the introduction of the FFPT scheme, these women reported covering an average trip distance of 7.92 km by bus. Only about 18 percent of the city’s formal job opportunities were accessible to them within this distance. After the introduction of the scheme, their average travel distance has increased to 10.52 km, allowing them to access 33 percent of the city’s formal job opportunities. Figure 10 compares the proportion of the city’s jobs accessible to women by bus based on their reported trip lengths before and after the introduction of the FFPT scheme.

Figure 10 | **Share of the city’s formal jobs accessible by bus for trip lengths reported before and after the introduction of the FFPT scheme**

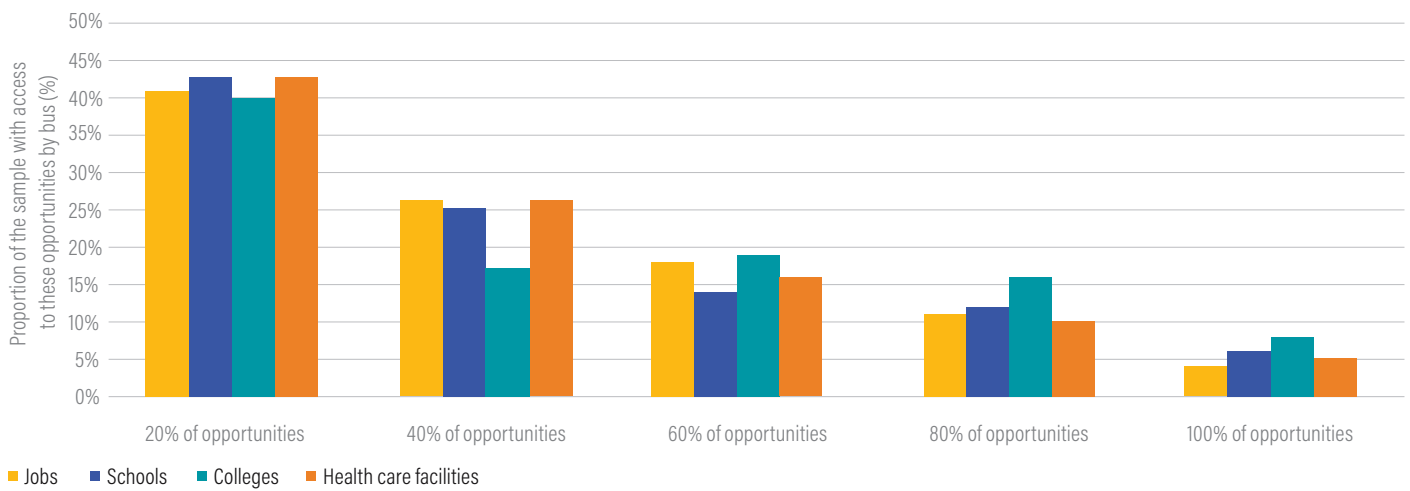


Note: FFPT = fare-free public transport. Estimates are for trip distances under 25 km (95 percent of the sample); longer trips are excluded as outliers

Source: Spatial analysis by the authors using data from All India Directory of Establishments (based on the Sixth Economic Census 2013–14).

Women also report exploring new or remote areas in the city that were previously inaccessible due to the high cost of travel. The length of a typical bus journey for majority of the women in the sample (95 percent) is under 25 km. Nearly a quarter of the city’s opportunities (jobs, schools, colleges, and health care facilities) can be accessed by a passenger covering this distance by bus (Figure 11).

Figure 11 | Share of the city's resources accessible by bus



Note: Estimates are for trip distances under 25 km (95 percent of the sample); longer trips are excluded as outliers

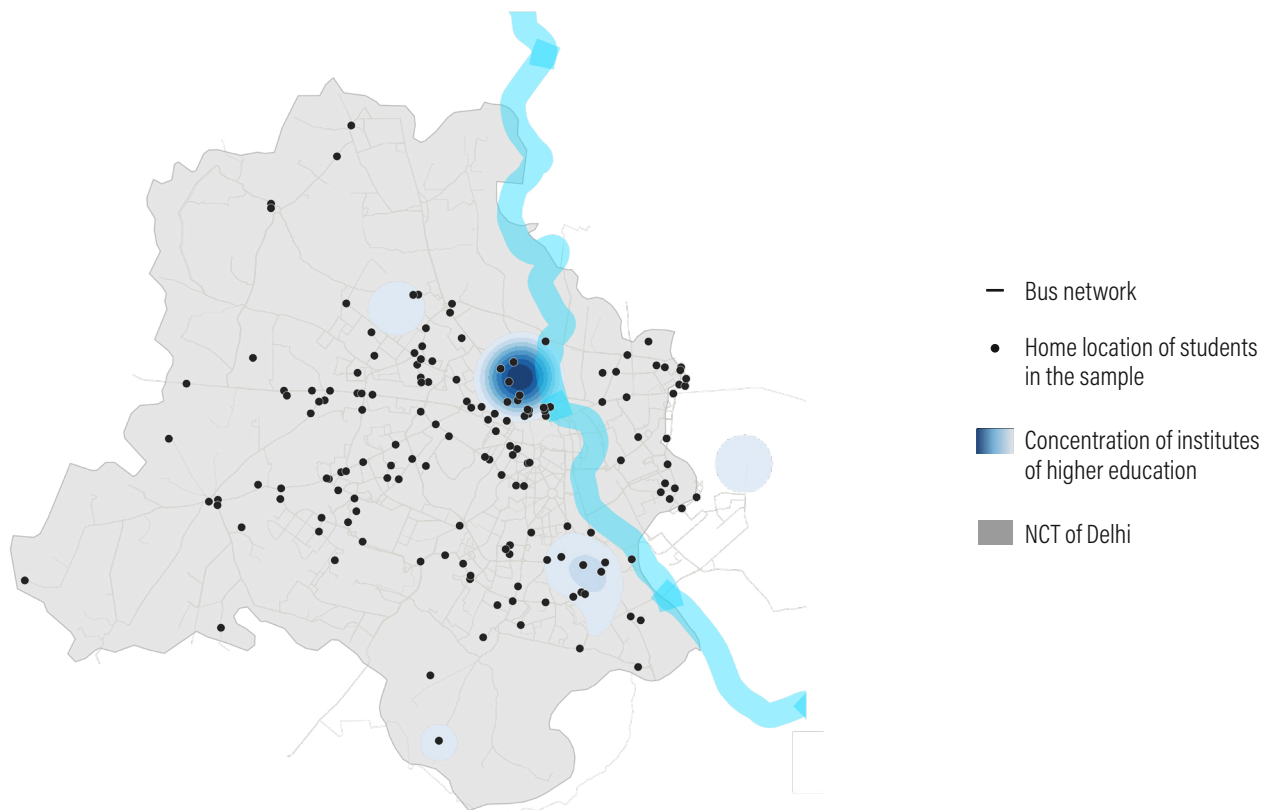
Source: Spatial analysis by authors using data from All India Directory of Establishments (based on the Sixth Economic Census 2013–14) for employment locations, and data from Google Places (2023) and OpenStreetMap (2023) for educational institutions and health care facilities.

Students' access to educational institutions

The FFPT scheme in Delhi has eased the financial burden on college students, particularly those traveling to institutes of higher education in the city. Before the introduction of the

scheme, these students reported spending an average of INR 23 for their daily trips to school or college. After the introduction of the scheme, the estimated monthly savings add up to INR 875 per student. The elimination of transport expenses

Figure 12 | Distribution of the home location of students in the sample versus institutes of higher education in Delhi



Note: NCT = National Capital Territory.

Source: OpenStreetMap Contributors (2023) for spatial distribution of colleges and universities in Delhi, primary data for home location of students in the sample.

not only enables students to undertake longer journeys to pursue their education but also ensures that financial constraints do not hinder their access to quality education in Delhi.

Institutes of higher education in Delhi are concentrated in three or four localities in the city. Students travel to these centers from all parts of the city. Figure 12 compares the spatial concentration of Delhi’s colleges and university campuses and the distribution of the home locations of the college students in the sample. Some girls have forgone educational opportunities because of the expense and time it takes to commute long distances, and concerns about their safety (Borker 2021). Without the FFPT scheme, more students living far from these institutions might give up the chance to broaden their horizons and better their lives.

Impact on travel safety

UNINTENDED CONSEQUENCES

Making public transport safer for women is one of the two stated objectives of Delhi’s FFPT scheme. Although some aspects of the scheme have improved women’s safety, gaps in its implementation have inadvertently posed new challenges. They create an atmosphere of unease for women passengers and increase travel time and costs, undermining some of the FFPT scheme’s benefits (Figure 13).

