

# Gender, Welfare, and Mobility

## Impact of Shakti Scheme on BMTCT Transport Transformation



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# **Gender, Welfare, and Mobility: Impact of Shakti Scheme on BMTC Transport Transformation**

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# Executive summary

## 1. Transformational impact on women's mobility

The Shakti scheme, launched in June 2023, provides free bus travel for resident women in Karnataka, leading to an immediate and sustained surge in Bengaluru Metropolitan Transport Corporation (BMTC) ridership. Women now outnumber men on many key routes, especially in Bengaluru's Central Business District (CBD), signalling a structural shift in urban mobility and access to opportunities.

## 2. Fiscal sustainability and revenue balance

Preliminary evidence suggests that while subsidies slightly exceed fare revenue, the difference is relatively narrow, and the system shows signs of balance between Shakti and non-Shakti riders. However, the long-term fiscal sustainability of the scheme remains uncertain, given possible crowding, uneven subsidy-to-revenue ratios across routes, and the need for ongoing government support.

## 3. Spatial and social equity effects

Ridership gains are concentrated in northern, western, and central Bengaluru, with weaker uptake in the eastern peripheries due to weaker BMTC coverage and migrant women's exclusion. Case studies show strong benefits for industrial-residential hubs (e.g., Jalahalli, Peenya), and no significant disparities in usage between wards with high and low SC/ST populations.

## 4. Labour market and welfare linkages

The scheme plausibly expands women's effective access to jobs, education, and health care by removing transport costs. Some studies suggest an improvement in female labour force participation and changes in time use, though direct causal evidence from Bengaluru remains limited. At the very least, the scheme appears to ease a key constraint on women's mobility that has historically shaped their economic and social opportunities.

## 5. Policy imperatives for the future

The report stresses three priorities: (i) expanding BMTC capacity (fleet size, frequency, integration with metro) to absorb demand; (ii) improving last-mile connectivity to ensure genuine universality; and (iii) extending benefits to migrant women, who remain excluded despite being among the city's most mobility-constrained groups.

## CHAPTER 1:

# Introduction

The Shakti scheme, launched by the Government of Karnataka in June 2023, represents one of the most ambitious efforts in India to reimagine welfare by providing free public transport for women. Unlike welfare programmes based on targeted cash transfers, this scheme redefines inclusion through the provision of a universal, non-cash public service mobility. In its early months of implementation, the scheme had already begun to reshape the travel patterns of women across the state, particularly in urban Bengaluru, where the Bengaluru Metropolitan Transport Corporation (BMTc) operates the state's largest and most complex public transport network.

This report is an assessment of the evolution of the scheme with specific regard to the BMTc's experience. In the period studied— January 2023 to March 2025, covering both pre- and post-implementation phases—the scheme generated a significant surge in bus usage across the state. With more than 2.89 crore trips recorded, a striking transformation in mobility patterns was observed. Importantly, women riders quickly outnumbered men on many of the busiest routes— especially in the Central Business District, reflecting a major shift in access to and usage of public transport. The ridership gains were particularly sharp in the first six months following the scheme's launch and have since stabilised, indicating a sustained and regular usage pattern among women.

A key feature of the scheme's impact is the relative balance between increased usage and associated costs. While the total daily revenue (inclusive of the government subsidy component) rose proportionally with the rise in ridership, the cost of subsidising Shakti trips turned out to be slightly higher than the revenue collected from non-beneficiary riders. This suggests that although the scheme boosts total bus system usage and generates economic and social value, it also entails some fiscal burden. Certain routes showed a much higher subsidy-to-revenue ratio, indicating that the cost of service provision was not uniform across the network. This creates an important policy question around balancing equity and financial sustainability— ensuring that the scheme serves its social purpose while managing long-term costs.

Route-level analysis also reveals spatial variation in the uptake and intensity of the scheme. Women's ridership gains were most concentrated in northern, western, and central Bengaluru, while eastern zones saw relatively lower participation. Taken together, the findings point to a transformation in the use and meaning of public transport for women in Karnataka. The Shakti scheme has effectively removed one of the major barriers to mobility— cost— and in doing so, has likely expanded women's access to employment, education, and social networks. The evidence shows both aggregate improvements and

spatial heterogeneity, underscoring the need for ongoing monitoring and responsive policymaking. As the scheme evolves, further attention must be paid to ensure that infrastructure, bus frequency, and last-mile connectivity keep pace with the increased demand, and that the social gains from enhanced female mobility are matched by improvements in quality, safety, and inclusivity across the transport system.

The report is divided into three sections. In the first, we discuss state-level free travel schemes. We address certain questions about Karnataka's experience within wider debates about universalism versus targeting in social policy. In the second, we discuss our report, its methods and our findings. In the final section, we discuss some potential paths forward.

## 1.1 State-level free travel schemes and their assessment

Karnataka is not alone in experimenting with free public transport for women. Delhi introduced a similar initiative in 2019 across Delhi Transport Corporation (DTC) and Cluster buses, supported by subsidies from the state government. There, the focus was explicitly tied to safety and economic participation. Studies show that women in Delhi not only increased their commuting frequency but also exhibited higher labour force participation in the months following the scheme's introduction<sup>1</sup>. In Tamil Nadu, free travel for women was introduced in 2021 on ordinary buses. Reports from surveys by the CAG suggest notable positive impacts in terms of access to work, although limitations in service frequency and quality have constrained the programme's full impact<sup>2</sup>.

There have been several attempts to analyse these effects. Chen et al. (2024), study Indian states that introduced the free bus programme for women and examine labour supply and time use shifts. They find that skilled employed women had increased labour hours, while low-skilled married women reallocated time to household chores, and unemployed women intensified job searches. Delhi's Pink Ticket scheme has also been evaluated using mixed methods. Jamba, Kanuri & Devaraj<sup>3</sup> (2023) conducted household surveys and analysed transport usage data to measure ridership change, finding female usage rose from ~33 percent to ~42 percent between 2019–2023, with average monthly savings of INR500–INR2,300. Survey respondents reported reallocating savings toward household and health expenditures.

Underlying these scheme-specific studies are broader gendered mobility analyses. Goel (2022), suggests 53 percent of urban women reported no out-of-home mobility on a given day, compared to just 14 percent of men. Mobility sharply declined after adolescence for women, linked to marriage, infant care, lower income, and education levels. Similarly, Gosavi & Dittakavi (2024) document commuting constraints particular to Indian women in urban and rural settings, reinforcing how socio-cultural norms restrict mobility.

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1. <http://www.nber.org/papers/w32508>

2. <https://www.theindiaforum.in/forum/freebie-or-freedom-tamil-nadus-free-bus-scheme-women>

3. <https://wri-india.org/research/fare-free-bus-travel-scheme-women-lessons-delhi>

Karnataka's Shakti scheme has been analysed via survey data. A study by the Fiscal Policy Institute–JustJobs Network covering ~26,000 women revealed a rise in female labour force participation from 25.3 percent to 30.2 percent in the first year. Respondents also reported enhanced access to jobs (57 percent) and community participation (49 percent).

## 1.2 Cash transfers vs free public services: A policy crossroads

At its core, the Shakti scheme is a response to multiple, overlapping constraints in women's access to opportunity: the stagnation of female workforce participation, rising household transport costs, and the chronic under-provision of safe, reliable, and affordable public transport. Rather than extending a cash benefit to women, the scheme makes travel free on state-run non-premium buses, thereby creating the conditions for unrestricted, spontaneous mobility. This form of in-kind public service provision stands in contrast to the dominant turn toward cash transfer welfare.

The Shakti scheme also raises a more general question in Indian social policy: are in-kind public goods like free transport superior to individualised cash transfers? Economists have long debated this trade-off. Cash transfers are administratively simple and offer beneficiaries autonomy. But their success presumes the existence of functioning markets and service systems. Free bus travel, in contrast, ensures access but may reduce fiscal discipline in public transport and/or depends on its desirability.

Cash transfers offer recipients flexibility in how they use resources, and may be cheaper to administer. This noted, they do not address structural bottlenecks—like the absence of safe and affordable buses—that shape access in the first place. By contrast, universal access to transport, especially in cities, expands the capability set of women: they can search for better jobs, attend college, visit health care facilities, extend their range of shopping, or participate in civic life without being limited by the cost of travel.

Such a scheme can potentially alter the social geography of opportunity itself. Mobility is not a fungible good. Giving women INR 1,000 a month does not solve the structural problem of unsafe or unavailable transport. By providing a service, the state shapes patterns of usage, alters social norms (e.g., women travelling alone at night), and generates externalities (reduced congestion, increased economic participation). In this sense, public goods, especially those tied to spatial mobility, cannot be substituted by cash.

Critics of the Shakti scheme have raised concerns that it is being misused for leisure travel, rather than serving its intended purpose of enabling women's essential movement. Media reports noted women boarding buses in groups to undertake pilgrimages and non-work trips. Reports highlighted overcrowding in buses and questioned the sustainability of providing zero-fare travel if it primarily enabled leisure trips rather than productive commuting<sup>4</sup>. One test of this is whether patterns of commuting changed within a particular area, and if so, did it suggest more use for work, education, health care, and social mobility. We do so here by focussing on patterns within Bengaluru city.

