

An Urban Data Policy Tool for Closing Gender Gaps

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Context

The Udaiti Foundation has prioritised improving women's work participation through better access to jobs, improving enterprise scaling, and advocating for better gender-smart infrastructure or enablers of women's access to quality work opportunities - safety, mobility, time, housing, digital, assets & finance. While there are several known market challenges to rural women's access to quality work opportunities, the urban work participation of Indian women is surprisingly low by any standard. In 2021-22, PLFS reported the labour force participation rate for women in urban India at 17.5 % while the same number lies at 57.9 % for men in urban India. This number for working women has barely increased in recent years (and has actually fallen from 18.5% in 2019-20), as displayed below.

Despite girls' educational enrolment increasing over the past two decades and rapidly declining fertility levels, we don't see a youth bulge in female labour force participation (FLFP). A survey by the Centre for Monitoring Indian Economy (CMIE) in 2021 found that the labour force participation rate of women in urban areas was lower than that of women in rural areas, also reporting that marriage and family

Figure 1. Female Labour Force Participation in Urban India by Year



Visual 1. Barriers to Urban Women's Work Participation



responsibilities were significant barriers to the employment of women in urban areas. In accordance with this finding, ILO's report in 2021 found that the negative impacts of marriage and children on women's employment was greater in urban than rural areas, and that this was partly due to factors of high living cost and longer commutes, and greater demand for formal sector jobs in urban areas. However, despite greater demand for formal sector jobs, urban India continues to be largely informal as well- with 78.4% of employed women engaged in informal employment in urban India in 2018.¹

There are a host of barriers that contribute to the low participation of urban women in the workforce in India. These barriers are systemic, and social norms are an overarching contributor to each of them. There have been efforts to address some of these (as detailed in subsequent paragraphs), but many persist in some shape or form. Some of these are captured in the above visual, and detailed below:

- » **Safety:** Safety emerges as a key concern for both women in urban settings, and their families. Recent survey data across urban India indicates a concern over women's safety while travelling. In 2021, an online survey across metropolitan areas indicated that almost 56% of the women who used public transport reported being sexually harassed, while another study found that only 9% of urban Indian women feel safe in public transport². Additionally, the same study also reported that women in urban areas are more likely to use public transport (59%) than men (51%), while men are more likely to use personal vehicles, making the safety of public transport an urgent call for concern. A survey conducted by the Thomas Reuters Foundation in 2018 found that 95% of women in Delhi, felt unsafe in public spaces, and 84% of women in Mumbai, another major city, reported experiencing sexual harassment in public spaces. A survey by Saftipin, a mobile application that tracks safety in public spaces, reported that women rated public transport safety in Delhi at a 2.6 out of 5. Borker (2021) highlights the trade-off that women face between safety and opting for jobs or education in her study, finding that women students are willing to choose

¹ WIEGO, Informal Workers in India [report](#)

² OLA Mobility Institute research

a college that is in the bottom half of the quality distribution over a college in the top 20% for a route that is perceived to be safer, and this willingness to pay for safety translates to a 17% decline in the present discounted value of their post-college salaries, along with an additional expense of INR 17,500 (USD 250) per year and an additional 27 minutes of daily travel time to travel by a route that is one SD safer³. The rising concerns over safety in urban spaces is further backed by data from the National Crime Records Bureau (NCRB) who reported a 28% rise in cases of crimes against women on public transport in urban areas (from 3,059 in 2018 to 3,926 in 2019).