One of the benefits of the FFPT scheme has been the presence of more female passengers on buses, which alone makes women traveling alone feel safer. One reason for this is that

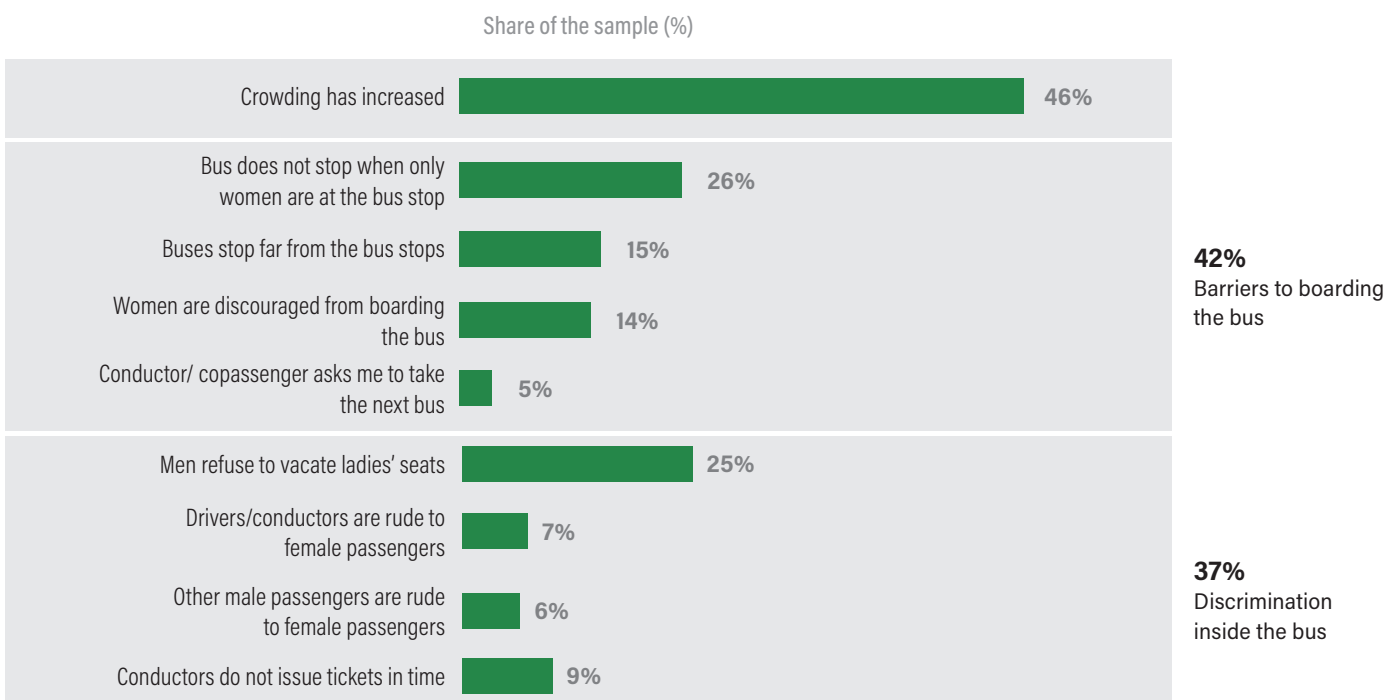
women fear being harassed. In our sample, 10 percent of the women said they would seek help from co-passengers if they encountered harassment on buses. In contrast, only about 3 percent would prefer to raise an alarm through the panic button, helpline, mobile app, or social media.

On the other hand, women passengers find that overcrowding in buses impacts their safety, comfort, and overall commuting experience. Nearly half of the women in the sample (46 percent) point to an “increase in crowding levels” as the top negative consequence of the FFPT scheme, and 64 percent of women feel threatened by the overcrowding. They specifically cite the presence of men congregating near bus doors as a cause of unease. Crowding forces increased interactions with male passengers, who not only congregate at bus doors, act in an unruly fashion, occupy women’s seats, and make women feel uncomfortable (see further details below).

Discrimination and safety

Personal safety concerns, impacting 59 percent of women, stem largely from the behavior of the bus crew. More than half the women interviewed (54 percent) reported enduring snide remarks and/or discriminatory attitudes, from both the bus crew and fellow male passengers. These remarks, often centered around the use of pink tickets, characterize women as taking advantage of the system rather than legitimately utilizing the services designed for them. These attitudes perpetuate gender bias and create a hostile environment, instilling fear and hesitancy, and discouraging women from utilizing public

Figure 13 | Barriers to women’s participation in the FFPT scheme



Note: FFPT = fare-free public transport. N = 2,010 (all respondents in the sample).

Source: WRI India authors, based on primary data.

buses. This also causes women to distrust bus staff and doubt their readiness to provide assistance if they would need it. Although 82 percent of the women acknowledged the presence of bus marshals on their usual routes, only 23 percent said that they would approach the marshals or other bus crew for help. As a result, half the women (49 percent) who experience unsafe incidents or harassment end up taking action on their own, and one-third (33 percent) do nothing or shift to another mode of transport to avoid aggravating the situation.

Approximately 20 percent of the respondents note that drivers often stop buses far from the designated stops, particularly during peak hours, amid heavy traffic, or in isolated areas with few women around. This forces passengers to run considerable distances to board them, posing significant road safety risks. Additionally, 16 percent felt unsafe inside buses due to drivers' fast and reckless driving. In addition to anxieties associated with waiting for a bus, 75 percent of the women report not being able to find a seat during bus travel.

During the FGDs, many women suggested that bus drivers perceive women as non-paying passengers and therefore exhibit discriminatory behavior such as skipping stops where women are waiting. This compels women, who often lack access to a personal vehicle, to wait for the next bus, significantly lengthening their daily commute. Forty-two percent

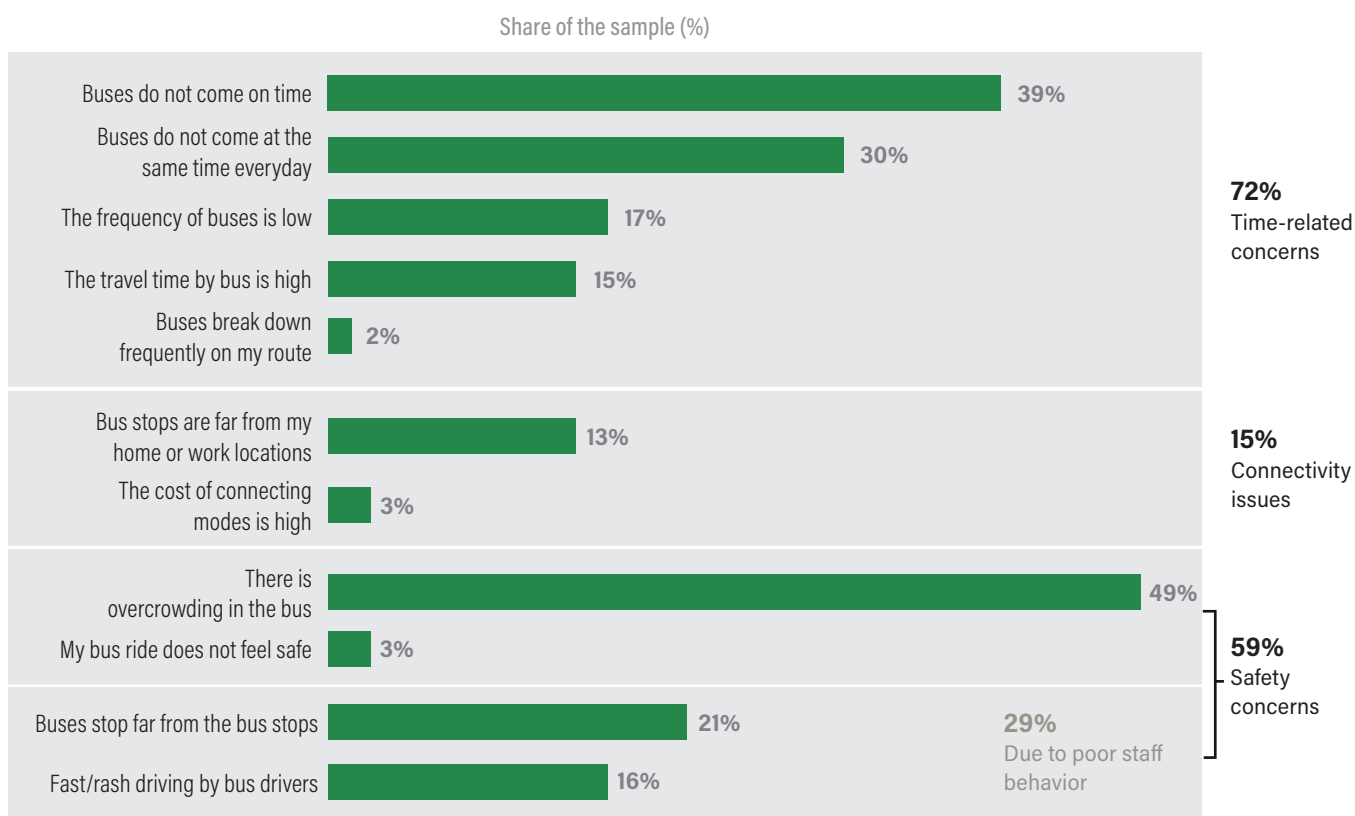
of the women in the sample report facing various forms of discrimination such as bus drivers refusing to stop for them or stopping far from the bus stop, or being asked to take the next bus. This issue particularly affects workers and college students, who are among the most frequent bus users.

Gaps in implementation

Limitations in the quality of bus services

Several obstacles hinder women from fully benefiting from the FFPT scheme (Figure 14), chief among which is the unreliability of bus services. Seventy-two percent of women experience significant travel disruptions due to unreliable bus services. Despite the supposed average wait time of 10 minutes, buses frequently deviate from their schedules and fail to maintain consistent arrival times, leading to prolonged waiting periods. Factors such as inadequate bus frequency, breakdowns of aging buses, and buses skipping stops on overcrowded routes exacerbate these delays. The resulting increase in wait times for buses has a disproportionate impact on women because it increases their exposure to potentially unsafe situations.