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4. [CNBC TV18](#), [The Indian Express](#)

## 1.3 BMTC and the urban transport challenge in Bengaluru

Among the four State Transport Undertakings (STUs) implementing Shakti—KSRTC, NWKRTC, KKRTC, and BMTC—it is BMTC that has faced the greatest operational transformation. Bengaluru, a city with over a crore residents and some of India’s worst traffic congestion, is served solely by BMTC’s fleet of around 6,500 buses. Its ridership had been declining for years, displaced by rising private vehicle use and inadequate integration with metro and last-mile services<sup>5</sup>.

The implementation of the Shakti scheme, however, produced a dramatic reversal. Within the first three months, BMTC’s daily ridership rose by nearly 40 percent, with women accounting for more than half of all passengers. The next section details the pattern of changes.

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5. <https://www.moneycontrol.com/news/business/reversing-the-trend-bengalurus-bmtc-regains-ridership-with-free-bus-travel-for-women-10846551.html>

## CHAPTER 2:

# Our study

BMTC collects granular, disaggregated data for each trip made by a specific bus in a specific route, based on the entries recorded by conductors. We obtained this data via BMTC officials who collated these records from all the bus depots spread across the city. The data collected by BMTC further provides the exact number of passengers in a specific trip who used Shakti scheme, as well as those who travelled in that same trip without using the scheme. By the design of the scheme, we know that all Shakti scheme users must be women, however, one cannot confirm that all non-Shakti passengers are necessarily men. This is because the scheme allows only residents to avail the scheme. This caveat however does not alter any of our claims. This is because in most cases our outcome of interest is the bus ridership for women, and thus in the worst-case scenario, our results will be undercounting women passengers. In addition, the trip level data also provides total revenue from non-Shakti tickets as well as the foregone revenue (henceforth, Shakti subsidy) for each trip made by the buses.

We analyse data from 2.89 crore such trips made by BMTC operated buses between January 2023 and January 2025. Shakti scheme came into effect on 11 June 2023, which implies we can compare 6 months of trip-level data before the scheme is implemented, and 18 months post implementation. Our analysis can broadly be divided into three subsections. First, we present a set of basic statistics on ridership and revenue (vis-a-vis subsidy) trends before and after the implementation of the scheme. Second, we provide two specific case studies. Third, we present some evidence on how the scheme potentially enables women in terms of accessing labour markets. Each of these subsections include a detailed note on how we use the data for the corresponding analysis.

## 2.1 Ridership and revenue trends

In this section, we present the basic statistics of ridership and revenue trends for 2.7 crore trips analysed<sup>6</sup>.

Table 1a presents a simple comparison of daily average ridership and revenue before and after the implementation of the scheme. We observe a sharp rise in both after the implementation of the scheme. Table 1b provides estimates of men and women riders in these two periods based on two assumptions.

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6. The interested readers may note how we use the data for this specific purpose. First, we drop approximately 6 lakh trips from our analysis as these trips do not reflect the exact date on which these trips were made. Second, we look at the spread of the data to identify both statistical outliers as well as what we identify as *unusual* trips. For example, we do not include around 5 lakh trips that carried more than 500 passengers on a single trip. We do not lose much insight since these trips constitute only the top 1 percentile of all trips in terms of ridership. Within these 99 percentile of trips, we further drop all trips that report extremely high revenue (greater than INR 6000 in non-Shakti revenue for one single trip). Finally, we drop all duplicate entries, which leaves us with a cleaned data of approximately 2.7 crore unique trips. All tables and figures presented in this subsection are based on the analysis of these 2.7 crore trips.

First, according to BMTC officials, the number of women passengers has historically not crossed 40 percent before the scheme's implementation. Second, we assume that of all the non-Shakti passengers, a maximum of 5 percent could be women who are interstate migrants. Table 1b shows that the number of women passengers has gone up sharply, by about 151.3 percent, since the launch of the Shakti scheme.

**Table 1a: Average ridership and revenue of BMTC buses**

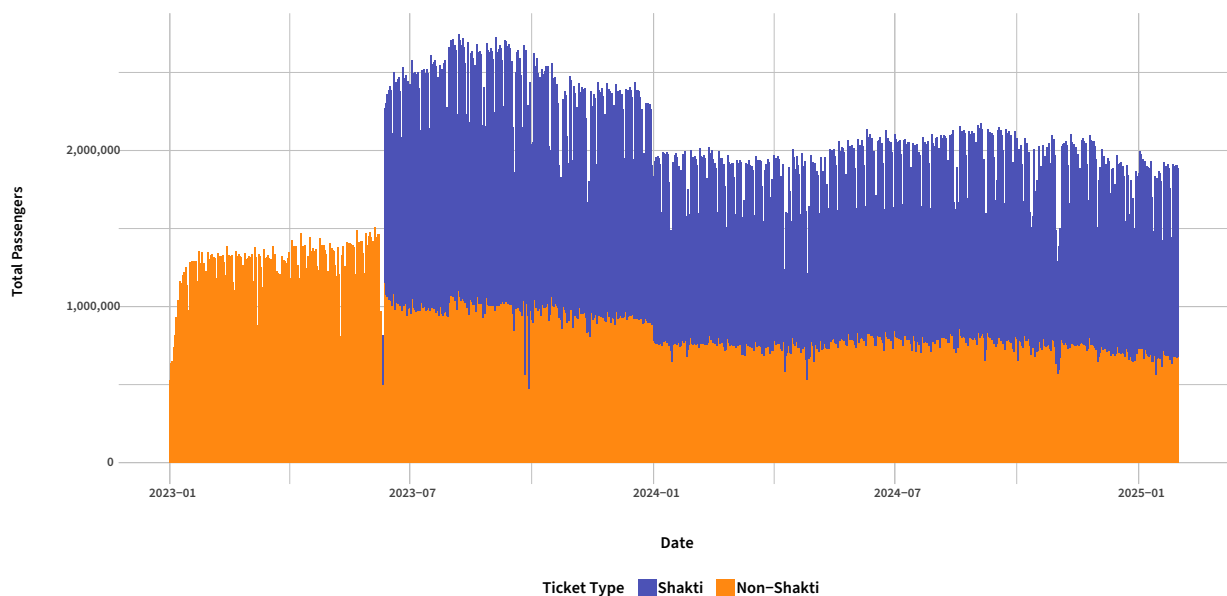
Ticket Type	Metric	Pre-Shakti	Post-Shakti
Non-Shakti	Daily Average Passengers	1,265,696	823,536.90
	Daily Average Revenue	18,482,975	12,473,9300
Shakti	Daily Average Passengers	0	1,231,022.60
	Daily Average Revenue	0	15,852,7110

**Table 1b: Average ridership and revenue of BMTC buses, disaggregated by Gender**

Category	Metric	Pre-Shakti	Post-Shakti	Percentage Change
Male	Daily Average Passengers	759,417.05	782,360.00	3.02 %
Male	Proportion	0.60	0.38	
Female	Daily Average Passengers	506,278.40	1,272,199.40	151.30 %
Female	Proportion	0.40	0.62	

*Note: Values based on assumptions outlined above*

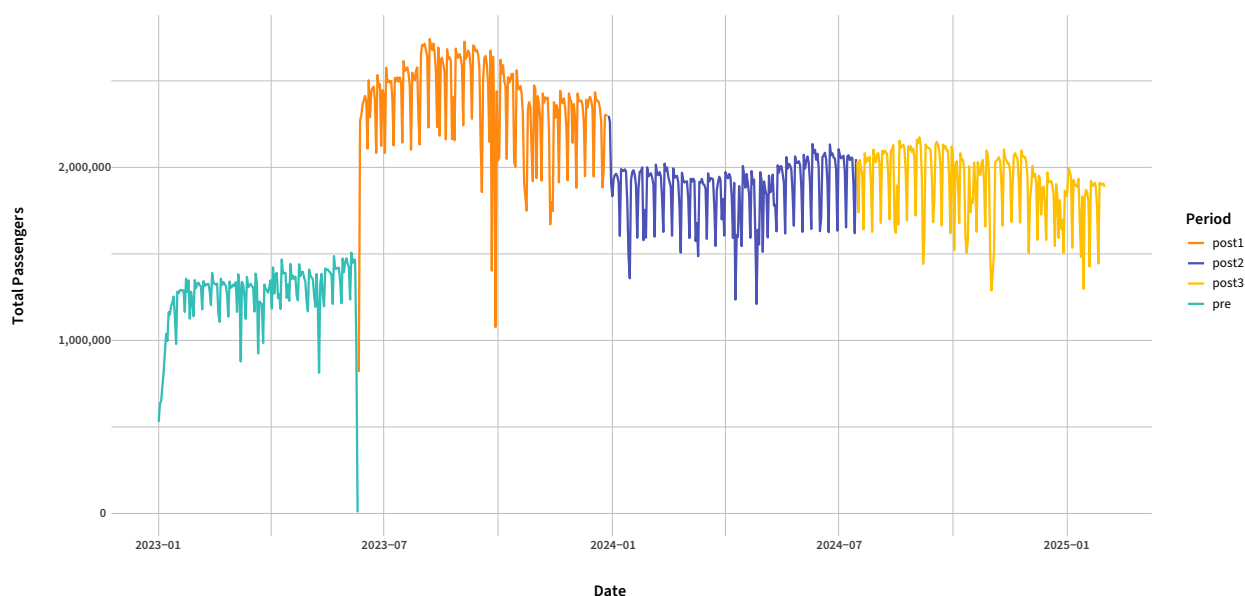
Figure 1 presents the daily ridership of BMTC buses over a period of 160 days before and 600 days after the launch of the Shakti scheme on 11 June 2023. Each bar reflects the total number of passengers travelling in BMTC buses on a specific date, and within each bar, the orange part refers to the share of non-Shakti passengers on that day (and the share of Shakti passengers shaded in blue). Before the scheme's implementation, the daily ridership remained relatively consistent, indicating stable commuting patterns among bus users. However, immediately after the implementation, there is a rapid and substantial increase in ridership, as reflected by the height of the bars. This rise is notably sharp in the initial weeks, illustrating a spike that significantly surpasses pre-scheme levels. After the initial surge, the ridership comes down to a relatively stable level, which sustains substantially at a higher level than pre-implementation ridership averages throughout the period of analysis.



