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Gender Mainstreaming in Urban Infrastructure

A Position Paper

This Position paper on '*Gender Mainstreaming in Urban Infrastructure*' is part of the Capacity Building for Low Carbon and Climate Resilient City Development in India CapaCities project.



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Introduction

India is projected to add 300 million new urban residents by 2050 and it will need to address the challenge of accommodating the needs of the growing population, UN Habitat's first 'World Cities Report 2016 - Urbanisation and Development: Emerging Futures' report has stated. As per the Ministry of Urban Development's Handbook of Urban Statistics, the level of urbanization in the country as a whole increased from 25.7% in 1991 to 27.82% in 2001 and to 31.14% in 2011. Sex ratio in urban India declined from 894 in 1991 to 900 (females per thousand male) in 2001 and showed an improvement to 929 in 2011.

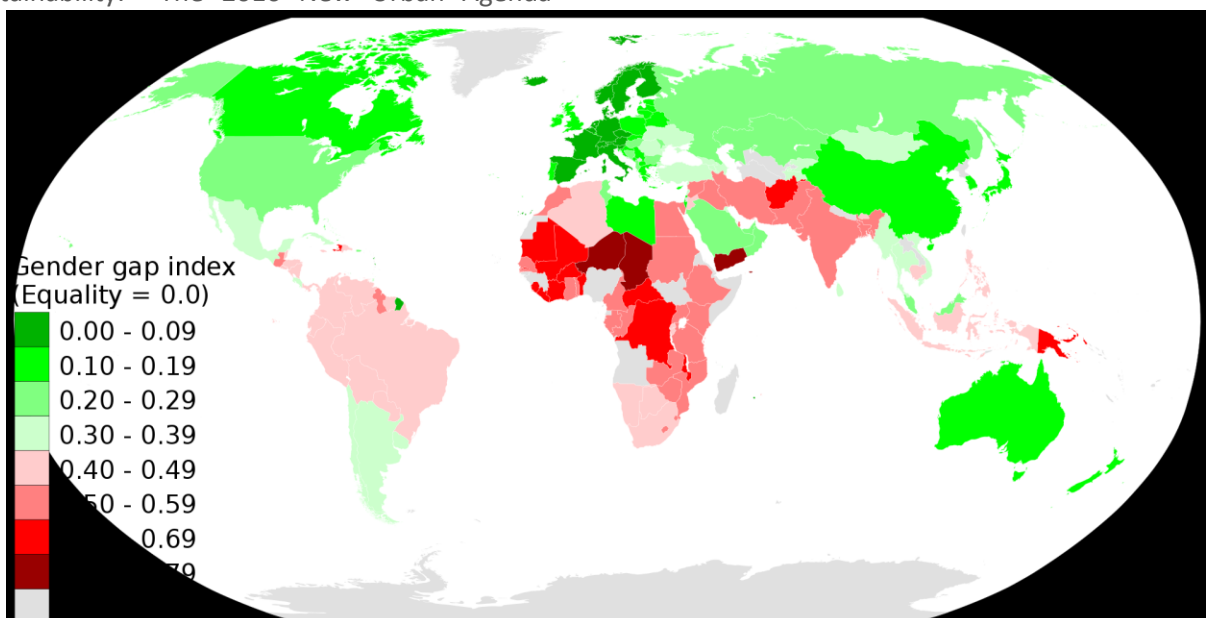
In 2015, the Government of India launched the Smart Cities Mission with the aim of developing 100 cities all over the country making them citizen friendly and sustainable. The five-year Mission recognizes that 40% of India's population will be residing in urban areas by 2030 contributing to 75% of the country's GDP.

In 2013 during the annual Commission on the Status of Women meeting, a convening of the highest global normative body on women's rights, the United Nations recognized that street harassment prevents equality and thus social sustainability. The 2016 New Urban Agenda

defines the 17 Sustainable Development Goals (SDG's) of which Goals 5 and 11 discuss this aspect. SDG 5 states achieving gender equality and empowering women and girls. SDG 11 defines making cities and human settlements inclusive, safe, resilient and sustainable.

The Gender Development Index of 2016, in the Human Development Report written by the United Nations Development Program groups India in the last group (5) rating it at 0.819 falling considerably behind Ghana and Bhutan at 0.899 and 0.900 respectively.