- » **Mobility:** Mobility challenges come hand in hand with those associated with safety. A survey that looked at the 2019 round of Time Use Survey (TUS) (with a sample size of about 84,207 women and 88,914 men) calculated the mobility rate in urban India (% of respondents reporting at least one trip in a day made outside their homes) finding that about 47% female respondents reported to have stepped out of their homes at least once in a day⁴. When women do leave their homes, they often combine several errands in multiple short trips – called trip chaining - and end up paying more for their daily travel. This is often known as the ‘pink tax’ that women pay for ease of mobility in urban areas. A 2019 survey in Delhi showed that while women’s trips were almost 38% shorter on average than their male counterparts, men’s average travel costs were 35% less than women’s. Another mobility issue is that public transport, designed with the male commuter in mind, is infrequent at off-peak hours when women make the most trips. As a result, they often end up using informal modes of transport such as auto rickshaws, although these modes are more expensive.
- » **Care Burden & Infrastructure:** Indian women spend 9.8 times more time than men on unpaid domestic chores and 4.5 hours a day caring for children, elders and the sick⁵ a total of 9.6 times the amount men spend on care work in urban areas. Further, during the pandemic, their share of unpaid care work grew by nearly 30%. Some 43% of urban, female solo entrepreneurs also reported a loss of productivity due to domestic work⁶. The TUS study highlighted in the mobility section above also found that as the time spent on doing household chores increases, the percentage of women stepping out also decreases, with 76% women reporting a trip outside home on a day if they spent no time doing domestic activities, but only 31% of women reporting the same if they spent more than 5 hours doing daily unpaid labour at home. As a result of invisibilizing unpaid work, India fails to capture Indian women’s work in totality, leading to their participation in the Indian economy being seen as minimal. It also creates a very binary definition of what constitutes ‘labour’. As an unintended consequence of the above, government policies may focus more on increasing paid work avenues, as opposed to also alleviating unpaid work burdens, thereby making unpaid domestic & care work a key barrier preventing female participation in the labour force in India.
- » **Informal nature of work:** Over 82% of Indian women per PLFS 20-21 are engaged either in self-employment or as casual labourers (i.e. not regularly employed for salary or wages), falling into the informal sector, with many working in home-based work and domestic work. These workers generally do not have access to social security coverage and decent working conditions, nor written job contracts, and deal with a disproportionate amount of uncertainty and vulnerability, and makes the work participation even more precarious.
- » **Housing:** As per the urban female labour force participation rate, there are 25M employed

³ [Borker: Safety First: Perceived Risk of Street Harassment and Educational Choices of Women](#)

⁴ [The Print: Burdened by domestic work, nearly 50% of India’s urban women don’t step out even once a day](#)

⁵ [UN Women](#)

⁶ [Women Entrepreneurs: COVID Impact India](#)

women in urban India, and nearly ~80% of working women believe that there is a need for a greater number of hostels in urban areas & particularly in the cities⁷. In 50 years, the Government has created 900 hostels at an avg of ~18 hostels per year, but given the number of urban working women, the demand is not being met. Furthermore, there are ~3500 Industrial clusters, and these industries have huge potential for women workforce participation in the coming years. One of the significant hurdles women face in gaining access to remunerative employment outside of agriculture is lack of access to jobs near one's home. Providing safe and affordable housing solutions to women would help them to engage in employment opportunities especially in non-traditional sectors.

- » **Lack of Assets:** If women owned land or houses in urban areas, housing might not be as significant a challenge. However, while NFHS 5 found that 43.3% of women respondents reported owning a house/land alone or jointly⁸ (38.3% in urban areas), it has to be noted that NFHS data here isn't necessarily the most reliable, and in contrast, a 2020 University of Manchester working paper examined other Indian surveys and found "barely 16% of women in rural landowning households own land, constituting only 14% of all landowners owning 11% of the land." Major questions arise regarding how much land women hold, and the nature of ownership (family or individual). Without sex-specific data for these, estimates drawn up using different methodologies can be misleading, as women's land rights scholar Bina Agarwal said in a recent paper.
- » **Public Toilets:** There is limited data on public toilet coverage by population of men and women; 90% women feel restrooms in public spaces lack cleanliness & hygiene; 55% public toilets not usable due to unhygienic facilities in Delhi NCR⁹. Small scale efforts like the crowdsourcing app called WooLoo are aiming to fill the gap.
- » **Digital Access & Usage:** The GSMA Report (2022) reported a significant jump from 2019 to 2020 in smartphone ownership and usage when market conditions and COVID-related lockdowns helped provide justification for women to obtain smartphones and use mobile internet, but in the past year there has been no growth in the proportion of women using mobile internet and almost no growth in smartphone ownership. In a similar vein, Singh and Joshi (2020) found that 35% of women surveyed in Bihar do not own a smartphone, implying that any mobility focused ICT intervention such as real time information of public transport, QR code payments will need to cater to basic phones and smartphones¹⁰. Social norms and societal constraints play their own role in restricting women's phone ownership and usage. Barboni et al. (2021) examine this in their study that looks at the effect of the SKY program (cell phone distribution to women) in Chhattisgarh, finding that while phone distribution led to a liberalisation of norms, supervised use continued to be thought of as more appropriate than unsupervised use, regardless of marital status (for unsupervised use of mobile phones, the numbers moved from approx. 15-18% for unmarried women, and 22-26% for married women. For supervised use of mobile phones, the numbers moved from approx. 58-75% for unmarried women, and 78-86% for married women¹¹.)