**Figure 1: Daily ridership trends: Shakti vs non-Shakti**

This dramatic initial spike underscores the immediate and significant impact of the Shakti scheme. It possibly indicates a strong latent demand for affordable public transportation among women, previously unmet due to socio-economic constraints. According to research by Uteng and Turner (2019), affordability is one of the most critical factors affecting women's mobility, especially in developing countries. Studies of gender and transport in Indian cities, too, indicate that women's mobility choices are particularly sensitive to cost reductions, resulting in rapid initial adoption of subsidised or free transit schemes (Anand & Tiwari, 2006; Srinivasan, 2008). The figure also clearly illustrates the difference in daily ridership trends in the share of Shakti and Non-Shakti passengers. Post-implementation, Shakti riders consistently outnumber non-Shakti riders on a daily basis, a trend that holds robustly throughout the period observed. The immediate increase and subsequent stabilisation therefore suggest that Shakti scheme successfully lowered the financial barriers restricting women's mobility, resulting in lasting behavioural change. This finding aligns with research highlighting gender-sensitive transport policies as essential tools for promoting gender equality, access to employment, and economic empowerment (Peters, 2013; Lucas, 2012).

Figure 2 traces the daily ridership trends but divides the post-implementation period in three windows of six months each. It is immediately apparent that the first six months witnessed a sustained increase which falls and reaches a stable level from January 2024 approximately. While it is impossible to discern why the initial ridership trend takes about six months before it wanes away, there are several social and economic factors that can predict why such a fall may happen.



**Figure 2: Daily ridership trends before and after the Shakti scheme's launch**

*Note: In this analysis, we divide the entire period into four parts. All days before the launch of the Shakti scheme is coded as 'pre', and all days after the Shakti scheme launch (till January 2025) is divided in three equal intervals - namely, 'post1', 'post2' and 'post3'*

From a social perspective, the initial surge likely included exploratory usage – women testing the newly available free transport to just break free from the daily norms that restrict their mobility. Lakshmi, a passenger interviewed by ThePrint in October 2023<sup>7</sup>, asserted,

*“All the tensions related to home have gone. I feel relaxed, jolly even! All in all, I am happy...the rides are free, that is why we came, otherwise we would not have come. We would not have seen so many temples.”*

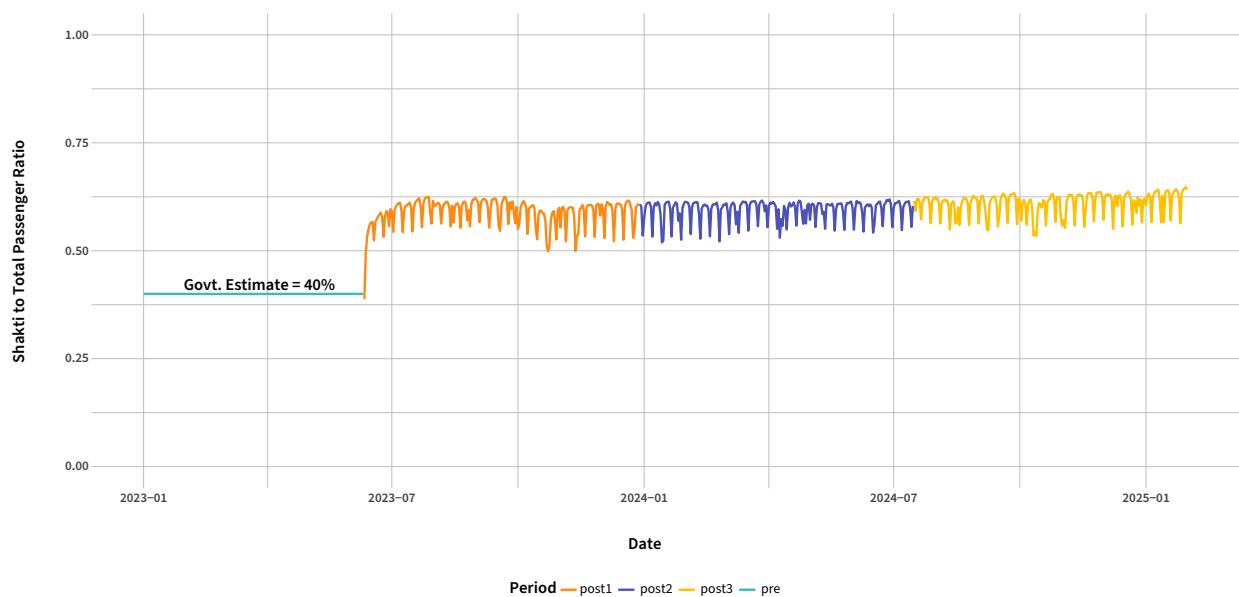
Thus, the initial acceptance of the scheme may reflect women for whom Shakti need not present an economic opportunity per se, but rather presents an opportunity for liberation. Once initial enthusiasm and curiosity fades away, commuters settle into more predictable and habitual usage patterns, aligning closely with established daily needs such as work, education, and essential travel.

This is consistent with the findings of Litman (2004): commuters initially react strongly to fare reductions or free transit services, then gradually adjust their commuting habits as convenience, reliability, and other practical factors become more significant. Litman particularly emphasises initial trial periods followed by stabilised usage patterns as people adapt and optimise their commuting behaviour, a phenomenon we observe in the Shakti scheme as well.

Thirdly, capacity constraints within the BMTC infrastructure itself likely contributed to the observed stabilisation. Rapid increases in demand following the implementation of the scheme typically expose infrastructure limitations, especially in a city as densely populated and spatially extended as Bengaluru. While the scheme effectively removed price barriers, infrastructural barriers such as overcrowding, frequency of services, route coverage, and last-mile connectivity could have become more pressing as footfall per fleet increased. Over time, commuters facing inconvenience or inefficiencies due to these

7. <https://theprint.in/ground-reports/backpackers-in-saris-karnataka-women-are-on-free-bus-ride-to-distant-palaces-temples-tv-shoots/1787155/>

issues might have moderated their ridership frequency, and possibly a relatively well-off section of the passengers (men or women) substituted bus rides with other alternatives.



**Figure 3: Shakti passenger ratio over time**

*Note: In this analysis, we divide the entire period into four parts. All days before the launch of the Shakti scheme is coded as 'pre', and all days after the Shakti scheme launch (till January 2025) is divided in three equal intervals - namely, 'post1', 'post2' and 'post3'*

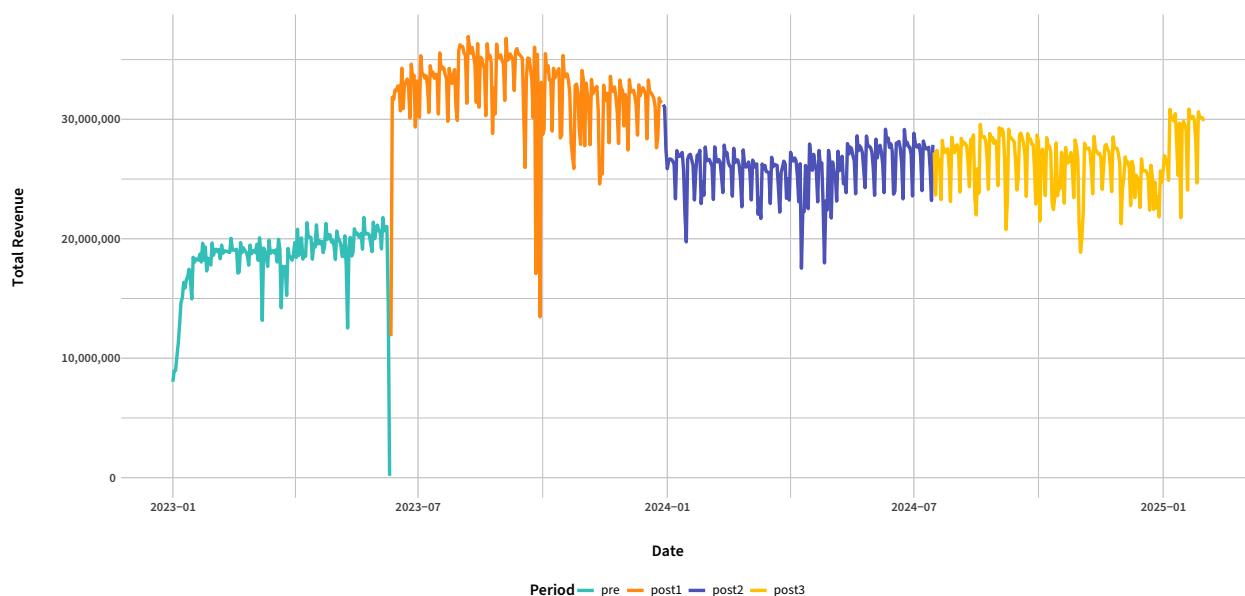
While Figure 2 illustrates the decline in the overall number of passengers after the initial surge, Figure 3 illustrates how the ratio of Shakti to non-Shakti passengers has been relatively stable across all periods. The different colours represent the six-month windows following the scheme's implementation while the flat line (fixed at 40 percent), reflects the estimated percentage of women passengers before the scheme was implemented (as per BMTC officials). While the estimate of pre-Shakti usage is likely speculative due to restrictions of the pre-implementation data – it sets an essential policy reference for expected scheme uptake.