India's National Policy for Women 2016 formulated by the Ministry of Women and Child Development states '*Creating a conducive socio-cultural, economic and political environment to enable women enjoy de jure and de facto fundamental rights and realize their full potential; Mainstreaming gender in all-round development processes/programmes/projects/actions; and Strengthening monitoring, evaluation, audit and data systems to bridge gender gaps*' as some of its objectives. The Smart Cities Mission too states '*safety and security of citizens, particularly women, children and the elderly*', as one of it's core elements.



Source: https://upload.wikimedia.org/wikipedia/commons/thumb/7/71/Gender_Inequality_Index.svg/2000px-Gender_Inequality_Index.svg.png

Current Scenario

So far urban infrastructure has been gender-neutral i.e. catering to all irrespective of gender. A gender neutral planning approach tends to favor males compromising on the specific needs of females and transgender. This results in limiting their access to resources, mainly education and work opportunities thereby prohibiting them from achieving their full potential. The restriction to access is on the account of inconvenience and out of concerns for one’s own safety during the commute.

Mobility too is experienced differently by women and men, as they use different modes of transport for different purposes and in different ways depending on their socially determined reproductive, productive and community-related gender roles. These differences need to be well understood in order to inform the design of gender-inclusive transport projects.¹

Gender has largely been considered to mean Male and Female, however, the presence of a third gender

– the transgender is now recognized. In April 2014, the Supreme Court of India declared transgender to be a ‘third gender’ in Indian law.

The 2011 Census of India for the first time collected data on the third gender and declared their total population to be around 4.88 Lakh. The highest proportion of the third gender population, about 28%, was identified in Uttar Pradesh followed by 9% in Andhra Pradesh, 8% each in Maharashtra and Bihar, over 6% in both Madhya Pradesh and West Bengal and well over 4% in Tamil Nadu, Karnataka and Odisha.²

For the purpose of this paper, the discussion is presented for females but the argument holds valid for both these genders.

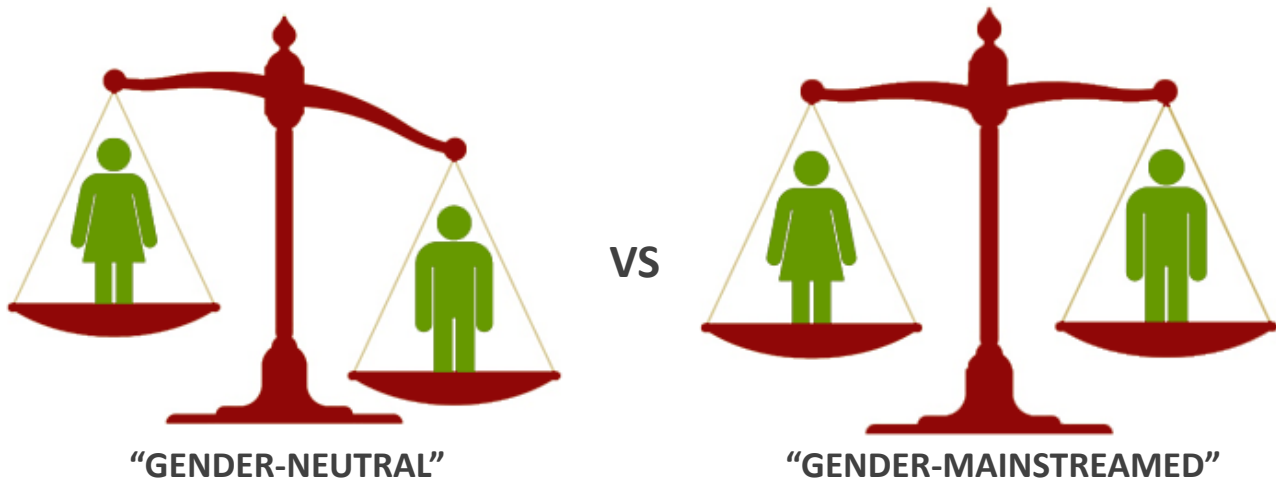
What is Gender Mainstreaming?

In 1997, United Nations Economic and Social Council (ECOSOC) defined Gender Mainstreaming as: *“The process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetrated. The ultimate goal is to achieve gender equality”*.

Gender mainstreaming was mandated by the 1995 Beijing Platform for Action as a strategic Approach for

achieving gender equality and women’s empowerment at all levels of development.³ It entails incorporating the specific needs of each gender into the urban framework for equitable provision.