Figure 14 | Barriers to bus usage by women due to poor levels of service



Note: N = 2,010 (all respondents in the sample).

Source: WRI India authors, based on primary data.

Although bus stops are within 500 m (walking distance) of the homes of approximately 80 percent of the women in the sample, the remaining 20–24 percent need to travel much greater distances, ranging from 3.5 to 5.5 km. These women rely on e-rickshaws or shared autos to bridge the gap, incurring additional expenses of INR 10–20 per trip. For women living along the city’s periphery, low-frequency bus services and distant bus stops are fundamental barriers preventing them from taking the bus. These factors blunt the impact of the FFPT scheme on the women most dependent on public transport for their travel needs. Consequently, only a few women in the sample from these areas were able to meaningfully increase the frequency or length of their bus trips, or their access to opportunities. Therefore, the spatial distribution of the bus network, including the bus stop locations and route densities, is a critical determinant of the FFPT scheme’s impact on women.

Overcrowding, safety, and in adequate protection

Overcrowding is one of the most serious issues women face while traveling by bus. Over and above the increased physical strain and risk of injury, overcrowding exposes women to the threat of physical harassment from men. Instances of theft and groping remain unchecked and occur more frequently in crowded spaces. To tackle such issues, the deployment of “women-only” bus services is a common solution proposed by authorities and often welcomed by female users. Most suburban rail and metro services in countries such as India, Japan, Indonesia, Brazil, and Egypt have ladies’ special coaches to ensure safe travel for women. Although women-only services have been criticized for propagating exclusionary practices and throwing up practical challenges for women traveling together with males (Graham-Harrison 2015), they are often adopted temporarily to provide an immediate solution to the above-mentioned problems (Nawaz 2018).

FGDs in our study revealed that even women from low-income households are willing to pay the full ticket price for women-only buses if they are compatible with their schedule and staffed with female drivers and conductors. They opine that an all-women crew would eliminate issues such as stop skipping and gender discrimination, and that the presence of other female passengers would enhance safety.

In 2012, the DTC began operating Ladies Special Services, Delhi’s women-only buses, on 30 routes in the city (Swarajya Staff 2018). However, very few women in the sample are aware of these services, and fewer still report ever using them, because the services are limited and hard to access. Ladies special buses are operated only by the DTC, which controls only half of Delhi’s bus fleet. All ladies special buses are deployed on the most popular corridors of the bus network,

which carry 74 percent of the total daily ridership. However, just 10 percent of routes in these corridors operate ladies special vehicles; the remaining 90 percent operate only regular (gender-agnostic) services (see Appendix G for a comparison of routes by female bus ridership and Ladies Special Services). Therefore, only a small sliver of the women who rely on buses can use ladies special buses.

The schedule of Ladies Special Services is restricted to two narrow time windows in the day: 7:30 AM to 9 AM during the morning peak and 4:30 PM to 6:30 PM during the evening peak. Our study shows that workers in informal jobs and homemakers travel during off-peak hours. They would benefit from special services deployed on short-distance routes or from shuttle services connecting residential clusters to the closest economic and commercial hubs. Finally, the ladies special bus routes are concentrated within a radius of 15–20 km around the center of the city, and few extend to the residential and employment clusters beyond (Appendix G). Consequently, none of the special routes connect the peripheral areas to the city center.

CONCLUSION

Gender-based FFPT schemes have proved politically popular in a growing number of Indian states. This public attention offers an opportunity to engage with a broad range of stakeholders and reevaluate urban transport policies, developing FFPT as a component of the larger and systemic changes needed. Providing safer, more convenient commuting experiences for women is an essential part of making urban mobility systems more inclusive, and there is still much to be done.

To better inform existing and future FFPT schemes and policies, policymakers and other stakeholders need to better understand the nature, scale, impacts, and challenges faced by the programs already in place, including the one pioneered by Delhi.

Delhi’s FFPT scheme aims to enhance women’s empowerment and safety in public transport systems. Its potential and long-term impacts on women’s participation in education, employment, and social activities are yet to be seen. However, it shows promise in addressing barriers to women’s mobility, increasing their autonomy and expanding their access to opportunities.

Female bus ridership is up. DTC and DIMTS data from May of 2023 indicate that over 21 million pink tickets were issued daily. We estimate that that this number has risen to over a half million, and that women traveling on buses in Delhi are now saving a total of INR 19.6 million every day. (see Appendix D for the methodology used for this estimation).

The scale and significance of these monetary benefits vary, depending on women's financial situations and travel patterns. The knock-on effects may be equally, or even more, important to many women. For instance, eliminating transfer penalties now enables women needing to take multiple short trips to do so by bus. The FFPT scheme has also brought other important, tangible, nonmonetary benefits to women. For many, free bus travel has meant greater mobility, along with increased opportunity, independence, flexibility, and comfort. At the same time, unintended repercussions, inadequate service, and gaps in implementation have thwarted the scheme's potential to enhance the quality of women's travel and their access to opportunities.

Improvements to the implementation of the FFPT scheme in Delhi

Our research reveals three key steps to improve the uptake and effectiveness of the FFPT scheme in Delhi.

Improve the overall quality of bus services. Fare abolition alone does not guarantee increased ridership. Limitations in bus network coverage, frequency, reliability, and quality of infrastructure must also be addressed. Poor service quality can lead to a reverse mode shift, away from buses, over time. Free public transport can lead to overcrowding and strain poor infrastructure, prompting some experts to advise against implementing free public transport for all in major cities (National Transport Authority 2022). The importance of focusing on service levels is illustrated by Tallinn's example: public transit ridership in Tallinn grew by a mere 10 percent following the introduction of the FFPT scheme but surged 70 percent when the transit routes were reorganized and the service frequency was increased (Mieleszko 2024).

The Level of Service (LoS) of transit systems is particularly important for gender-based FFPT policies because it affects multiple aspects of women's travel. Issues such as low service frequency and extreme crowding inconvenience everyone, but are more serious and harmful for women because of the safety risks they pose. This is especially true for captive users from resource-poor households, who have few alternatives to buses.

According to the benchmarks established by India's Ministry of Housing and Urban Affairs, Delhi has only about a third as many buses as it should. The ministry recommends that cities have 60 buses per 0.1 million population (Ministry of Urban Development 2017). Considering Delhi's estimated population of 32.9 million in 2023 (United Nations Publications 2019), the city would ideally need a fleet of 19,740 buses to meet the prescribed standards but currently operates only 7,135 buses (ANI 2023). This highlights a substantial gap in the city's public transportation system. Addressing this deficit

is crucial to enhancing the accessibility and efficiency of public transport services in Delhi, ensuring that the city's growing population can commute conveniently and sustainably.

Sensitize staff members. Over the past decade, the Delhi government and the DTC have worked toward addressing gender discrimination and mistreatment of women, focusing especially on women's representation in the workforce and sensitization of the male bus crew. However, the backlash against women's free travel from the male bus crew reveals a persisting gap in their understanding and acceptance of the scheme, its intent, and financial implications for their agencies and their operations.

Harassment of women and the indifference of the bus crew to women's needs undermines other initiatives such as seat reservation and deploying bus marshals to ensure their safety. Staff support is especially critical to help vulnerable groups such as the elderly, illiterate, and migrants from other regions navigate the city. Experimental evidence from Hyderabad shows that the presence of uniformed personnel in crime hotspots substantially reduces the instances of harassment faced by women (Amaral et al. 2023). However, on buses in Delhi, this kind of protection is often lacking. Therefore, sensitizing the bus crew members to women's mobility issues and details of the FFPT scheme should form an integral component of the FFPT scheme's implementation strategies.

Collect gender-disaggregated mobility data for monitoring and evaluation. Periodic monitoring and evaluation of the gender-based FFPT scheme is essential to assess its impact on the intended beneficiaries and on the transport ecosystem at large. It will also provide timely insights into the unintended consequences of the scheme. This requires better collection and analysis of gender-disaggregated mobility and ridership data.

Between the DTC and DIMTS, 95.6 percent of the pink tickets issued are paper tickets and 4.4 percent are purchased through the One Delhi mobile application (Planning Department 2022b). Whereas the mobile app captures the origin-destination and time of travel for each ticket, the ubiquitous paper-based tickets record neither detail. Even on the DIMTS-run cluster buses, two-thirds of which use electronic ticketing machines (ETMs) capable of recording location and time stamps, pink tickets alone are issued in paper form. This points to an opportunity to integrate spatiotemporal information into the ticketing system to help build a more comprehensive picture of women's mobility patterns across the city, which can then inform gender-responsive policies and implementation strategies for bus operators.

APPENDIX A. DATA COLLECTION STRATEGY

Primary data on female bus ridership were collected in June 2023 through two approaches, as detailed below.