Such a persistent stable ratio post implementation suggests that women commuters now represent a reliable, core user group for public transport – a pattern unlikely to be altered by seasonal variations or external shocks<sup>8</sup>. From a socio-economic perspective, such a stable ratio is evidence that women have embedded the scheme into their daily routines, fundamentally altering mobility patterns, employment accessibility, and broader urban participation. Even when faced with declining overall transit attractiveness or challenges (such as congestion or service frequency), the core beneficiaries, that is,

8. Moreover, as overall ridership declines due to external pressures, the consistent presence of Shakti riders highlights the scheme's role as a stabilising factor for overall transit system revenues and usage. It reinforces the argument made by existing research such as by Cervero (2013), which emphasises that targeted interventions can become anchors of stability for urban transit networks, especially in cities facing volatile commuting patterns or infrastructural challenges. In fact, from a policymaker's perspective, the stability of the ratio offers critical budgetary and operational advantages. Predictability in passenger demographics will allow BMTC and the Government of Karnataka (GoK) to plan their subsidy budgets, resource allocation, and operational strategies more efficiently and accurately. Given that the financial sustainability of public transportation hinges significantly on predictability and stable demand patterns (Gwilliam, 2008), maintaining a steady ratio ensures better fiscal management.

women passengers, have maintained usage, suggesting that the scheme has effectively supported women’s sustained participation in broader life.

Figure 4 plots daily total revenue reported by BMTC bus depots, where “revenue” is understood in an extended sense – including both fare payments from non-Shakti passengers and the government subsidy that compensates for free rides offered under the Shakti scheme. Each point in the graph represents the total daily inflow of money on that specific date, whether from riders themselves or from the state. The pre-scheme period is denoted in light blue, while the subsequent post-scheme period is divided into three six-month windows (orange, dark blue, yellow), just as in the ridership graphs earlier.



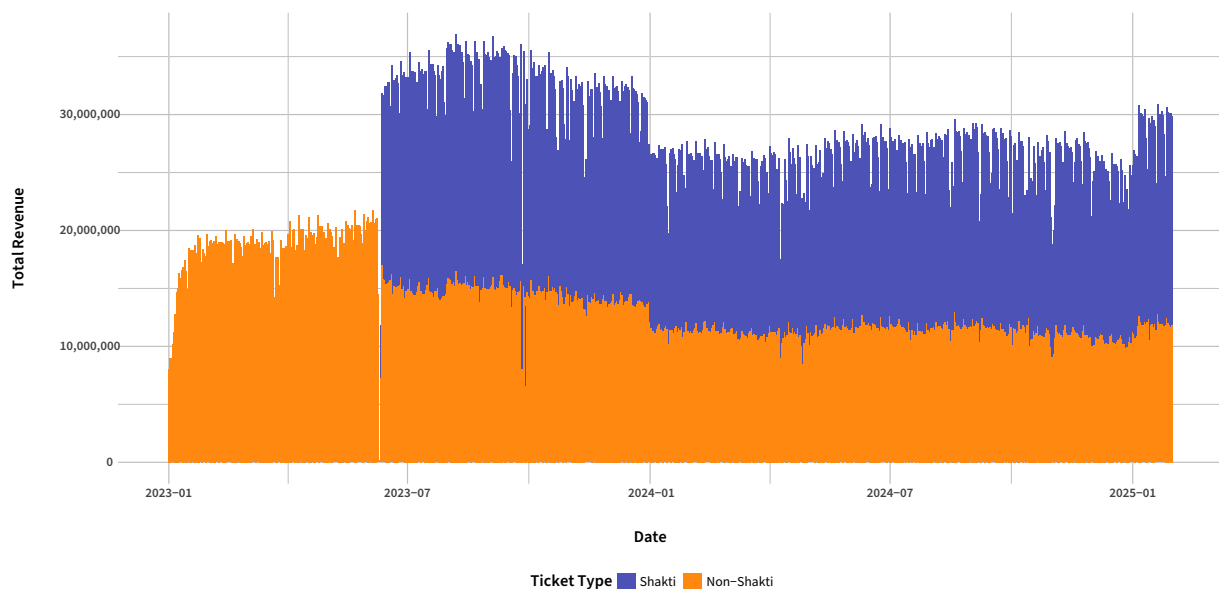
**Figure 4: Daily total revenue trends before and after Shakti**

*Note: We follow the same periodisation as in figures 2 and 3*

The patterns in the graph are not surprising, given the earlier discussion on ridership trends. The revenue line, much like the ridership line in Figure 2, jumps sharply on the day of implementation and remains elevated across all post-scheme windows. This is expected and, in many ways, mechanical: if the number of riders increases significantly and each Shakti rider is associated with a fixed per-trip subsidy, total revenue will increase proportionally. The sharp upward jump immediately following the scheme’s launch confirms that this link between ridership and revenue is working as it should.

What is instructive about this figure, however, is not just the jump but the consistency of the patterns when compared with the ridership trends presented in Figures 1, 2 and 3. For example, the absolute number of riders stabilises in later months (as seen in Figure 3), the revenue line too reflects this stabilisation – confirming that the per-trip subsidy remains roughly uniform. Figure 4, therefore, does not offer an analytical angle but confirms that the structure of the subsidy and revenue is operating in line with expectations set by the ridership trends.

Figure 5 offers a more analytically meaningful picture as it breaks down the daily revenue into two components: the share attributable to non-Shakti riders who pay fares (in orange), and the portion reimbursed via Shakti subsidies (in blue). In effect, the figure shows the composition of daily revenue, and how the balance between public and private financing has shifted since the scheme’s implementation.



**Figure 5: Daily revenue breakdown before and after Shakti**

Immediately after 11 June 2023, the revenue composition underwent an obvious change. What was earlier entirely composed of fare-based payments now became increasingly dependent on government subsidies. The blue portion of the bars slightly dominates the overall length of these bars, indicating that the subsidy component is consistently higher than fare-based revenue on most days.

This slight dominance of the blue (Shakti) component over the orange (non-Shakti) fares invites closer inspection, especially because the difference is far from stark. Indeed, one of the more striking aspects of this figure is how narrow the gap is between the two sources of revenue. For every rupee BMTC receives from a non-Shakti passenger, the state pays only slightly more than one rupee to support women commuters.

This is significant for at least two reasons. First, it speaks to the operational sustainability of the scheme. Subsidies that balloon disproportionately relative to fare revenue often prompt concerns about fiscal unsustainability and have political implications. There is no compelling evidence that this is happening. Further, the per-trip reimbursement appears to be closely indexed to actual usage, with little evidence of leakage.

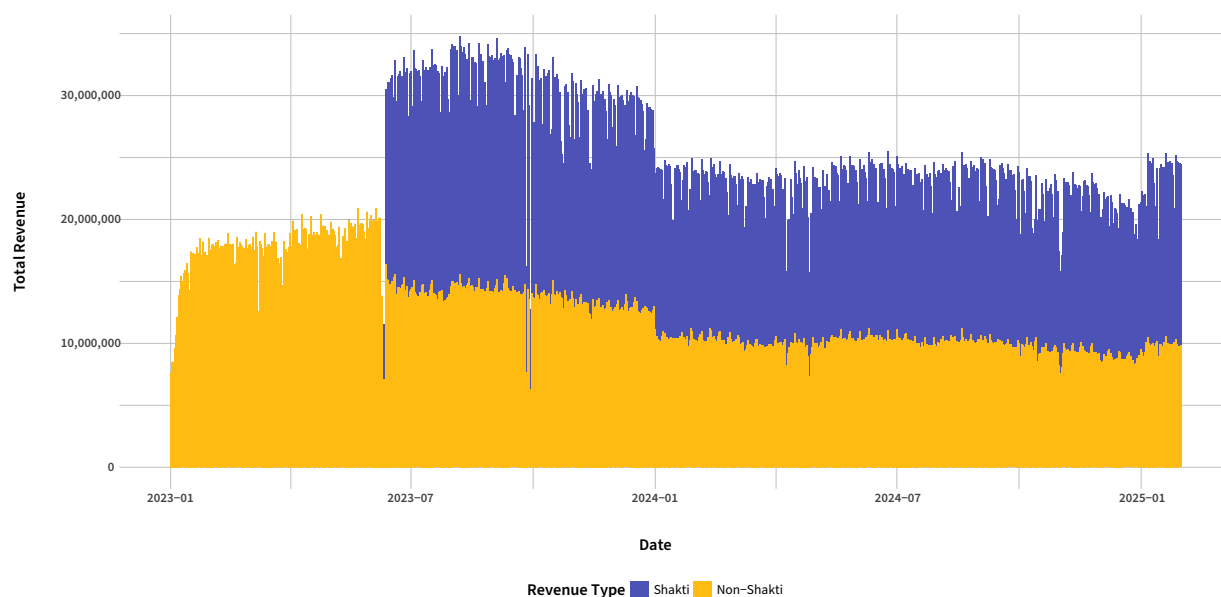
What this suggests is that within Bengaluru, the scheme manages to generate substantial social and economic returns – improved mobility, labour market participation, safety, autonomy – at a cost that is both predictable and moderate.