Gender discrimination issues range from violence and sexual harassment in public and private spaces to the inaccessibility or non-existence of educational and job opportunities, land ownership, public spaces, political voice and health and financial services. To address these critical concerns, gender mainstreaming must be introduced into all aspects of city life.⁴



Gender mainstreaming entails recognizing that there are differences which make each gender unique. These differences are mainly due to the Biological differences and due to the difference in the nature of Activities performed by each.

Differences due to Biological Reasons

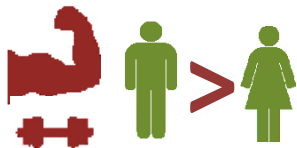
The three genders are different biologically, especially females who experience menstruation and pregnancy. This difference affects their capability to perform even the most basic tasks. For example, the standard walking radius considered while planning is 500m. While this is suitable for an average-build middle aged male, for a pregnant woman it is least walkable.



Women are Biological different.



The average height of women is shorter than men.



Men are physically stronger than women.



The comfortable walking distance for Men and Women is different.

Also, on an average, women are shorter than men in height and have lesser physical strength. When designing vehicles, with regard to these physical differences; step height, seating design, positioning of push belts and grab rails are not paid attention to.⁵ There are organizations like the Azad Foundation which provides training to women to become bus drivers and improve their economic condition. However, it was realized that after the completion of the training many women who were short in height had trouble driving the buses due to the high height of the driver's seat. The difference in the average height of men and women isn't taken into account.



Photo credit: Sarath KT (Centre for Urban Equity)



Differences due to different Activity Patterns

There is a difference in the nature of social roles and responsibilities that females (are expected to) perform. Males mainly interact with the public realm for work, education and recreation. Females on the other hand interact to perform various caretaking and household tasks along with other responsibilities irrespective of them being a homemaker or employed. As a result of this difference, their pattern of movement is very different from males. Due to the tasks they perform, women tend to trip-chain i.e. they perform multiple tasks in one go making various stops at short distances. But the transport planning is done based on average ‘peak hour’ travel patterns of men who make single long-distance trips. However, this trip chaining nature of activity makes the traditional fixed-route bus services impractical, forcing them to rely on more expensive and slower door-to-door services (either private cars or auto-rickshaws, bikes).¹²

Females are also often accompanied with children and elderly. Incase of an illness in the family, a females routine and movement is most affected. A lot of females from the poorer sections of the society are engaged in informal employment activities as construction labourers, vendors, domestic help, rag pickers etc.¹³

Also their interaction with the public realm is governed by a specific purpose of which recreation is a very small percentage. In their book, *Why Loiter*,

the authors point out how women need to ‘demonstrate a purpose’ to be out in the public and how they must navigate various restrictions when they wish to access this space ‘just to have some fun’. The idea that females would step out for recreation is still largely unaccepted and used as an argument for blaming them in the event of reported sexual abuse. This is a common discussion irrespective of whether the abuse is in the form of cat-calling or of a more serious nature like rape. The fact that females make trips for a specific purpose further increases the need for gender mainstreaming in infrastructure provision.



Women tend to Trip-chain to perform various tasks.



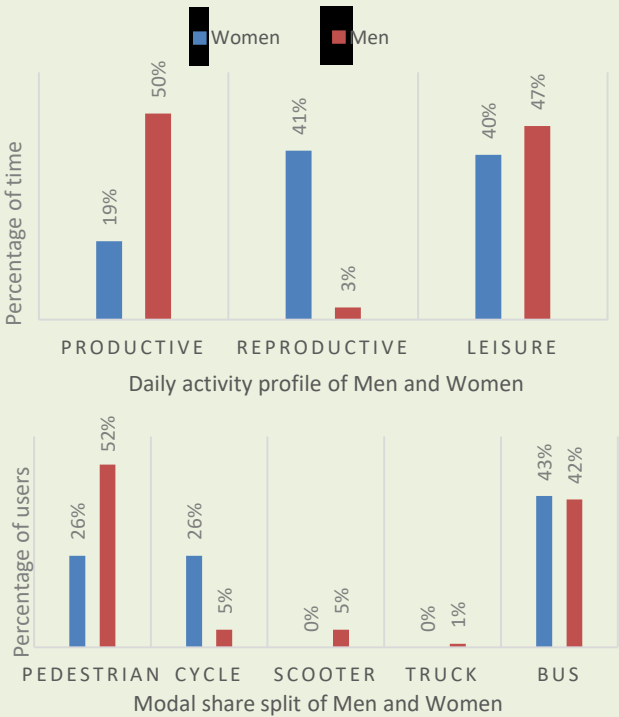
Men tend to make longer direct trip to work and back.