Qualitative data collection: Focus group discussions

Focus group discussions (FGDs) to collect qualitative data were conducted among women from socially and economically disadvantaged households because they are more dependent on affordable public transport modes. To account for spatial variations in the Level of Service (LoS) of the bus network and their impact on the residents' access to the bus services, two neighborhoods from different parts of the city were selected: Taimur Nagar in New Friends Colony (about 8.5 km from Connaught Place, the city center, with a better bus LoS) and Kakrola village from Dwarka Sector 15 (about 18.5 km from Connaught Place, with a poorer bus LoS). FGDs collected qualitative information on women's use of bus services, the impact of the fare-free public travel (FFPT) scheme on their travel patterns, and the barriers preventing them from accessing the scheme's benefits. In each location, three sets of FGDs were conducted:

- Group 1: Students who travel primarily for education (including students traveling to colleges or vocational training programs outside their homes and part-time workers whose primary purpose of travel is education).
- Group 2: Women in paid work with individual income who travel primarily for work (including part- and full-time workers, women looking for work, and women in home-based jobs who travel outside home for work-related activities).
- Group 3: Women not engaged in paid work who travel primarily for any other purposes (including homemakers, caregivers, retired women, elderly women, and other women who did not identify as students or have an individual income).

Each group consisted of six participants, including three bus users and three non-bus users. Women who traveled at least once a month and whose most frequent mode of travel was the bus were considered bus users.

Quantitative data collection: Intercept survey

Quantitative data were collected from 2,010 female bus passengers through intercept surveys at 15 bus stands spatially distributed across the National Capital Territory (NCT) of Delhi. Respondents were selected through random sampling between 7 AM and 9 PM on all days of the week. Bus stops that satisfied the following three criteria were shortlisted for conducting the surveys:

- Trip attraction and trip production zones: Using land use data from OpenStreetMap Contributors (2023) and points-of-interest data from HERE Places 2021 (<https://www.here.com/docs>) for the Municipal Corporation of Delhi, spatial clusters were identified for each of the following categories: residential, industrial and commercial zones, amenities (banks and government offices), educational institutions (schools and colleges), and health care centers (hospitals and clinics). This enabled areas to be matched to the frequent travel purposes of women. Areas with overlapping clusters were identified as trip attraction zones, and residential zones were identified as trip production zones.
- LoS of the bus network: Official spatial data on the routes and stops of Delhi Transport Corporation (DTC) and cluster buses (Delhi Integrated Multi-modal Transit System [DIMTS]) were used to determine the LoS. Areas with multiple overlapping bus routes and a high density of bus stops were identified as well-served localities, whereas areas with fewer bus routes and bus stops were identified as poorly served localities.
- Housing clusters of low-income families: The locations of urban villages, resettlement colonies, JJ bastis (slums), SEWA Shakti Kendras (resource centers of the Self-Employed Women's Association), and settlements of home-based workers in Delhi were spatially mapped. Bus stops near overlapping clusters of these settlements were identified as the trip production zones of the economically weaker groups. Data for this were referenced from a 2020 study on the use of public transport by resource-poor women after the COVID-19 pandemic and the introduction of the fare-free public travel (FFPT) scheme (Shah et al. 2023).

Quantitative data collected on female bus users covered the following:

- Sociodemographic profile.
- Travel patterns and typical trip characteristics in 2019 and 2023.
- Perceptions of safety and convenience in bus travel.
- Opinions regarding the FFPT scheme and its implementation (relevance of the FFPT scheme to their travel needs, response to potential discontinuation of the scheme, etc.).
- Details of the scheme's impacts on their travel patterns (e.g., purpose, distance, and frequency of travel; cost of travel and alternative mode choices; and their experience of safety and convenience in buses after the introduction of the FFPT scheme).
- Barriers to accessing the scheme's benefits and to using buses.

APPENDIX B. DESCRIPTIVE SUMMARY OF THE SURVEY SAMPLE

Table B1 | Description of the sample

DEMOGRAPHIC CHARACTERISTIC	NUMBER OF RESPONDENTS	SHARE OF THE SAMPLE (%)
AGE GROUP (N = 2,010)		
18–25 years	663	33
26–40 years	828	41
41–50 years	323	16
51–60 years	140	7
Above 60 years	56	3
EDUCATIONAL ATTAINMENT (N = 2,010)		
Did not go to school	307	15
School (Class 8 or lower)	317	16
School (Class 9–12)	591	29
Graduate college (diploma or degree)	631	31
Postgraduation or higher	164	8
SOCIAL GROUP IDENTIFIED WITH (N = 2,010)		
General	762	38
Other Backward Class (OBC)	645	32
Scheduled Caste/Scheduled Tribe	553	28
Do not know/prefer not to say	50	2
MIGRATION - NATIVE STATE (N = 2,010)		
National Capital Territory (NCT) of Delhi	707	35
Uttar Pradesh	486	24
Other states adjoining Delhi (Haryana and Rajasthan)	137	7
Bihar	327	16
Other Indian states	353	18
MARITAL STATUS (N = 2,010)		
Married	1,406	70
Not married	599	30
Widowed	5	0.2

DEMOGRAPHIC CHARACTERISTIC	NUMBER OF RESPONDENTS	SHARE OF THE SAMPLE (%)
VOCATION (N = 2,010)		
Worker	1,173	58
Homemaker	437	22
Student	353	18
Seeking employment	35	2
Retired	12	1
NATURE OF WORK (NO. OF WORKERS = 1,173)		
Office job (government or private)	670	33
Domestic/office help	154	8
Self-employed	143	7
Daily wage laborer	38	2
Part-time work	168	8
PRIVATE VEHICLE OWNERSHIP AND USAGE (N = 2,010)		
Household owns bicycle	135	7
Respondent uses bicycle	21	1
Household owns motorized two-wheeler	980	49
Respondent uses motorized two-wheeler	93	5
Household owns motorized four-wheeler	210	10
Respondent uses motorized four-wheeler	14	1

Source: WRI India authors, based on primary data.

APPENDIX C. ESTIMATION OF EQUIVALENT FARE FOR PINK TICKETS

Delhi's public transport agencies issue a zero-value pink ticket to each woman undertaking a bus trip. The ticket does not record the origin and destination of the trip, nor does it capture the equivalent regular fare for the trip undertaken. For this study, we estimate the value of the pink tickets from the origin and destination bus stops reported by the respondents. We also account for the higher fares of the air-conditioned (AC) buses because women have reported using AC bus services more often due to the zero cost.

We estimate the trip distance along the bus network from the reported origin and destination bus stops. We use the proportion of scheduled trips by AC and non-AC buses as the probability of a female passenger taking a ride on each bus type. In 2022, 18.44 percent of all scheduled trips were made by AC buses while 81.56 percent were made by non-AC buses. For each distance slab, the pink ticket's equivalent fare is calculated as a generalized cost between the fares of AC and non-AC buses in proportion to their share of the scheduled trips, using Equation 1. Table C-1 summarizes the generalized cost for each distance slab.

Equation 1

Generalised ticket cost=

$$\sum_{i=\text{Under 4 km}}^{\text{Above 12 km}} (\text{Share of AC services}_i * \text{AC Ticket cost}_i + \text{Share of NAC services}_i * \text{NAC Ticket cost}_i)$$

For women who reported transferring across multiple buses during a single journey, the total trip distance is equally distributed across the number of transfers reported. The generalized cost of the ticket is assigned to each leg of the journey based on the distance slab of each leg, and the sum of these leg-wise costs is taken as the total journey cost.

For example, for a respondent taking two buses to complete a 10 km journey, we assume that the trip length for each bus is 5 km. Each leg falls under the distance slab of 4–7.9 km and incurs a cost of INR 10.92, as seen in Table C-1. The total cost of the journey is, therefore, $2 * 10.92 = \text{INR } 21.84$.

Table C1 | Summary of generalized cost for each distance slab

TRIP DISTANCE SLAB (KM)	AC		NAC		GENERALIZED PINK TICKET COST (INR) ^a
	SHARE (%)	FARE (INR) ^a	SHARE (%)	FARE (INR) ^a	
Under 4	18.44	10	81.56	5	5.92
4–7.9	18.44	15	81.56	10	10.92
8–9.9	18.44	20	81.56	10	11.84
10–12	18.44	20	81.56	15	15.92
Above 12 m	18.44	25	81.56	15	16.84

Note: AC = air-conditioned. NAC = non-air-conditioned.

a. Average conversion rate in 2023: 1 INR = \$0.0121.

Source: WRI India authors, based on data procured from the Delhi Transport Corporation (DTC).

APPENDIX D. ESTIMATION OF TOTAL RIDERSHIP FROM PINK TICKET SALES

To estimate the number of women passengers from the volume of ticket sales, we consider the average pink ticket sales per day, the proportion of women taking direct buses (as opposed to transfers), and the average trip length for these women determined from the sample. Table D-1 shows the proportion of women taking a direct bus (as opposed to transfers). In other words, out of 100 women, 83 take a direct bus and account for 83 bus trips; 14 women take two buses per journey and account for 28 trips; and 2 women transfer across 3 buses each per journey and account for 6 bus trips (column 3 of Table D-1). In all, 117 bus trips are taken across 100 women. Assuming that the return trip is also made by bus and is similar to the onward journey, the per capita bus trip rate for each female passenger is $(2 \times 117)/100 = 2.34$ bus trips per woman per day, or 2.34 pink tickets per woman per day.