Figure 5 shows that Shakti passengers have not entirely displaced non-Shakti passengers but rather coexist alongside them in roughly equal proportions. This cohabitation has two implications. This suggests that free ridership has not “crowded out” fare-based ridership, thus avoiding the classic pitfall of free services: overuse by one group at the expense of another. The balance visible in the bars provides indirect evidence that both systems – fare-based and subsidy-based – are working in tandem.

Moreover, it is likely that the social benefits may extend well beyond what the revenue-subsidy ratio implies. Improved mobility can act as a multiplier – enabling women to access jobs, education, health care, and public life more easily. These indirect gains, though harder to measure, can in theory generate

long-term economic and social returns that far exceed the initial subsidy. In that sense, the scheme is not merely a cost to the state, but an investment in mobility-led inclusion, with the potential for compounding benefits across sectors and generations.

Figure 6 provides a critical robustness check on the patterns observed earlier. Unlike Figure 5, which considered aggregate revenues across all routes, this figure focuses exclusively on a subset of “stable” routes – those that have operated continuously for at least 600 days, spanning both 150 days before and 450 days after the implementation of the Shakti scheme. By filtering out distortions arising from newly added or discontinued services, the figure offers a temporally symmetric lens for the revenue analysis.

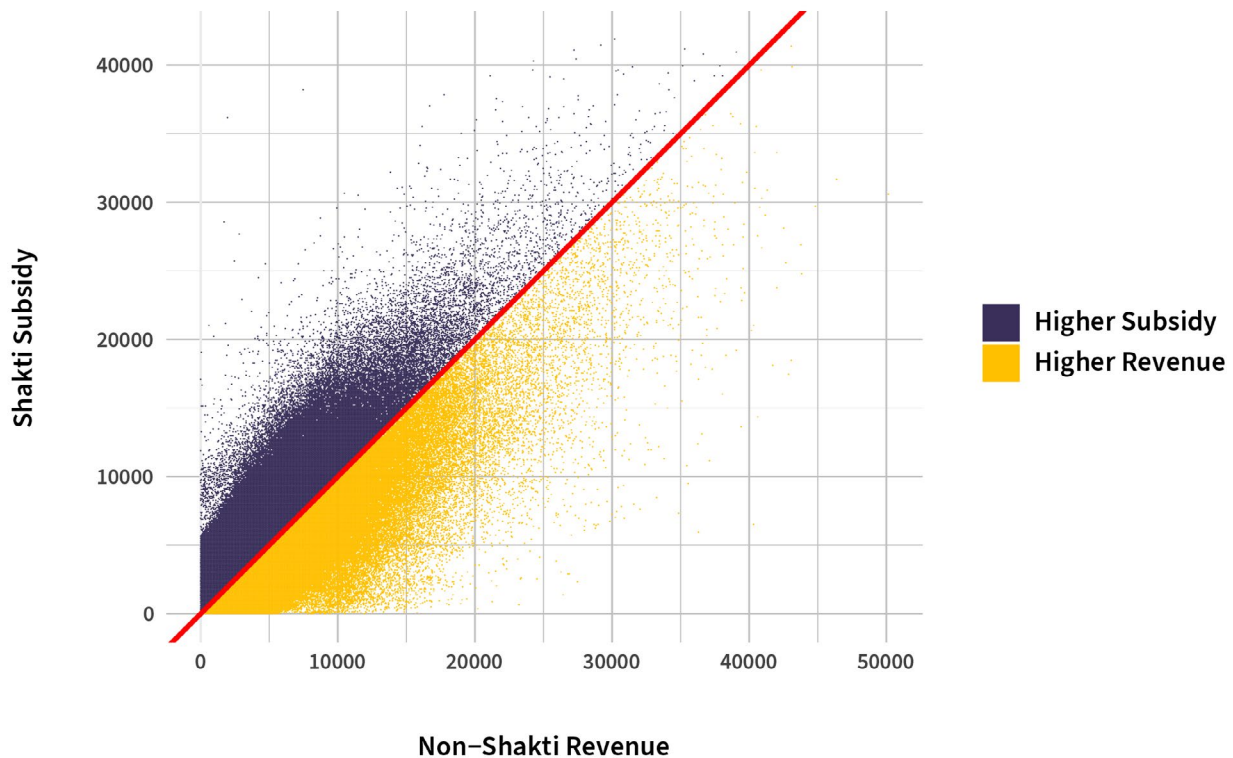


**Figure 6: Comparison of Shakti and non-Shakti revenue (selected routes)**

The striking insight here is how little the overall pattern changes when we restrict attention to this narrower subset. The composition of daily revenues – the relative contributions of Shakti subsidies and fare-paying passengers – mirrors almost exactly what we observed in Figure 5. The subsidy component continues to slightly dominate fare-based revenues, but not overwhelmingly. The coexistence of Shakti and non-Shakti riders persists in roughly the same proportions as in Figure 5, with no evidence of a significant crowding-out effect in these selected routes.

This near-identical result suggests that the findings are not artefacts of route dynamics or selection biases; instead, they reflect a structural, system-wide shift in financing patterns. The stability of non-Shakti revenues across both figures reinforces that free ridership has not displaced paying passengers. In short, Figure 6 demonstrates that even when we remove potential confounders, the story remains unchanged. The Shakti scheme’s impact is neither exaggerated nor localised – it is robust, balanced, and well-aligned with underlying travel demand. The persistence of these patterns across both aggregate as well as stable routes, underscores the reliability of the evidence – the Shakti scheme is expanding access without destabilising revenues.

Figure 7 plots Shakti subsidies against non-Shakti revenue for “paired trips” – trips that are identical in route and frequency, and further, this graph excludes any trips that are exclusively one type (i.e., those with only Shakti or only non-Shakti riders), focussing instead on where both rider categories coexist.



**Figure 7: Shakti vs non-Shakti revenue per trip (For balanced routes)**

Each point in the scatterplot represents one such trip, and the red diagonal line represents the line of similarity. Points that lie on the line, reflect equal amounts of Shakti subsidy and non-Shakti revenue. Points that fall above (or below) the line indicate trips where Shakti subsidy exceeds non-Shakti revenue (or vice versa). The points are colour-coded by density (with blue and yellow denoting higher and lower concentrations) and shaded by category – above or below the line.

What is immediately striking is the approximate symmetry in the scatter. A large cluster of points is concentrated on either side of the line of similarity, and there appears to be no strong skew in favour of either subsidy or fare-based revenue. This means that when one controls for route characteristics and only looks at trips that consistently serve mixed ridership, the total revenue from both components is nearly balanced on average.

Whereas Figure 6 shows routes with high Shakti dominance in total revenue, Figure 7 reveals that when broken down to the unit of trips that contain both groups, the system appears more evenly distributed. This indicates that the difference observed in Figure 6 may be more a function of volume and concentration of ridership by demographic, rather than any inherent design bias or cost asymmetry. Indeed, in subsection 2.3 we will see how such differences may emerge and what the implications of the same could be.

It also underscores a more fundamental point: the subsidy does not appear to be disproportionately surpassing revenue on a per-trip basis. Instead, it is operating at parity with fare-based contributions when observed at the level of mixed-use service, as was evident in Figure 5 as well.

Socially, the balance reflected in Figure 7 has implications for a shared urban experience. On most trips, Shakti and non-Shakti riders appear to move through the system together, neither dominating nor disappearing. This co-ridership supports the broader aim of inclusive urban citizenship – where women do not require separate services, but are instead equally present in shared, public infrastructures.