A diary of a typical workday was recorded for both men and women at Sanjay Camp and their daily activities were categorized as productive, reproductive and leisure (including sleeping, bathing, etc.) activities. The load of reproductive work for women is very high, reducing their leisure time and the time they can spare for productive activities.

The modes of transport used maximally for access to work are walking (33%) and public buses (42%). 21% of the people use bicycles to commute to work. Two wheelers are used by 3% of the commuters comprising exclusively of men.

Women prefer to find work within shorter distances due to limited access to transport facilities. 75% of the women work within a 5-km radius, which is significantly different from 75% of men working within 12 km from their homes. Also, since women cannot afford expensive mode of transport, their access to opportunities is further limited.

The study concluded that compared to men, women’s journey governed by inferior modes of travel, multiple purposes and time-poverty is defined by anxiety.



Source: A Gendered Perspective of the Shelter– Transport– Livelihood Link: The Case of Poor Women in Delhi, Anvita Anand and Geetam Tiwari

Consequences of Gender-Neutral Infrastructural Planning

Sexual Harassment

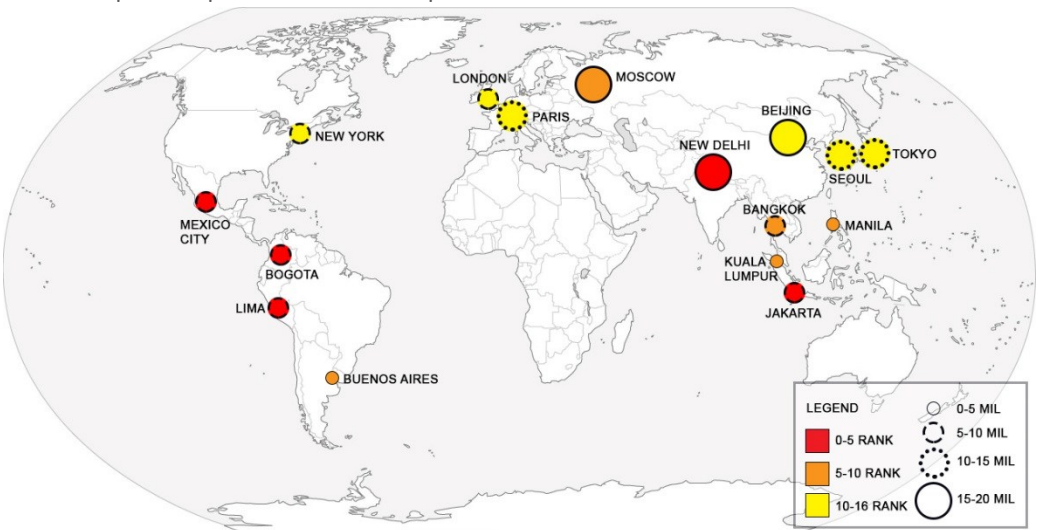
Each task that has to be performed requires one to move from one point to another in the public realm. This movement can happen through public or private modes of travel. Along with issues of time-poverty and affordability, safety is the most important factor for females to access and use a public space. The international research study has identified that, if speed and frequency are the most important factors for men to utilize public transportation system, for females, safety is the most important factor. METRAC, Canada based safe committee says that, *‘when places are made safe for women, they are made safe for everyone’*.

Females face different forms of harassment in the public spaces from verbal harassment and cat-calls to sexual assault and rape. This phenomenon is rampant

in both developed and developing countries.

The map indicates the safety rankings of 15 of the world’s largest capital cities and New York City, based on the survey conducted by Thomson Reuters Foundation in partnership with Yougov.com.¹⁴ Bogotá, Colombia was found to be the most unsafe with Delhi, India ranking fourth.

Even though different in their population sizes and geographical location, the cities of Bogota, Mexico, Lima Delhi and Jakarta are termed as the most unsafe cities and similarly, Paris, London, Beijing, New York, Tokyo and Seoul even though put in the same bracket of safety level, show no correlation in population sizes of the agglomerations.



Map indicating the Safety rankings and Population of 16 international cities.