For the sample month, a total of 45.2 million pink tickets were issued. This translates to 1.46 million pink tickets per day (distributed across 31 days), or 1.46 million bus trips taken by women per day. Considering the daily per capita trip rate of 2.34 trips per woman per day, 1.46 million bus trips would translate to 0.623 million women per day. Therefore, the size of the female ridership using the FFPT scheme is estimated to be 0.623 million women per day.

Table D1 | **Share of persons and trips by type of transfer**

NUMBER OF BUSES TAKEN PER JOURNEY	SHARE OF THE SAMPLE (%)	NUMBER OF BUS TRIPS PER 100 WOMEN
1 bus/journey	83	83
2 buses/journey	15	28
3 buses/journey	2	6

Source: WRI India authors, based on primary data.

APPENDIX E. COMPARISON OF REGULAR FARES FOR AC AND NON-AC SERVICES IN DELHI

Table E1 | Fare chart for Delhi bus services

DISTANCE RANGE (KM)	AC BUS FARE (INR) ^a	NON-AC BUS FARE (INR) ^a
Under 4	10	5
4-8	15	10
8-10	20	10
10-12	20	15
Above 12	25	15

Note: AC = air-conditioned. NAC = non-air-conditioned.

a. Average conversion rate in 2023: 1 INR = \$0.0121.

Source: WRI India authors, based on data procured from DTC (2020).

APPENDIX F. ESTIMATING ACCESS TO OPPORTUNITIES

Estimating bus trip lengths

Bus trip length estimation for 2023. The trip length was calculated along the bus network from the respondent's boarding bus stop to the reported destination bus stop. Potential inflation of trip distance from transfers involving detours from this direct route were not included because only 16 percent of the sample reported making trips involving transfers.

Bus trip length estimation for 2019. For women who frequently used the bus in 2019, the bus trip distance slabs were inferred from their reported fare per trip. To adjust for cost inflation from transfer penalties, the trip distance was estimated as a function of the fare slab and the probability of transfers as reported for 2023.

Estimating access to opportunities

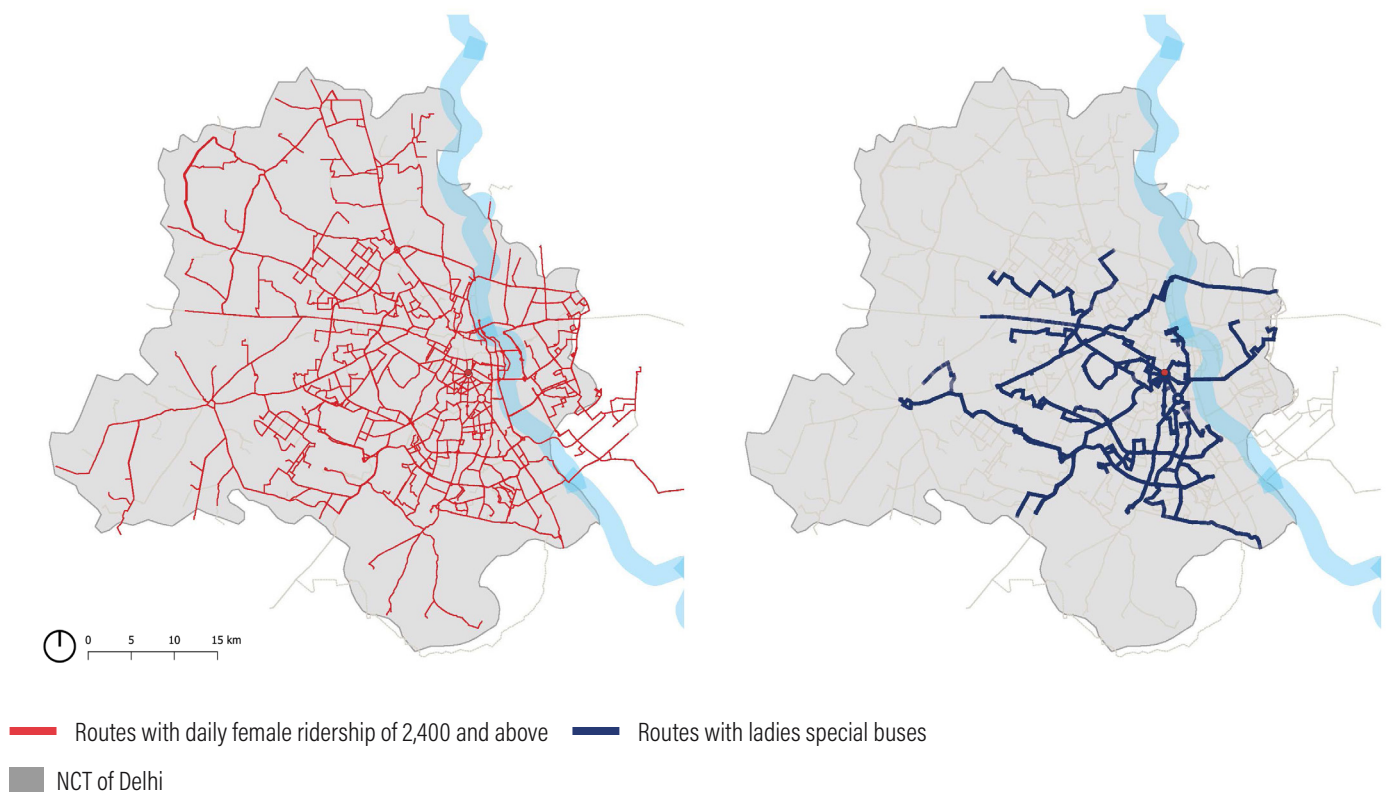
Mapping Points of Interest (POIs). Data from the All India Directory of Establishments (based on the Sixth Economic Census 2013-14) for employment locations and data from Google Places (2023) and OpenStreetMap (2023) for educational institutions and health care facilities were spatialized on a map of the National Capital Territory (NCT) of Delhi.

Accessible opportunities. All opportunities located within a radius equal to the trip length of the respondent are assumed to be "accessible" to the respondent. For the spatial analysis in this study, the radius was calculated along the bus network with the respondent's boarding bus stop as the center. All POIs within 500 m of the "accessible bus network length" are considered "accessible opportunities" for the respondent. This exercise was carried out to estimate the number of accessible opportunities based on their estimated trip lengths in 2019 and 2023.

APPENDIX G. SPATIAL DISTRIBUTION OF ROUTES WITH HIGH FEMALE RIDERSHIP AND LADIES SPECIAL BUSES

The maps in Figure G-1 show the spatial distribution of routes carrying the highest female ridership and the routes operating ladies special buses. Although 71 percent of the ladies special routes are operated along the high-female-ridership corridors, they are concentrated only around the city center.

Figure G1 | **Spatial distributions of ladies special bus routes and regular bus routes with high and low daily female ridership**



Note: NCT = National Capital Territory.

Source: Official data from the DTC for ridership in May 2023 and list of routes with ladies bus services.

APPENDIX H. INTERCEPT SURVEY INSTRUMENT: ENGLISH QUESTIONNAIRE

CONSENT FORM

Script to be read out to the participants:

Hello, my name is _____. I am collecting data on behalf of WRI India to understand **how the current fare-free public transport scheme in Delhi impacts women's travel safety, access to transport, and development opportunities.**

As part of this survey, we will not collect any personally identifiable information like name, address, or phone number, and your data will be completely anonymous. We will ask you about your experience of traveling by bus and your opinion of the bus services. You can choose to end the interview at any point if you are uncomfortable with the questions. If you do not want your data to be used, we will erase all records of your response.

The study will help governments, policymakers, and NGOs understand how women travel and improve bus services for them.

Qualifier questions:

Are you above 18 years of age? (Y – continue/N – end survey)

Do you usually pay for your travel by bus? (Y – end survey/N – continue)

If you have any other questions about our study now or later, you can reach us at aravinda.devaraj@wri.org.

If you agree to participate in the survey, I will record your consent and we will begin now. It will take 30–40 minutes. You can stop me and ask questions during the survey, and also choose not to answer specific questions or not continue the survey.

Do you agree to participate in the survey? (Y – continue/N – end survey)

Q-i: Surveyor name: _____

Q-ii: Survey location: _____

DEMOGRAPHIC DETAILS OF THE RESPONDENT

Read out to respondent: We will ask you a few basic questions about your age, occupation, and household. It will help us understand the profile of bus passengers.