Given the nature of the roles played by women in economies, families & communities, they engage with and experience cities differently. In the face of these barriers, including unreliable public transport systems, unsafe streets and public facilities (e.g. toilets, lack of housing) securing educational

⁷ Bain

⁸ NFHS 5

⁹ Ibid

¹⁰ [Singh & Joshi: Women's Safety and Mobility in Urban Bihar: A Case for Investment](#)

¹¹ [Barboni et al: Does access liberalise gender norms around phone use for rural women?](#)

opportunities and jobs away from their homes becomes a challenge.¹² Women retreat to lower-return local opportunities, either in terms of educational/skilling choices or home-based self-employment or work predominantly in the informal sector (almost 90% of working women are in the formal sector (IMF 2018), making up a large share of the 385 million informal workers in the country¹³). With a majority of public infrastructure tailored to men and the formal sector, meeting women's needs is becoming an increasing priority to meet the sustainable development goal of gender equity.⁴

Toward this, we seek to build on the rich experience of building safe cities and smart cities across India. We believe there is adequate infrastructure, financing, and policies (e.g. economic zones for job creation, some efforts toward improving safe & cost-effective commute between home and work such as transport services, she-taxis and buses and free metro passes for women) in larger cities like Delhi as well as smaller ones like Aerus SEZ Belgaum¹⁴ and with schemes such as Atal Jyothi Yojana, a national scheme to ensure solar street lighting across approximately ten states in the country) along with other key building blocks. Similar building blocks are in place across the country along with clear intent. What is missing are designs informed by segment and place-specific data and insights with a gender perspective.

¹² ITDP Report, 2013

¹³ India Spend

¹⁴ PWC: Evaluating impact of SEZs in India through sectoral analysis and case studies

Project Objectives & Approach



Source: PTI Photo¹⁵

This Project focuses on:

- (a) Harmonising the building blocks toward impact through using increasingly available data and emerging technologies and
- (b) co-creating democratised decision tools with citizens & crowdsourcing data & inspiring solutions.

This involves leveraging secondary & primary data to improve building blocks of women's urban participation: a big data exercise on gender, mobility & economic participation of women probing/pressure testing some of the connections we know between them. The hope is to bring together data on geo-tagged infrastructure, women's work participation, crimes, urban agglomeration, economic zones and metadata from remote sensing, IOT, digital data, POS service delivery that can be proxies for some of the above; all contributing to aiding women's mobility, and improving the building blocks of women's urban participation.

Key preparatory activities include brainstorming and co-creating the scope; designing a collaborative, bringing the technical thinking, data options, and potential geographies; and consolidating partnerships:

- 1) Bringing together administrative data on geo-tagged public infrastructure and secondary data on women's work participation, crimes, urban agglomeration, and economic zones to analyse the relationship between existing urban infrastructure and women's empowerment.
- 2) Layering metadata from remote sensing, IOT, crowd-sourced digital data from safety apps and platforms, POS service delivery for a more disaggregated picture of women's mobility.
- 3) These data indicators will serve as proxies for place-specific gender, mobility & economic participation of women to create a public rating of 'ease of women's mobility' across cities.
- 4) Work with tech platforms and/or industry bodies to integrate safety features onto existing travel and navigation apps (e.g. Google Maps and DMRC apps) which could be used in offline mode. Illustrative features that could be included in local vernaculars could incorporate crowdsourcing

¹⁵ [PTI Photo](#)

public safety related infrastructure such as street lights, public transport, or helping identify blind spots, (i.e no lighting, sparsely populated, no public facilities), the nearest One Stop Center or police station (which may have an all women police car), to facilitate a safer travel for users

- 5) Create technology tools (for instance, messages and applications on mobile devices or websites) for either reporting, requesting immediate assistance, or generating knowledge (on trains, metros etc.)
- 6) Conduct rigorous impact evaluation of new tools/safety features and existing infrastructure on women's mobility and overall economic empowerment in terms of education and labour market choices.