Women in Cities International conducted surveys in four cities – Rosario, Argentina; Delhi, India; Petrozavodsk, Russia; and Dar-es-Salaam, Tanzania.¹⁵ In all these cities, women identified their gender as the main factor contributing to lack of safety. (75% of street survey respondents in Dar-es-Salaam, 89% in Delhi, 76% in Petrozavodsk and 89% in Rosario).

In all cities, public transport was also mentioned as unsafe and/or not inclusive for women. In the Focus Group Discussions, participants repeatedly named public transport vehicles and places designated for waiting for public transport as unsafe. Many participants made recommendations for improving the safety and inclusiveness of public transport service. In street surveys, also, respondents in every

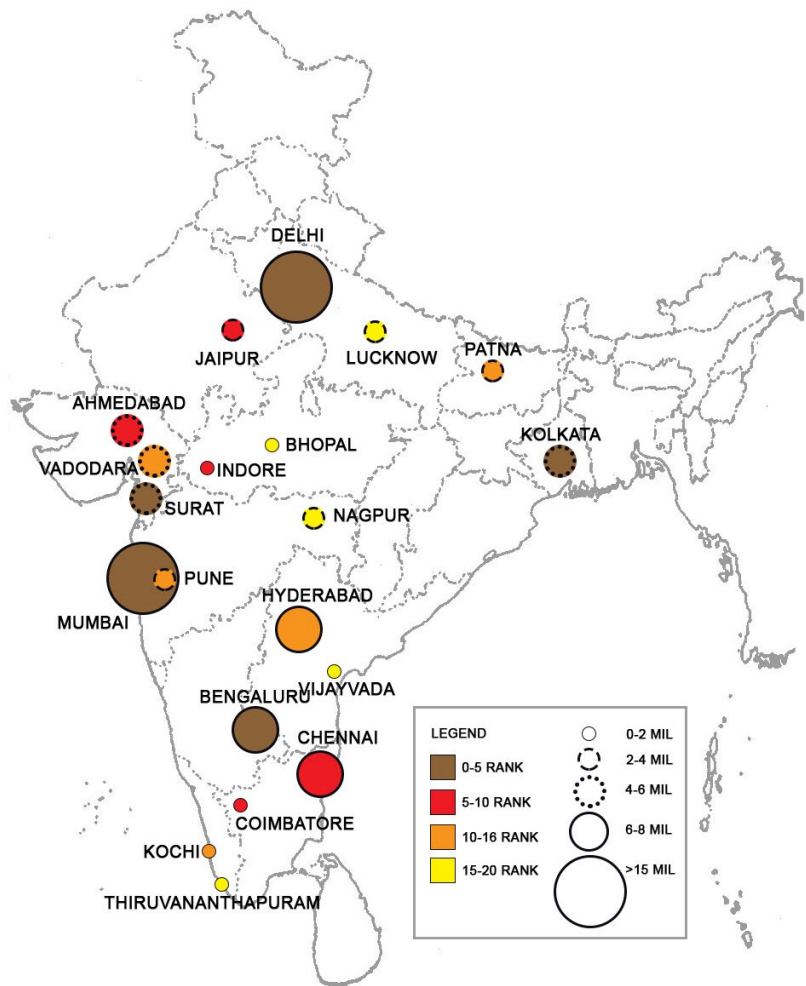
city named public transport vehicles or public transport waiting areas as a common place where sexual harassment/sexual assault occurred. Considering that equal access to transport is a key determinant in the mobility of women and girls as they engage in city life, this is a particularly regrettable situation. This indicates that gender inclusion and women’s safety should be a priority issue for both transport planners and for transport drivers and conductors. It was also highlighted that walking is not necessarily a safer alternative.

Among survey respondents in all four cities, the roadside was reported as a common, if not the most common, place where sexual harassment and/or assault was experienced.