1. What age group do you belong to? [Radio button: Select one]

- a. 18-25 years
- b. 26-40 years
- c. 41-50 years
- d. 51-60 years
- e. Above 60 years
- f. Prefer not to say

2. Which of this best describes you? [Radio button: Select one]

- a. Student
- b. Working
- c. Homemaker
- d. Retired
- e. Looking for work
- f. Other: _____

3. (If answer to Q. 2 is b), what is the nature of your job? [Radio button: Select one]
- a. Office (government or private)
 - b. Self-employed
 - c. Daily wage laborer
 - d. Part-time worker
 - e. I work as a domestic helper
 - f. Other: _____
4. (If answer to Q. 2 is b), what is your average monthly income? [Radio button: Select one]
- a. Under INR 5,000
 - b. INR 5,001–10,000
 - c. INR 10,001–20,000
 - d. INR 20,001–30,000
 - e. INR 30,001–40,000
 - f. INR 40,001–50,000
 - g. INR 50,001–60,000
 - h. Above INR 60,000
 - i. Prefer not to say
 - j. I do not know
5. What is the average monthly income in your family? [Radio button: Select one]
- a. Under INR 5,000
 - b. INR 5,001–10,000
 - c. INR 10,001–20,000
 - d. INR 20,001–30,000
 - e. INR 30,001–40,000
 - f. INR 40,001–50,000
 - g. INR 50,001–60,000
 - h. Above INR 60,000
 - i. Prefer not to say
 - j. I do not know
6. What was your last completed education level? [Radio button: Select one]
- a. Did not go to school
 - b. School (Class 8 or lower)
 - c. School (Class 9–12)
 - d. Graduate college (Diploma or degree)
 - e. Postgraduation or higher
 - f. Any other, please specify: _____
 - g. Prefer not to say

7. Which social group do you identify with? [Radio button: Select one]

- a. General
- b. OBC
- c. SC
- d. ST
- e. Other: _____
- f. Prefer not to say
- g. I don't know

8. What is your marital status? [Radio button: Select one]

- a. a) Married
- b. b) Not married
- c. c) Other: _____
- d. d) Prefer not to say

9. Since when have you been living in Delhi? Year: _____ <allow any integer>

10. Which is your home state? [Radio button – select one] <Drop down list of Indian states>

11. Which of these vehicles do you have at home? [Checkbox: Select all that apply]

- a. Bicycle
- b. Two-wheeler (motorbike or scooter)
- c. Car
- d. None of the above

12. Which of these do you use frequently? [Checkbox, permit multiple selections]

- a. I don't drive
- b. Bicycle
- c. Two-wheeler
- d. Car
- e. None of the above

DETAILS OF THE CURRENT BUS TRIP

Read out to respondent: We will ask you a few questions about the current bus trip you are making.

13. What is the main purpose of your current bus trip? [Radio button: Select One]

- a. Work
- b. Education
- c. Personal Shopping
- d. Household shopping
- e. Medical visit
- f. Social visit
- g. Religious
- h. Pick-up/drop kids off at school
- i. Return home
- j. Other: _____

Read out to respondent: Please describe the end-to-end journey of your current trip

14. How many buses do you have to take as part of this trip?

_____ <allow integer between 1 and 5>

15. Which is the first bus stop where you board the bus?

a. Bus stop name: _____ <drop down menu>

b. Other: _____

16. How do you reach the boarding bus stop? [Radio button: select one]

- a. Walk
- b. Bicycle
- c. Two-wheeler
- d. Car
- e. Dropped off by a family member or others
- f. Auto-rickshaw
- g. Cycle rickshaw
- h. E-rickshaw
- i. Metro
- j. Rapido/bike taxi
- k. Bus
- l. Other: _____

17. (If response to Q. 16 is f, g, h, i, j, k or l), how much does this part of the trip cost?

18. How long does this part of the trip usually take? _____min

19. Which is the last bus stop where you deboard the bus?

a. Bus stop name: _____ <drop down menu>

b. Other: _____

20. How do you go from this bus stop to your final destination? [Radio button: select one]

- a. Walk
- b. Bicycle
- c. Two-wheeler
- d. Car
- e. Dropped off by a family member or others
- f. Auto-rickshaw
- g. Cycle rickshaw
- h. E-rickshaw
- i. Metro
- j. Rapido
- k. Bus
- l. Other: _____

21. (If response to Q. 16 is f, g, h, i, j, k or l), how much does this part of the trip cost? INR _____

22. How long does this part of the trip usually take? _____min

23. Usually, what is the total time spent in waiting for the bus(es) per trip? _____min

GENERAL EXPERIENCE OF BUS TRAVEL

Read out to respondent: We will ask you a few questions about your general experience in traveling by bus

24. In a week, how often do you travel by bus? [Radio button: Select one]

- a. a) 6-7 days per week
- b. b) 4-5 days per week
- c. c) 2-3 days per week
- d. d) One day per week
- e. e) 1-3 days per month
- f. f) Less than once a month

25. On your usual travel by bus in the last 6 months, have you been able to get the seats reserved for women? [Radio button: select one]

- a. I always get a seat in the bus
- b. I usually get a seat during off-peak hours
- c. Men sit on seats reserved for women
- d. When the bus is crowded, seats for women are occupied by other women
- e. Other: _____

26. What are some of the safety-related issues you faced or witnessed while traveling in the bus in the last 6 months? [Checkbox: select all that apply - do not read out to respondents]

- a. Overcrowding
- b. Staring
- c. Cat-calling or rude comments
- d. Groping
- e. Ladies' seats occupied by men
- f. Crowding of men at the doors of the bus
- g. Men sit next to us
- h. Unruly behavior by men
- i. No other women in the bus
- j. Dimly lit bus
- k. No marshals in the bus
- l. Marshals, drivers, or conductors don't help us
- m. Other: _____
- n. Prefer not to say
- o. I have not experienced any safety-related issue

27. How do you usually react when something like this happens? [Checkbox: select all that apply – do not read out to respondents]

- a. I speak out/fight back
- b. I deboard the bus and take a different bus/mode
- c. I take the help of other passengers
- d. I complain to the conductor or driver
- e. I complain to the bus marshal
- f. I use the panic button
- g. I lodge a complaint through the mobile app
- h. I lodge a complaint on the helpline
- i. I lodge a complaint via social media
- j. Other: _____
- k. Prefer not to say
- l. I don't do anything

28. What are some of the other issues you face while traveling by bus in Delhi? [Checkbox: Select all that apply – do not read out the options to the respondent]

- a. My bus ride does not feel safe
- b. There is overcrowding in the bus
- c. The travel time by bus is high
- d. Bus stops are far from my home or work locations
- e. The frequency of bus is low
- f. Buses don't come on time
- g. Buses don't come at the same time everyday
- h. Buses stop far from the bus stops
- i. Fast/rash driving by bus drivers
- j. The cost of the connecting modes is high
- k. Buses break down frequently on my route
- l. Other: _____
- m. Prefer not to say
- n. I have not faced any other issues

29. In the last 6 months, did the buses you traveled by have marshals, police, or security persons on board? [Radio button: Select one]

- a. Most times
- b. Sometimes
- c. Rarely
- d. Never

30. Do you know about the panic buttons on the buses?

- a. a) Yes
- b. b) No
- c. c) Can't say

31. (If answer to Q. 30 is a), how many times have you used the panic buttons in the last 6 months?

a. _____ <allow integer starting from 0>

32. Do you use the physical pink tickets given by the conductor or book them through a mobile app? [Checkbox: select all that apply.

a. Physical tickets

b. Mobile app

IMPACT OF THE FARE-FREE TRAVEL SCHEME ON TRAVEL PATTERNS

Read out to respondents: Finally, we want to understand whether the fare-free bus travel scheme for women has made a difference to the way you travel.

33. What was the mode of travel you used most frequently in Delhi before the free travel scheme was announced? [Radio button: select one]

a. Bus

b. Two-wheeler

c. Car

d. Auto-rickshaw

e. Cycle rickshaw

f. E-rickshaw

g. Metro

h. Bicycle

i. Walk

j. Dropped off by a family member or others

k. I was not in Delhi or traveling regularly

34. How many days in a week did you travel by this mode (the mode mentioned in Q. 33)? [Radio button: select one]

a. 6-7 days per week

b. 4-5 days per week

c. 2-3 days per week

d. One day per week

e. 1-3 days per month

f. Less than once a month

35. What was your average expenditure on travel by this mode (the mode mentioned in Q. 33) per trip? INR _____

36. How important is it for you personally to have access to free bus rides as a woman? [Radio button: select one]

a. Very important

b. Important

c. Makes no difference

d. It brings additional problems

37. If the response to Q. 36 is a or b, can you please specify why? [Checkbox: Select all that apply – do not read out the options to the respondent]

- a. It has reduced my transport expenditure
- b. I can take AC buses more often
- c. I can take more buses on a single trip
- d. I am able to travel more frequently
- e. I can take the bus for other purposes
- f. I am able to travel alone
- g. I am able to travel with my family or friends more often
- h. I am able to visit more places in the city
- i. I am able to travel farther than I used to
- j. Other: _____

38. Do you feel the free rides has resulted in any additional problems for women? [Checkbox: Select all that apply – do not read out the options to the respondent]

- a. Crowding has increased
- b. The bus does not stop when only female passengers are there
- c. Women are discouraged from boarding the bus
- d. Conductor/co-passenger asks me to take the next bus
- e. Men refuse to vacate ladies' seats
- f. Drivers/conductors are rude to female passengers
- g. Other male passengers are rude to female passengers
- h. Conductors don't issue tickets on time
- i. Buses stop far from the bus stops
- j. Other: _____
- k. It has not resulted in any additional problems

39. Would you continue to take the bus if the scheme is discontinued, and you have to pay the full ticket cost? [Radio button – select one]

- a. Yes
- b. No
- c. Other: _____

40. If the response to Q. 39 is no, which mode would you shift to? [Radio button: Select one]

- a. Two-wheeler
- b. Car
- c. Auto-rickshaw
- d. Cycle rickshaw
- e. E-rickshaw
- f. Metro
- g. Bicycle
- h. Walk

ABBREVIATIONS

CCTV	closed circuit television
DTC	Delhi Transport Corporation
DIMTS	Delhi Integrated Multi-modal Transit System
FFPT	fare-free public transport
FGD	focus group discussion
LoS	Level of Service
NCT	National Capital Territory
OBC	Other Backward Class
PTA	public transport agency
SC	Scheduled Caste
ST	Scheduled Tribe
STU	state transport undertaking

GLOSSARY

Bus marshal	Security personnel deployed on Delhi buses to enhance the safety and security of women and children.
cluster buses/services	Bus services operated by private operators coordinated by DIMTS.
gender-disaggregated data	Data collected and tabulated separately for women and men. They allow for the measurement of differences between women and men on various social and economic dimensions and are one of the requirements for obtaining gender statistics. ^a
nonmotorized modes	Also known as “Active Transportation” and “Human Powered Transportation.” It includes walking, bicycling, and variants such as wheelchair travel. ^b
pink ticket/pink pass	A zero-value ticket issued by the transport operator (DTC or DIMTS) per ride to female bus users in Delhi.
public transport agency	Also known as a state transport undertaking, it refers to any undertaking providing road transport service that is owned by a state government or the central government, a road transport corporation, municipality, Zila Parishad, or similar local authority. ^c
transfer penalty	The effort involved in transferring from one vehicle to another in a single journey, captured as a disutility or penalty in transport models. ^d

Source:

a. European Institute for Gender Equality n.d.

b. Victoria Transport Institute 2018.

c. Indian Kanoon n.d.

d. Garcia-Martinez et al. 2018.