## 2.2 Two case studies specific to the Shakti scheme

### 2.2a: Study of selected metro feeder routes

In the first case study, we specifically look at the metro feeder routes of BMTC. Specifically, we look at two sets of metro feeder routes. First, we look at the metro-feeder routes that are most dense in terms of ridership. We observe that Jalahalli Cross features consistently on the top 30 metro feeder routes across Bengaluru during the entire two-year period (2023–2025). A closer look at the bus routes reveals that many of these metro feeder routes around Jalahalli are short and link the interior areas to the highway, where key bus stops and metro stations are located. This finding is specifically important given Jalahalli's position within the urban economic geography of Bengaluru. Jalahalli and adjoining areas such as Peenya and Nagasandra have historically been industrial locations with large pockets of residential layouts in the interior parts. Bharat Electronics Limited (BEL) and HMT give the locality its identity. The areas are also home to many garment manufacturers and several pre-university colleges. The Jalahalli, Peenya and Nagasandra metro stations are on a national highway heading towards Tumakuru, while on the other sides, it links to Rajajinagara and Hebbal. The areas constitute a key labour market hub in the city, while also remaining significantly residential.

Further, once we disaggregate the data by Shakti and non-Shakti types of rides, we see a sharp change in women's ridership in these metrofeeder routes especially since 2024. Metro Feeder (MF) routes that cover the areas around Jalahalli and adjacent localities, including Peenya 2nd Stage, Laggere, and Chikka Banavara, have seen about 78 percent rise in average Shakti passenger count in 2024 from a year ago, as opposed to a 29.5 percent decline in average passenger count of non-Shakti users in the same period. This shows that the scheme has increased local women's access to metro stations and, in turn, to other commercial, industrial, and education and leisure hubs in the city.

**Table 1: Average revenue and passenger count for Jalahalli MF routes over time**

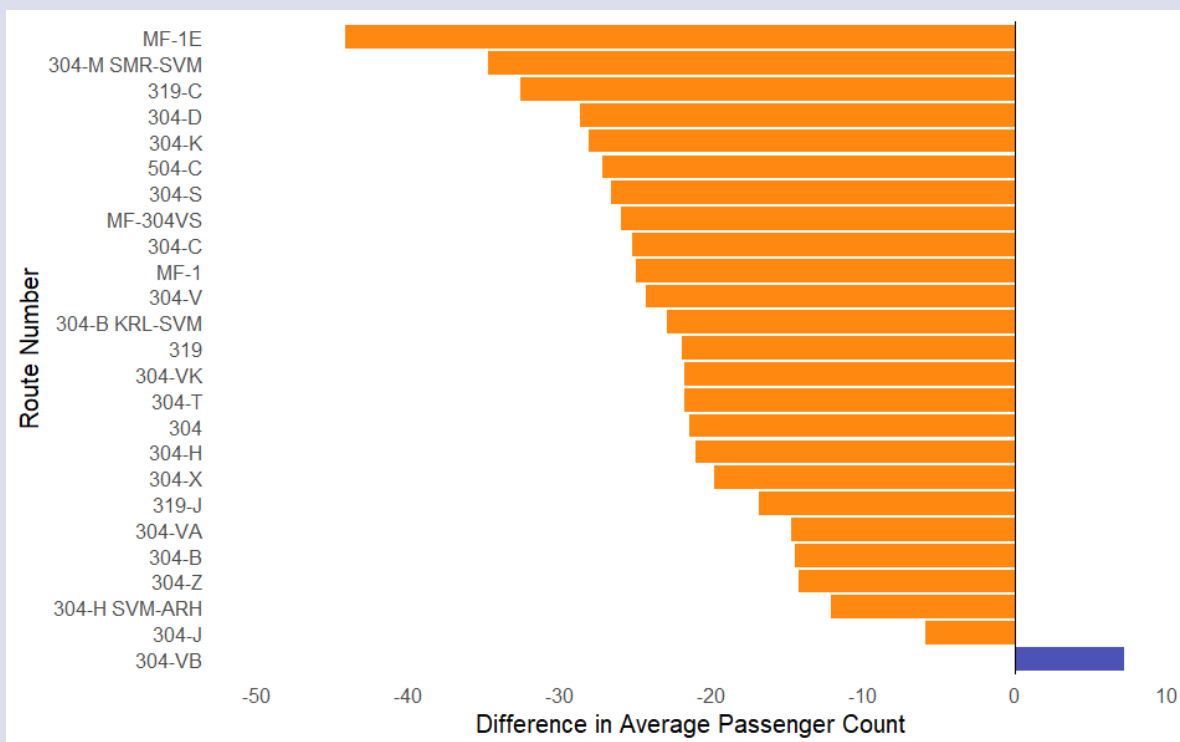
Year	Ticket Type	Average Passenger Count	Average Revenue
2023	Shakti	55,626.68	5,46,719.60
	Non-Shakti	61,293.70	6,80,981.48
2024	Shakti	99,050.31	9,21,393.75
	Non-Shakti	43,195.78	4,62,676.72
2025	Shakti	7,368.81	79,592.19
	Non-Shakti	2,795.31	35,879.44

Second, we study specific metro feeders that ply through routes that cover relatively new metro stations. For example, the K R Puram to Whitefield Purple Line Metro opened to the public on 26 March 2023, while the Benniganahalli metro station, which connects KR Puram to Baiyappanahalli, began operations on 9 October 2023. This completed the Purple Line, connecting Whitefield (Kadugodi) to Challaghatta, via the Nadaprabhu Kempegowda Metro Station, Majestic.

On sectioning the data into two, as before March 26, and after, we observe a drop in bus ridership on average in the period after inauguration of the new stations along the K R Puram to Whitefield (Kadugodi) stretch<sup>9</sup>. We then compare buses which had passed through these station locations even before they were inaugurated, to look at the impact of the free bus rides for women before and after these metro stations were operational.

As revealed in Figure 8, three key metro feeders connected the Whitefield area to the older Purple Line route which ended at Baiyappanahalli : MF – 1, MF – 1E, and MF – 304VS. These three showed a clear drop in average passenger count and revenue after the new metro stations opened. Further, 22 regular bus routes were also analysed in a similar manner. All but one repeated the same pattern. On average, ridership across 25 studied routes fell 25.6 percent after metro line expansion. This clearly shows that there is some degree of substitution from bus to metro, after the Shakti scheme was launched.

9. The metro stations here include K R Puram, Singayyanapalya, Garudacharpalya, Pattandur Agrahara (ITPL), Kadugodi Tree Park, Hopefarm Channasandra, and Whitefield (Kadugodi).



**Figure 1: Bus to Metro substitution along expanded Metro line (K R Puram to Whitefield)**

However, despite this general drop in ridership, some of the observed bus routes have more Shakti users than non-Shakti users, on average. The areas that these bus routes end at/start from, can be segmented into two: K R Market, Majestic Bus Station, and Tin Factory – all notable market areas, including for jobs, versus, Chikka Tirupathi, Kalkunte Agrahara, Dodda Dunnasandra Cross, Dinnur, and Arehalli (key residential and peri-urban localities). This shows that some medium-distance routes that pass through the K R Puram to Whitefield stretch have seen more Shakti uptake, despite a general drop in bus ridership. Further, this is indicative that the substitution to metros has happened more at a non-Shakti level than for Shakti travellers, who could still prefer buses over metros, most likely due to the free cost of travel.

## 2.2b: Shakti scheme uptake in most vs least SC/ST concentration wards

This case study explores the Shakti rider data to understand the level of scheme uptake across wards with high and low SC/ST population concentration (per the 2011 Census). Top two wards with highest SC/ST population, with more than 50 percent of the ward's population belonging to these caste groups, were Lakshmi Devi Nagar and Hebbal, per the 2011 Census data. Shakambari Nagar and Srinagar were observed as wards to study the other end of the spectrum, with recorded SC/ST population below 2.5 percent. This was done to isolate the ridership behaviour of the residents of the respective wards,

closely reflecting the ward's social composition<sup>10</sup>. Across the 4 wards, a total of 47 bus routes were chosen.

Our key finding is that irrespective of the type of wards, every trip for the routes studied had more Shakti passengers than non-Shakti passengers, on average, reflecting a higher Shakti density on buses, irrespective of which ward it was. High concentration wards saw Shakti density at about 93 passengers on average, versus 73 non-Shakti passengers. The low concentration ward had 99 Shakti passengers on average, while the non-Shakti count stood at about 69<sup>11</sup>.

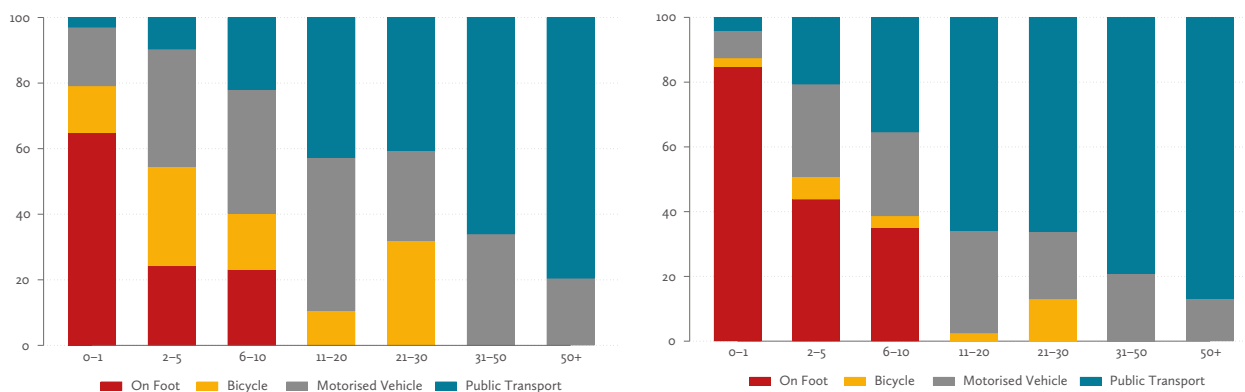
The share of Shakti passengers on a round-trip bus in the high concentration wards was 55.5 percent, versus 56.6 percent in the low concentration wards in the post-Shakti period. However, this difference in the Shakti share between the two socially opposite areas was not statistically significant, even after splitting the post-Shakti duration into three six-month periods. Therefore, we cannot infer that local women in wards with lower SC/ST population benefitted more than women in wards with high concentration.