Crime in India

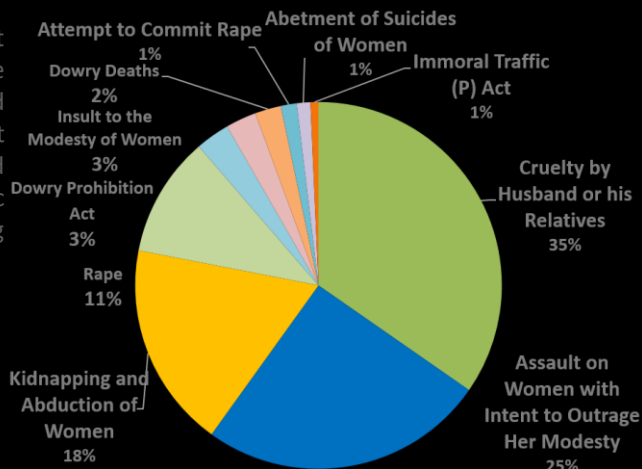
The National Crime Bureau Record’s data for 2015 shows that the top six Indian cities with highest rates of crime against women are Jodhpur, Delhi, Gwalior, Bhopal, Nagpur, and Durg-Bhilainagar.

These ratings indicate that the problem of sexual harassment in public spaces is rampant irrespective of the size and population of the city.



Map indicating the Indian cities that have been recorded as having the highest 20 crime rates in the country according to the National Crime Bureau’s record data for 2013.

The figure shows that 48.3% of crimes against women like Attempt to commit Rape, Insult to the Modesty of a Woman, Rape, Kidnapping and Abduction of women, Assault on women with Intent to Outrage her Modesty, Immoral Traffic Act and Abetment of Suicides of Women occur in the public arena reinstating the need for gender mainstreaming our infrastructure.



Source: Crime in India 2015, NCRB
The figure shows the percentage distribution of crime in India IN 2015

Normalization of sexual harassment has resulted in very less action to end it. Not just men, but even women in many parts of the world have internalized and accepted it. The idea that sexual harassment in any form is 'unacceptable' has still not gained importance. Most incidents of harassment are not reported due to fear of shame or of not being taken

40% Women face harassment on a regular basis.

88% were harassed while using public transport.

100% Drivers and conductors said women harassment is not prevalent in Bhopal.

30% believe that women were equally responsible for it.

The analysis of the existing infrastructure revealed that 96% of the bus shelters were poorly lit and not easily visible in the night. Around 50% of the bus stops along standard routes did not have a bus shelter.

Vulnerability: The fear for one's own safety restricts their mobility costing them their growth and peace of mind. In 1992, British Crime Survey confirmed that women restrict their movements far more than men do.

The various issues and fears that women face on an everyday basis in the public realm, not only restricts their growth but also results in various impacts – Environmental, Social, Economic and psychological, on the society and the city as a whole.



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how safe is your neighbourhood?

[Got Harassed? Share your Story](#)
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Psychological Impact

Studies have consistently demonstrated that women tend to have a greater fear of crime than men. Several explanations have been provided for women's higher fear levels. One is that women tend to see risk more often than men and have greater sensitivity to risk in their environments because of their greater physical and social vulnerability.¹⁸

Psychological research suggests that fear is related to unpredictability and lack of control of exposure to potential crime. Unfamiliar strangers behaving in an unusual way are particularly likely to trigger distrust and fear.¹⁹ This fear of strangers is not known to men and their movement is not governed by constantly having to look over their shoulders. Other research examines male and female differences in fear of crime explains that women tend to underreport actual victimisation in surveys and therefore women's higher levels of fear appear to be 'irrational'.²⁰ This sets a vicious circle in place exaggerating the sense of fear and shame, adding to their sense of being vulnerable.

Various research studies have shown that, an unsafe situation or crime encountered by a user would create great psychological fear resulting in reduced/no usage of PT system at all. Fear of crime is now widely recognized as a barrier to public transport use. For example, research in the UK has identified that an additional 10.5 percent of rail trips would be generated if people felt more secure when traveling and waiting at stations.²¹ A majority of car drivers in inner Los Angeles claimed they would use transit if public buses were perceived as safe and clean. Also, few studies have shown that, experiences shared by the victim to other users would create psychological impact of fear and would reduce ridership at a greater level.

People who know somebody who has been a victim exhibit far higher levels of fear and anxiety, suggesting a sense of "victimization through hearsay". The media has also been identified as over-emphasising the relative risk of travel on public transport.²² In today's time with the increased use of Social Media it is not only easier to share such experiences on Facebook and Twitter, it leads to propagation of fear to a certain extent.

With the increased use of smartphones and phones with camera, a new form of harassment is taking place where in videos of women are recorded and then easily circulated through internet. In May 2017, a man was caught making a video of a female passenger sitting in front of him in the metro train. The girl realized what he was doing and recorded him in the act itself and shared it on Facebook.