ENDNOTES

1. Delhi's FFPT scheme covered only women and girls at the time of this study; it has since been extended to the transgender community.
2. Our sample consists of students above 18 years of age; hence, the reported findings may not be representative of all student groups.

REFERENCES

- Alam, Muneeza Mehmood, Maureen Cropper, Matías Herrera Dappe, and Palak Suri. 2021. *Closing the Gap: Gender, Transport and Employment in Mumbai*. Policy Research Working Paper 9569. Washington DC: World Bank. <http://hdl.handle.net/10986/35248>.
- Alonso-Epelde, E., X. García-Muros, and M. González-Eguino. 2023. 'Transport Poverty Indicators: A New Framework Based on the Household Budget Survey'. *Energy Policy* 181 (October): 113692. doi:10.1016/j.enpol.2023.113692.
- Amaral, Sofia, Girija Borker, Nathan Fiala, Anjani Kumar, Nishith Prakash, and Maria Micaela Sviatschi. 2023. "Sexual Harassment in Public Spaces and Police Patrols: Experimental Evidence from Urban India." Working Paper. Working Paper Series. National Bureau of Economic Research. doi:10.3386/w31734.
- ANI (Asian News International). 2023. "Delhi Expands Electric Bus Fleet: 400 New Buses Flagged Off." *The Economic Times*, September 5. <https://economictimes.indiatimes.com/news/india/delhi-expands-electric-bus-fleet-400-new-buses-flagged-off-articleshow/103384383.cms>.
- Bansal, Taruna, Pritha Roychowdhury, Pankaj Rawat, Awadh Narayan Choubey, and Md. Nurul Hoda. 2022. "Gender and Smart City: Canvassing (In)Security in Delhi." *GeoJournal* 87 (3): 2307-25. doi:10.1007/s10708-020-10369-z.
- Borker, Girija. 2021. *Safety First: Perceived Risk of Street Harassment and Educational Choices of Women*. Policy Research Working Paper 9731. Washington, DC: The World Bank. doi:10.1596/1813-9450-9731.
- Briche, Henri, and Maxime Huré. 2018. "Dunkirk as a New 'Laboratory' for Free Transit." Translated by Oliver Waine. *Metropolitica*. <https://metropolitica.org/Dunkirk-as-a-New-Laboratory-for-Free-Transit.html>.
- Centre for Market Research and Social Development. 2020. *Study on Impact of Subsidies of the Delhi Government on the Socio-Economic Status of Citizens and the Local Community*. New Delhi: Planning Department, Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/generic_multiple_files/study_on_impact_of_subsidies_of_the_delhi_government_on_the_socio-economic_status_of_citizens_and_the_local_community.pdf.
- Chakrabarty, Sreeparna. 2023. "Are Crimes against Women on the Rise?—Explained". *The Hindu*, December 9, sec. India. <https://www.thehindu.com/news/national/are-crimes-against-women-on-the-rise-explained/article67622430.ece>.
- Chowdhury, Subeh, and Bert Wee. 2020. "Examining Women's Perception of Safety during Waiting Times at Public Transport Terminals." *Transport Policy* 94 (May): 102-108. doi:10.1016/j.tranpol.2020.05.009.
- Dasgupta, Aparajita, and Ashokankur Datta. 2023. *Gendered Transport Subsidy and Its Short Run Effect on Female Employment: Evidence from Delhi's Pink Pass Scheme*. Ashoka University Economics Discussion Paper 105, October. Sonapat, Haryana, India: Ashoka University. https://dp.ashoka.edu.in/ash/wpaper/paper105_0.pdf.
- Delhi Development Authority. 2021. *Master Plan for Delhi—2021*. New Delhi: Delhi Development Authority. https://dda.gov.in/sites/default/files/inline-files/Master_Plan_for_Delhi_2021_text_report.pdf.
- DTC (Delhi Transport Corporation). 2020. "Fare Stages and Fare Charts." MS Excel. <https://dct.delhi.gov.in/dtc/services>.
- EU Urban Mobility Observatory. 2021. "Free Passenger Transport"—Exploring the Benefits and Disadvantages." European Commission. https://urban-mobility-observatory.transport.ec.europa.eu/resources/case-studies/free-passenger-transport-exploring-benefits-and-disadvantages_en.
- European Institute for Gender Equality. n.d. "Sex-Disaggregated Data." European Institute for Gender Equality. https://eige.europa.eu/gender-mainstreaming/tools-methods/sex-disaggregated-data?language_content_entity=en.
- Falor, Sanskriti. 2023. "Bus Drivers Do Not Stop for Women Passengers: Delhi CM Kejriwal Lists Free Bus Ride as Reason." *Hindustan Times*, May 18. <https://www.hindustantimes.com/cities/delhi-news/bus-drivers-do-not-stop-for-women-passengers-delhi-cm-kejriwal-lists-free-bus-ride-as-reason-101684392131668.html>.
- Farooq, Aakiz, and Avni Goyal. 2023. *Halt for Women Bus Users in Delhi*. New Delhi: Greenpeace India. <https://www.greenpeace.org/india/en/publication/16078/halt-for-women-bus-users-in-delhi/>.
- Fearnley, Nils. 2013. "Free Fares Policies: Impact on Public Transport Mode Share and Other Transport Policy Goals." *International Journal of Transportation* 1 (1): 75-90. doi:10.14257/ijt.2013.1.1.05.
- Garcia-Martinez, Andres, Rocio Cascajo, Sergio R. Jara-Diaz, Subeh Chowdhury, and Andres Monzon. 2018. "Transfer Penalties in Multimodal Public Transport Networks." *Transportation Research Part A: Policy and Practice* 114: 52-66.
- Graham-Harrison, E. 2015. "Women-Only Carriages around the World: Do They Work?" *The Guardian*, August 26. <https://www.theguardian.com/world/2015/aug/26/women-only-train-carriages-around-the-world-jeremy-corbyn>.
- Indian Kanon. n.d. "Section 2(42) in The Motor Vehicles Act, 1988." Indian Kanon. <https://indiankanon.org/doc/104684603/>.
- Kejriwal, Arvind. 2019. "Free Transport: Delhi Government's Landmark Move to Empower Women, Give Them Greater Claim to Public Spaces." *The Times of India*, November 3. <https://timesofindia.indiatimes.com/blogs/for-the-people/free-transport-delhi-governments-landmark-move-to-empower-women-give-them-greater-claim-to-public-spaces/>.