These two case studies, taken together, suggest the following key findings: First, that metro feeder routes, especially in industrial-residential hubs like Jalahalli and Peenya, saw a sharp rise in Shakti ridership, showing improved access for women to metro connectivity. While overall bus ridership declined after metro expansions, women continued to prefer buses on certain routes, likely due to the free fare under the scheme. Across wards with both high and low SC/ST populations, Shakti usage was consistently high, with no significant difference in uptake.

## 2.3 Public transport and women's employment

Analysing data on mode of transport for non-agricultural workers from census 2011, the State of Working India (SWI) report (2023) presents evidence that public transport plays a more important role in enabling women to access the workplace, as compared to their male counterparts. Figure 4.14b from the State of Working India report is presented in Figure 8 for reference.

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10. For Shakambari Nagar, Banashankari TTMC was also included as a stop, as it lies right outside the ward's boundaries, according to old ward boundary lines drawn by the BBMP. For Lakshmi Devi Nagar, the Goraguntepalya bus stop was included for analysis, as it stood in the vicinity of the ward boundaries, too.
  11. Weighted average was taken to account for the number of trips.

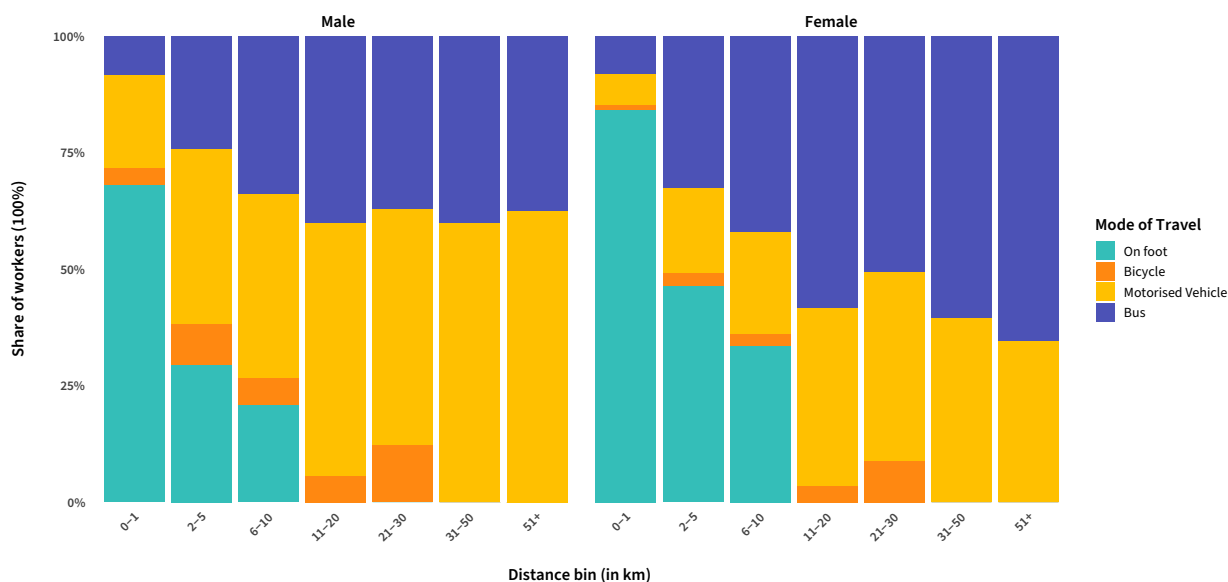


Sources and notes: Population Census 2011

**Figure 8: How do workers travel? Mode of transport for each distance bin in urban India for men (left) and women (right); Credit: Figure 4.14b, State of Working India Report 2023, Azim Premji University**

This shows the share of specific modes of commuting across various distance bins for urban male and female workers across India. Each panel separates the commuting modes by gender and plots them as stacked bars across distance categories (e.g., 0-1 km, 2-5 km, etc.).

Figure 9 replicates the same analysis for Bengaluru Urban, except in this case we explicitly chose “bus” as the mode as opposed to public transport, that is, to exclude train commutes (which in any case is a very low share in the context of Bengaluru Urban). What we find is a strikingly similar pattern for Bengaluru Urban as well.



**Figure 9: Mode of transport by distance to workplace for men (left) and women in Bengaluru (Census, 2011)**

For short-distance travel (0-1 km), walking as a mode dominates for both men and women, more so for women than men. As distances increase, men begin to transition more quickly toward private motorised vehicles and bicycles, while women show a much more gradual and limited shift. For longer distances (10 km and above), the bus becomes the dominant mode for women, even more so than for men. Further,

the Bengaluru-specific graph displays a stronger substitution to bus travel among women across nearly all distance bins including even the mid-distance ranges (5-10 km).

These two graphs help us pose a critical question: how do transport costs, availability, and convenience shape women's ability to participate in the labour force? As the SWI 2023 report notes, women's work participation in India remains stubbornly low, particularly in urban areas, where only 11 percent of working-age women are in paid employment. Among the numerous factors behind this deficit – whether supply side or demand side factors of the labour market, one of the most under-discussed but critical is mobility. Specifically, infrastructure and costs related to daily commuting.

From both these graphs, we observe that for women, walking is the default commuting mode for short distances, while buses dominate at longer distances. But very few women transition to motorised private transport, suggesting both a lack of asset ownership (e.g., scooters, cars) and social constraints around driving or travelling alone. The dependency on walking and buses mean that the affordability and availability of public transport directly shape how far women can travel to work.

What does this imply? Quite simply, if buses are not accessible, safe, or affordable, women stay home – or, at best, accept (more likely) informal work within walking distance. By contrast, if buses are affordable and reliable, they open up an extended radius of employment possibilities. A woman living in an outer Bengaluru locality like Peenya or Bommanahalli might only be able to work in her neighbourhood if walking is her only option – but if she has free, frequent, and safe bus access, she can feasibly reach, for example, the CBD.

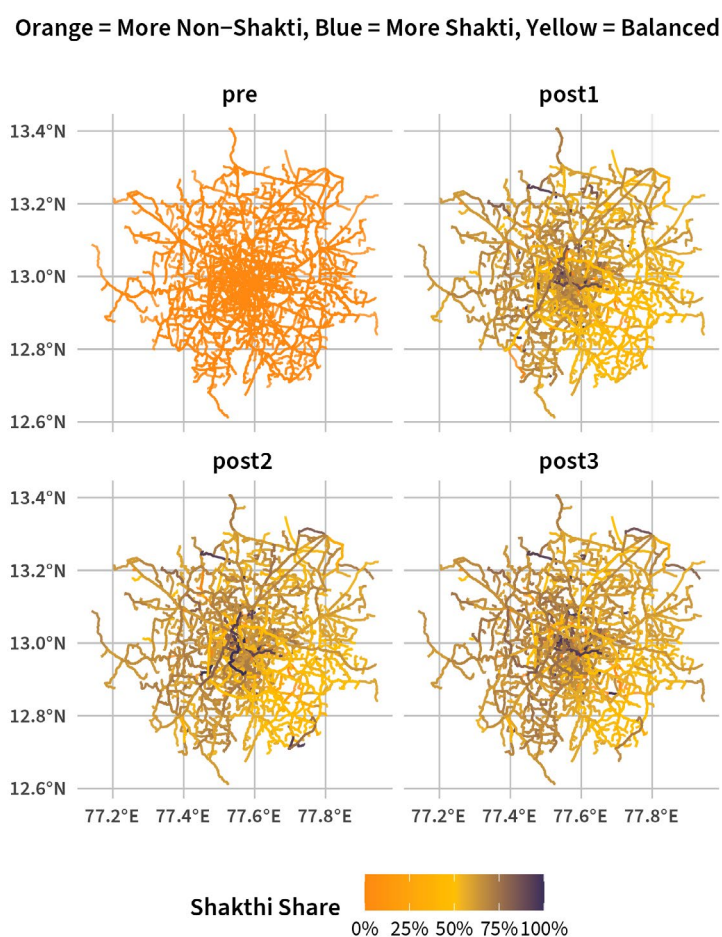
In this sense, transport policy has direct implications for women's employment. When governments subsidise bus travel for women – as with Karnataka's Shakti scheme – that does not merely lead to a reduction in household expenditure but rather lifts various spatial constraints on women's labour force participation.