Delhi NCR saw incidents like the abduction of Snapdeal employee Dipti Sarna as she was on her way home in the evening using the shared auto; and the two cases of murder of women outside the metro station during the peak morning hours as they were on their way to work. In all these cases, the victims were being stalked during their daily commute to work.

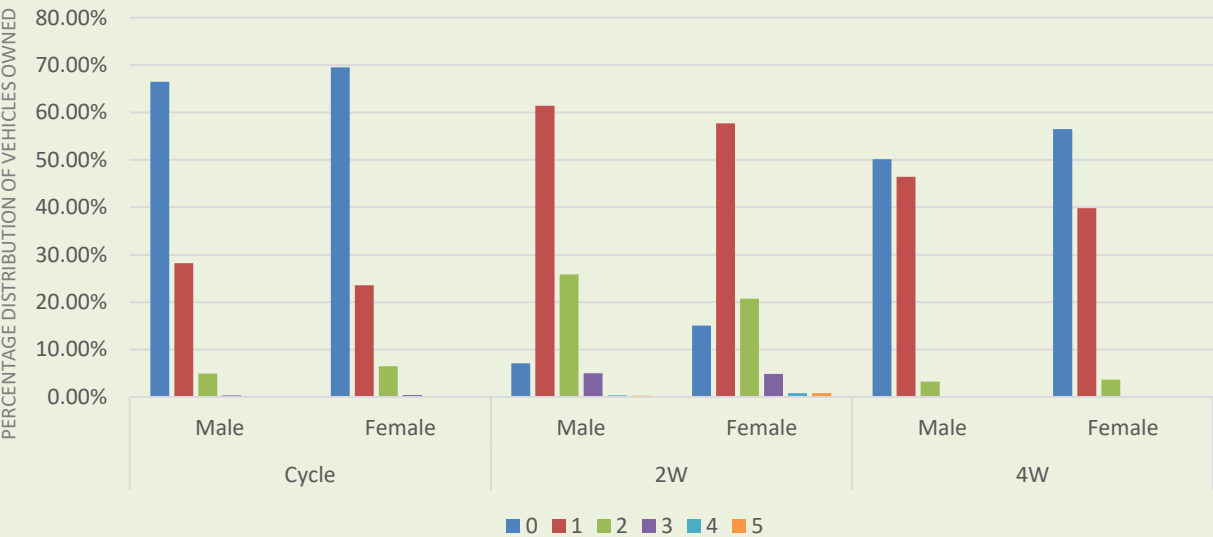
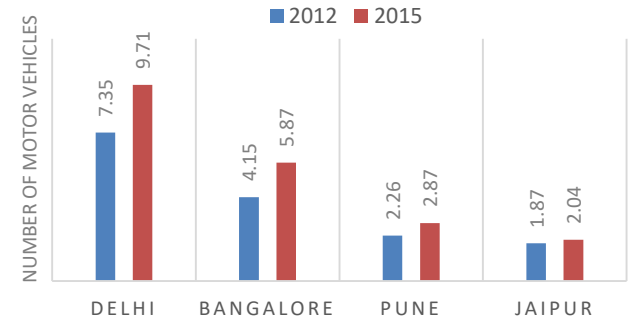
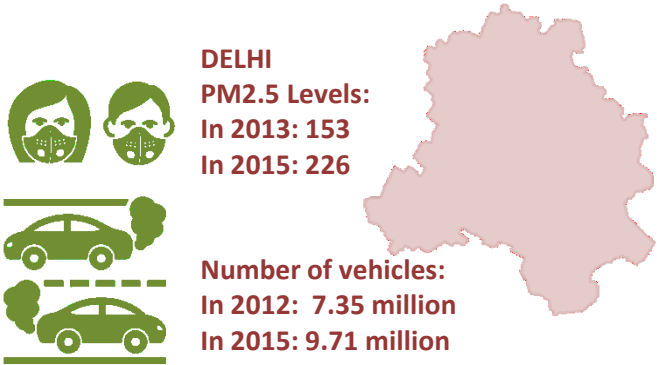


Environmental Impact

Women tend to walk and cycle more than men to reach to their destinations. However, in the absence of public transport and in cases where the public transport facility is unsafe, woman are forced to shift to private modes. This is possible for a few rich women who can afford to. For a large percentage of women this option is not available.

Shift from public to private modes of transport has a great impact on the environment as it increases the number of vehicles on the roads and contributes to global warming, urban heat island effect and air pollution.