- Lecompte, María Carolina, and Bocarejo S. Juan Pablo. 2017. "Transport Systems and Their Impact on Gender Equity." In *Transportation Research Procedia*, 25 (January): 4245–57. Paper presented at the World Conference on Transport Research—WCTR 2016, Shanghai, July 10–15, 2016. doi:10.1016/j.trpro.2017.05.230.
- Madariaga, Inés Sánchez de. 2013. "Mobility of Care: Introducing New Concepts in Urban Transport." In *Fair Shared Cities: The Impact of Gender Planning in Europe*, edited by Inés Sánchez de Madariaga and Marion Roberts, 33–48. Routledge.
- Mieleszko, Asia. 2024. "Lessons from Estonia: Free Fares Alone Won't Boost Ridership." Strong Towns. <https://www.strongtowns.org/journal/2023/10/26/lessons-from-estonia-free-fares-alone-wont-boost-ridership>.
- Ministry of Housing and Urban Affairs. 2021. "Pradhan Mantri Awas Yojana (Urban) Housing for All Mission Scheme Guidelines." PMAY-Urban. <https://pmay-urban.gov.in/guideline>.
- Ministry of Statistics and Programme Implementation. 2014. "Directorate of Establishment (State/UT Wise Codes)." *Sixth Economic Census 2012–13*. https://www.mospi.gov.in/sites/default/files/6ec_dirEst/ec6_State_UTs_wise.html.
- Ministry of Urban Development. 2017. *Service Level Benchmarks for Urban Transport at a Glance*. New Delhi: Ministry of Urban Development, Government of India. [The Ministry of Urban Development is now the Ministry of Housing and Urban Affairs.]
- National Transport Authority (NTA). 2022. *Fare Free Travel Policy Analysis*. Dublin, Ireland: NTA. <https://www.nationaltransport.ie/publications/fare-free-travel-policy-analysis/>.
- Nawaz, M. 2018. "Increase in Women-Only Buses Eases Transport Anxieties," November 4. *UN Women—Asia-Pacific*. <https://asiapacific.unwomen.org/en/news-and-events/stories/2018/11/increase-in-women-only-buses-eases-transport-anxieties>.
- Ng, Wei-Shiuen, and Ashley Acker. 2018. *Understanding Urban Travel Behaviour by Gender for Efficient and Equitable Transport Policies*. International Transport Forum Discussion Paper. Paris: International Transport Forum. doi:10.1787/eaf64f94-en.
- Nikore, Mitali, and Gerald Ollivier. 2022. "India: Making Public Transport More Women-Friendly." *World Bank Blogs*. <https://blogs.worldbank.org/en/endpovertyinsouthasia/india-making-public-transport-more-women-friendly>.
- OpenStreetMap Contributors. 2023. "Planet Dump." [Data file from May 11, 2023]. <https://planet.osm.org>.
- Planning Department. 2019. *Delhi Outcome Budget 2019–20*. New Delhi: Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/4_public_finance.pdf.
- Planning Department. 2020. *Delhi Outcome Budget 2020–21*. New Delhi: Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/e4_pf.pdf.
- Planning Department. 2021. *Delhi Outcome Budget 2021–22*. New Delhi: Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/ch_4_public_finance_1.pdf.
- Planning Department. 2022a. *Economic Survey 2021–22*. New Delhi: Government of NCT of Delhi. <https://delhiplanning.delhi.gov.in/planning/economic-survey-2021-22>.
- Planning Department. 2022b. *Delhi Outcome Budget 2022–23*. New Delhi: Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/UD/generic_multiple_files/ob_2022-23.pdf.
- Planning Department. 2023a. *Economic Survey of Delhi, 2022–23*. New Delhi: Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/ch_12_transport_0_0.pdf.
- Planning Department. 2023b. "Monthly Progress Report in Respect of Schemes/Programmes/Projects." Government of NCT of Delhi. https://delhiplanning.delhi.gov.in/sites/default/files/Planning/generic_single_files/sector-deptt-schemewise_exp_upto_march_23.pdf.
- Prague Morning. 2019. "Prague to Make Public Transport Free on High Air Pollution Days." *Prague Morning*, January 23. <https://praguemorning.cz/prague-to-make-public-transport-free-on-high-air-pollution-days-viaquadex/>.
- Praja Foundation and IC Centre for Governance. 2019. *State of Policing and Law & Order in Delhi*. Mumbai: Praja Foundation and New Delhi: IC Centre for Governance. https://www.praja.org/praja_docs/praja_downloads/Delhi%20Crime%20White%20Paper%202018.pdf.
- PTI (Press Trust of India). 2015a. "GPS in Public Transport Mandatory in Delhi." *Times of India*, June 3. <https://timesofindia.indiatimes.com/delhi/gps-in-public-transport-mandatory-in-delhi/article-show/47524333.cms>.
- PTI. 2015b. "Delhi Government Allots 160 Crore for CCTVs, Marshals in DTC Buses." *The Economic Times*, June 25. <https://economictimes.indiatimes.com/news/politics-and-nation/delhi-government-allots-160-crore-for-cctvs-marshals-in-dtc-buses/articleshow/47820803.cms>.
- PTI. 2019. "10% Rise in Female Commuters in Delhi's Public Buses since Free-Ride Scheme Launch." *Business Today*, November 21. <https://www.businesstoday.in/latest/economy-politics/story/10-rise-in-female-commuters-in-delhi-public-buses-since-free-ride-scheme-launch-240094-2019-11-21>.
- Ratho, Aditi, and Shruthi Jain. 2021. *Women on the Move: The Impact of Safety Concerns on Women's Mobility*. New Delhi: Observer Research Foundation. https://www.orfonline.org/wp-content/uploads/2021/05/ORF_Monograph_WomenOnTheMove.pdf.
- Shah, Sonal, Rithvika Madhumal Rajiv, and Abjijit Lokre. 2023. "Moving toward Gender-Equitable Transportation in Post-COVID-19 Urban South Asia." *Transportation Research Record* 2677 (4): 865–879. doi:10.1177/0361198122111369.

Shah, Sonal, Kalpana Viswanath, Sonali Vyas, and Shreya Gade-palli. 2017. *Women and Transport in Indian Cities*. Policy Brief. New Delhi: ITDP (Institute of Transportation and Development Policy) and Safetipin. https://itdp.in/wp-content/uploads/2018/01/181202_Women-and-Transport-in-Indian-Cities.pdf.

Štraub, Daniel. 2016. "Koncept bezplatné hromadné dopravy ve městech" ["Free Fare Transport Policy in Urban Areas"]. Bachelor's Thesis. Univerzita Karlova, Přírodovědecká fakulta. <https://dspace.cuni.cz/handle/20.500.11956/77813>.

Suman, Hemant K., Nomes B. Bolia, and Geetam Tiwari. 2017. "Comparing Public Bus Transport Service Attributes in Delhi and Mumbai: Policy Implications for Improving Bus Services in Delhi." *Transport Policy* 56 (May): 63–74. doi:10.1016/j.tranpol.2017.03.002.

Swarajya Staff. 2018. "Delhi: After Molestation Incident, DTC Announces Ladies Special Buses for Route 544." *Swarajya*. October 19. <https://swarajyamag.com/insta/delhi-after-molestation-incident-dtc-announces-ladies-special-buses-for-route-544>.

The Times of India. 2024. "Free Travel for Women: 150 cr Pink Tickets Issued," November 6. <https://timesofindia.indiatimes.com/city/delhi/delhi-issues-150-crore-free-pink-tickets-for-women-a-milestone-in-public-transport/articleshow/114991327.cms>.

Tiwari, Ananya. 2019. "13,000 Marshals on Delhi Buses as Free Rides for Women Take Off." *The Indian Express*, October 29. <https://indianexpress.com/article/cities/delhi/13000-marshals-on-buses-as-free-rides-for-women-take-off-6092046/>.

United Nations Publications. 2019. *World Urbanization Prospects: The 2018 Revision*. New York: The United Nations. <https://www.un.org/en/desa/2018-revision-world-urbanization-prospects>.

Victoria Transport Institute. 2018. "Nonmotorized Transport Planning: Identifying Ways to Improve Pedestrian and Bicycle Transport." *Online TDM Encyclopedia*. <https://www.vtpi.org/tdm/tdm25.htm>.

Volinski, Joel. 2012. *Implementation and Outcomes of Fare-Free Transit Systems*. 213. TCRP Synthesis 101. Washington, D C: Transportation Research Board. doi:10.17226/22753.

ACKNOWLEDGMENTS

The authors extend their gratitude to Pawan Mulukutla (Executive Program Director—Integrated Transport, Clean Air & Hydrogen, WRI India) and Shahana Chattaraj (Director of Research, Equity Centre, WRI) for their strategic guidance and support throughout this research. We acknowledge the contributions of our colleagues Aparna Vijaykumar, Mitasha Duggal, and Mahak Dawra, and our internal reviewers—Aloke Mukherjee, Azra Khan, Sudeshna Chatterjee and Mirza Firoz Beg—for their insightful feedback. We are equally grateful to our external reviewers, Kalpana Viswanath (Co-founder and CEO, Safetipin), Palak Suri (Assistant Professor of Economics, West Virginia University) and Seema Singh (Transportation Equity Expert, Cambridge Systematics Inc.), for their expert insights.

A special thanks to Kathleen Schalch for the constructive feedback, which greatly enriched the paper's structure and arguments. Lastly, we appreciate the administrative, editorial, and design support provided by Ankita Rajeshwari, Rama Thoopal, Allison Meyer, Emily Matthews, Renee Pineda, and Santhosh Matthew Paul.

This Working Paper was developed with support from the NDC-Transport initiative for Asia (NDC-TIA), a multi-partner initiative that is part of the International Climate Initiative (IKI), which works under the Federal Ministry for Economic Affairs and Climate Action of the German Government.

ABOUT THE AUTHORS

Harshita Jamba is a Program Manager with the Integrated Transport, Sustainable Cities Program at WRI India.

Aravinda Devaraj is a Senior Program Research Analyst with the Integrated Transport, Sustainable Cities Program at WRI India.

Chaitanya Kanuri is the Associate Director of Electric Mobility in the Sustainable Cities Program at WRI India.

ABOUT WRI INDIA

WRI India, an independent charity legally registered as the India Resources Trust, provides objective information and practical proposals to foster environmentally sound and socially equitable development. Our work focuses on building sustainable and liveable cities and working towards a low carbon economy. Through research, analysis, and recommendations, WRI India puts ideas into action to build transformative solutions to protect the earth, promote livelihoods, and enhance human well-being. We are inspired by and associated with World Resources Institute (WRI), a global research organization. Know more: www.wri-india.org

Our challenge

Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our approach

COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT

We use our research to inform government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT

We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.



Copyright 2025 WRI India. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/>