Proposed Scope & Outputs

The scope is two-pronged:

- A full visual output for the country or selected states based on existing data and
- A more in-depth evidence to action approach with a city for driving policy action, gap closing, and evidence building.

Outputs include:

1. A **public data tool** in partnership with local governments to support policy /decision making on infrastructure provision and public spending
2. Partnering with private/public mobility app providers to **layer safety and mobility data onto existing solutions**, enabling women users to access information about safety and service provision across the city
3. Advocacy through bringing together stakeholders from across the WEE ecosystem for **convenings** looking at how to improve women's access to work opportunities.
4. **Impact evaluation studies and policy briefs** to understand and analyse the effects of public infrastructure on women's mobility and empowerment.

Workplan & Phases

The Udaiti Foundation envisions the initiative taking place in a phased approach. Phase I is detailed below, with phases 2 and 3 outlined in brief.

Phase I

- The Udaiti Foundation has worked with Farzana Afridi as a technical co-lead with Yamini Atmavilas on a **literature review** highlighting barriers to women's mobility, along with existing best practices.
- An exhaustive list of relevant **urban data variables and sources** will be built
- A **landscaping of existing safety/gender infrastructure initiatives** in the target cities to identify what works for women. Monitoring and evaluation efforts of these existing initiatives will subsequently commence.
- An **approach note** on the exercise including a review of data sources & their assessment (quality, availability, relevance, unit etc.), and a literature review & framework for analysis
- A list of **potential target cities to implement the initiative** will be identified, with current options being Noida, New Delhi, Bangalore, Chennai, Indore and Bhubaneshwar.

Gender-oriented urban transport initiatives are operational/announced in Tamil Nadu, Delhi, Karnataka, Kerala, Punjab, Assam and Maharashtra. We propose selecting our target cities from this sample.

- Udaiti is **convening a platform of partners** who are interested in this program. Additional potential partners will also be identified and engaged, including Artha Global, Chennai Lab, Urban Catalysts, Ola Mobility Institute.

Phase 2

This phase will look at building the **proof of concept** for the urban big data tool and the visual output. The data exercise above will serve as a baseline and built into a dashboard. We could consider a Gender Nudge Unit at the city level w/ the police or municipal corporation that can act as (a) a harmonizer and (b) a catalyst for action. In addition to building the big data tool, if we can raise resources, we will carry out a desk review with chosen cities to understand inclusion and accessibility parameters (Project “Who does the city belong to?”). This would include scoping exercises of the city, across conventional and new parameters such as accessibility, availability of women’s toilets, availability of care infrastructure (creches), travel journeys of women commuters, and so on. We can also help cities access MP/MLA funds and/or Nirbhaya Funds to close gaps.

Phase 3

Phase 3 will focus on incorporating and institutionalising the proof of concept as part of a planning tool available for public consumption and for key decision makers. The goal will be for the tool to be utilised in urban planning cycles.

- (A) **Sandboxing to mainstream safety into citizen mobility apps:** Work with tech platforms and/or industry bodies to integrate safety features on existing travel and navigation apps (like Google Maps and DMRC apps) which could be used in offline mode. We could partner w/ Nasscom Foundation to do some sandboxing on promising designs/ solutions and crowd in innovators around the idea.

Illustrative features that could be included in local vernaculars include the following indicative list:

1. Crowdsourcing public safety related infrastructure such e.g. street lights, public transport, or helping identify blind spots, (i.e no lighting, sparsely populated, no public facilities), or the nearest One Stop Center or police station (which may have an all women police car), to facilitate a safer travel for users, on Google maps or other transport/navigation apps like DMRC.
2. Create technology tools (for instance, messages and applications on mobile devices or websites) for either reporting, requesting immediate assistance, or generating knowledge (on trains, metros etc).

- (B) **Advocacy** is an important element of this project; we will aim to continually put out briefs and data outputs that will be strategically disseminated with influential public and private stakeholders. Multiple rounds of campaign nudges in partnership with private sector can be used to accelerate improvements on key parameters.