This is especially clear in the Bengaluru-specific graph, which shows that bus travel is already central to women's work-related commuting in the city. Unlike the national average, where private motorised travel plays a moderate role for both genders, Bengaluru's urban women rely on buses even for medium-range commutes (e.g., 5-10 km, 10-20 km). This suggests that the Shakti scheme may reduce costs for a commuting mode that is already in use by working women in cities, making their routines more sustainable and potentially encouraging new entries into the workforce.

Cost, however, is not the only constraint. Time itself is a scarce resource, particularly for low-income working women who must balance employment with household responsibilities, caregiving, and social obligations. For many such women, walking is not a preference but a compulsion, driven by the need to avoid daily fare expenditure. Given that most women prefer to walk to workplaces that are less than 5 km away (according to both the figures above), this has a significant impact on the possibility of more remunerative wage work. Even if not used for wage work, this extra time can re-orient time-use patterns. The shift from foot to bus transport, enabled by the Shakti scheme, may open up not only new spaces of work but also new configurations of time-use that allow women to reshape their daily lives.

While all the above can generally be argued at a theoretical level, the same becomes difficult to establish empirically. This is because neither the Time Use Surveys (TUS) nor the Periodic Labour Force Surveys (PLFS) in India are representative at a district level. The impact of Shakti scheme in the context of BMTC buses, whether on women’s time-use patterns or on labour force participation, hence, cannot be directly evaluated using secondary data sources. However, a recent study by IWWAGE<sup>12</sup> (2024) hints at a seemingly positive impact on women’s labour force participation since the launch of the scheme.

Figure 10 presents a spatially rich illustration of how different regions of Bengaluru have responded to the Shakti scheme over time. Specifically, it plots route-level variations in the composition of passengers across four time periods: the pre-scheme period (labelled “pre”), and three successive post-implementation periods (labelled “post1,” “post2,” and “post3”). These maps are constructed using the latitude and longitude coordinates of roughly 5000 BMTC routes, sourced through the BMTC mobile app and publicly available GIS datasets.



**Figure 10: Route level passenger share: Shakti vs non-Shakti**

Source: Cleaned BMTC data with route coordinates for 5000+ routes (Primary source: BMTC App, obtained via Github)

Note: We follow the same periodisation as before. All days before the launch of the shakti scheme is coded as 'pre', and all days after the Shakti Scheme launch (till January 2025) is divided in three equal intervals - namely, 'post1', 'post2' and 'post3'

12. <https://iwwage.org/wp-content/uploads/2025/03/IWWAGE-Factsheet-Karnataka.pdf>

Each map represents the BMTC bus network as a dense web of routes overlaid onto Bengaluru's urban geography. The routes are not displayed arbitrarily but are geospatially precise, retaining the true physical locations and orientations as they cut across different city zones. Each line (representing a bus route) is coloured according to the relative share of Shakti (women) passengers to non-Shakti passengers on that route in the given period. The interpretation of the colour codes are as follows: yellow to blue indicates routes where Shakti riders (women) constitute a higher share than non-Shakti riders; orange to yellow hues indicate routes dominated by non-Shakti passengers (men and inter-state migrant women).

The “pre” panel serves primarily as a baseline. Since the Shakti scheme was not in effect before June 2023 and no sex-disaggregated ridership data was available, all routes in this period are shown in orange. The purpose of this frame is not to show distribution, but to establish spatial continuity – the map allows us to compare how the same underlying transport networks evolved in the aftermath of the scheme's implementation.

As we move from “post1” to “post3,” a clear spatial pattern emerges. Across the three post-scheme panels, the network progressively takes on deeper shades of blue, particularly in specific regions – most notably in the city centre, the north-western corridors, and parts of the western suburbs. In contrast, certain peripheral regions – especially to the east and south-east – remain more yellow or even orange, signalling more balanced or male-dominant ridership patterns.

This shift in colour pattern across time is one of the most novel and consequential findings of this study. It reveals that access to the Shakti scheme is not uniform across space. Rather, it exhibits a marked spatial pattern, with some parts of the city consistently showing higher uptake by women, and others lagging.

Perhaps the most compelling visual and analytical finding lies in the transformation of Bengaluru's central corridor. As seen most clearly in the “post2” and “post3” panels, routes cutting through the Central Business District (CBD) – including Majestic, K R Market, Shivajinagar, and adjoining areas – become increasingly saturated with blue and purple tones, signifying routes where Shakti riders form the majority. Another striking feature of the maps is the consistent concentration of blue-dominant routes in the western and north-western parts of the city. Areas like Vijayanagar, Rajajinagar, Yeshwanthapura, and Peenya show strong and persistent Shakti usage, especially along arterial roads that connect them to the CBD.

The CBD is the economic and administrative core of the city with a high concentration of state institutions, major transit hubs, wholesale markets, and commercial enterprises. That the Shakti scheme has facilitated a visible and sustained increase in women's presence on central routes suggests a gendered reorientation of urban spaces, particularly those comprising economic activities.

This pattern may partly be a function of BMTC's long-standing network strength in these zones, but it is also likely to reflect deeper socio-economic dynamics. These areas house significant populations of working-class and lower-middle-income families. Many women in these neighbourhoods engage in domestic work or industrial labour – often located at substantial distances from their homes. The cost of daily commute, even if modest per trip, adds up over time. The Shakti scheme, by removing this

recurring cost, likely unlocked a large pool of demand for safe and reliable transport. The visual shift to deep blue in these zones suggests that these women are not just using the service occasionally – they are becoming regular, core users of the system. Importantly, this is not a temporary spike but a persistent spatial pattern, visible across all three post-scheme periods.

This outcome holds important policy implications. It suggests that universal subsidy schemes can organically produce equity-focused outcomes when underlying demand exists and infrastructure is adequate. In this case, the state did not have to manage regional infrastructure based on the labour market – women in western and northern Bengaluru most likely responded to the opportunity when constraints were lifted.

In contrast, the eastern and south-eastern parts of the city remain largely in yellow or light orange, even in the later post-scheme periods. This is despite the fact that these zones have high population densities, substantial commuting flows, and a large workforce of informal and low-wage women workers. A possible explanation is perhaps not the lack of demand, but a combination of infrastructural and policy design.

Given the somewhat self-sustaining nature of revenue and subsidy patterns in the Shakti scheme, it may be useful to extend the policy for migrant women. Once again, one has to look beyond the binaries of immediate cost and benefit for expanding the scheme. Extending the scheme to migrant women would be a signal of inclusive urban citizenship, one that recognises the city's dependence on migrant labour. Furthermore, from a fiscal perspective, the addition of these women is unlikely to disrupt the stable Shakti-to-non-Shakti revenue ratios observed city-wide. These riders would, in many cases, substitute foot travel for short bus commutes – thus broadening the ridership base without displacing paying passengers commuting longer distances.

While our results do not reflect a causal evaluation due to data limitations, we can certainly claim that at the very least, the Shakti scheme has redrawn the city's map in a gendered sense – making central, commercial, and formal zones accessible to women in new and sustained ways. Women are not just travelling more – they are travelling into the heart of the city – areas that claim visibility, access, and spatial rights that were previously limited. In a social and political sense, this is nothing short of claiming equal citizenship. In an economic sense, it signals a gendered reorientation of the urban space itself and its economic geographies.

## CHAPTER 3:

# Conclusion

Karnataka's Shakti scheme is a welfare policy that changes how women relate to mobility. Our findings suggest that by making bus travel free for resident women, Karnataka has not only expanded access to economic and social opportunity but also altered the spatial dynamics of Bengaluru. Core routes through the CBD now reflect a more gender-inclusive ridership. Unlike a cash transfer scheme, it has targeted a particular demographic and provided an in-kind benefit that is being widely used. The initial spike in usage has tapered but still reflects high ridership – suggesting that the policy has successfully altered medium term behaviour in a self-targeted manner.

To sustain the positive impacts of the Shakti scheme, three areas require immediate policy attention. First, Shakti's success now rests heavily on the capacity of the public transport system to absorb and sustain the rise in demand. Overcrowding, low service frequency, and an ageing fleet risk turning the promise of access into an experience of delay and discomfort. Informal conversations with administrators suggest that they have not been able to adequately deal with infrastructural stress. Without significant investment in BMTC's capacity—through fleet expansion, improved maintenance, and tighter coordination with metro and feeder networks—the scheme's impact will plateau.

Second, the promise of universal access is undermined by weak last-mile connectivity in large parts of the city. Here, the problem is not affordability but availability. Without targeted improvements in last-mile infrastructure—such as mini-bus services, well-lit pedestrian pathways, and better integration with other modes—women in these regions remain effectively excluded from the mobility gains the scheme enables.

Finally, one ethical imperative should be to expand to include interstate migrant women, who are currently excluded on domicile grounds. Such women form a significant share of the city's working poor, live and work in some of the most poorly connected areas of Bengaluru and remain structurally dependent on walking or informal transit. Their exclusion not only weakens the inclusive intent of the scheme but also overlooks its potential productivity benefits. Extending the scheme to migrant women could yield welfare gains that offset subsidy costs for reasons that we already explained in several parts of this report. By shifting from walking to bus travel, a typical working migrant woman can translate her saved time into additional work hours or reconfigure their time-use in a manner that improves aggregate welfare. Shakti extension for migrant women would not be a new entitlement so much as recognition of universal access to public goods for vulnerable populations.

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