The trends of increase in number of motor vehicles in millions of 4 Indian cities Delhi, Bangalore, Pune and Jaipur are shown in the graph.²³ The increase in pollution levels in Delhi in the two years indicates how the increase in motor vehicles on the roads have caused an increase in PM2.5 levels.²⁴ This is true for all cities that witness a rise in number of private vehicles.



A study conducted by iTrans in Pune indicates that more women own bicycles compared to men. The ownership patters shown below indicate that most women use a two-wheeler for their daily commute. While a two-wheeler gives the much needed freedom to a woman and does not add much to the traffic congestion, it does tend to affect the environment adversely.

The coming of Taxi services like Ola and Uber has proven to be a boon to Indian women as they provide safe and reliable transport as good as their private vehicles. The rape of a young woman by an Uber driver while on her way back home late at night raised many safety concerns when using these cab services. As a reaction to the incident the services were banned in Delhi. However, it was realised that while there are safety issues, these services too provide independence and flexibility especially to working women.

As Manu Joseph states, “Uber is a greater friend of urban women in India than the government ever was.” India’s best-known economics writer, Swaminathan Anklesaria Aiyar, also states that Uber “is a company that does not have a moral compass, but it does serve the society.”²⁵ These services act as a public transport for women, especially with their car pooling options which reduce the cost of travel, makes the rider feel safe while travelling and helps reduce the carbon emissions and congestion.

Economic Impact

The absence of safe and affordable public transportation facilities restrict a woman’s access to education and employment. Women from working class restrict their job opportunities or stop working, and girls are often forced to quit their studies. The agitation by nearly 90 students from Rohtak’s Rewari tehsil for the upgradation of their school to senior secondary level is one such example. The girls had to travel 3 km to a senior secondary school in a nearby village and faced harassment and molestation along the way.

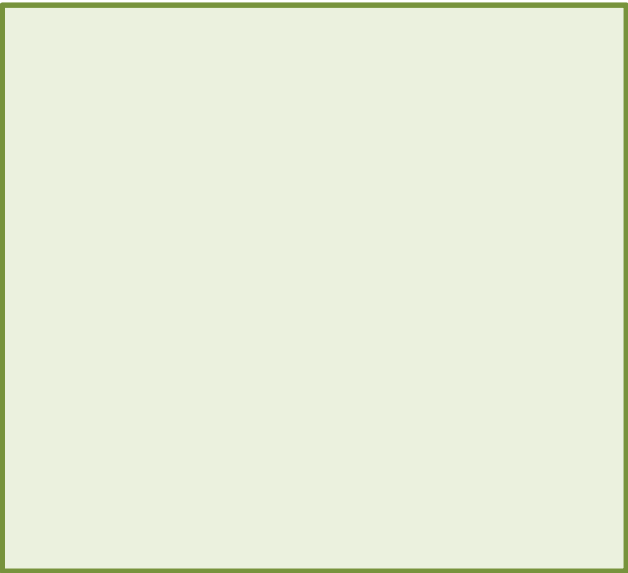
Worldwide, women’s labor force participation is lower than that of men. Moreover, women often work in the informal economy and are more likely to be unpaid for their work or face significant wage gaps.²⁶ Among employed women, 85 percent engage in vulnerable employment, including around two-thirds who work in the agricultural sector.

A recent report, *Women, Work and the Economy*, published by the International Monetary Fund, highlights that shrinking the gender gap in education and the Female Labour Force Participation Rate (FLFPR) has the potential to boost India’s per capita income significantly by 2030. The report stated that if the gender gap were to be halved by 2017 and cut to one-fourth of its 2008 value in 2027, then India’s per capita income could be 10 to 13 percent higher than under the baseline scenario of unchanged gender inequality in 2020 and 2030, respectively. The FLFPR in India is low and concentrated in rural areas and the agricultural sector. Moreover, the FLFPR has been declining over the last 20 years.

A study by the McKinsey Global Institute, *The Power Of Parity: Advancing Women’s Equality In India*, states that India has one of the world’s largest gender gaps when it comes to labour force participation, with women accounting for 23-24% of the total labour force and generating a mere 17% of the share of country’s Gross Domestic Product (GDP). The study further states that India can increase its 2025 GDP, estimated at \$4.83 trillion, by between 16% and 60% simply by enabling women to participate in the economy on par with men.²⁷

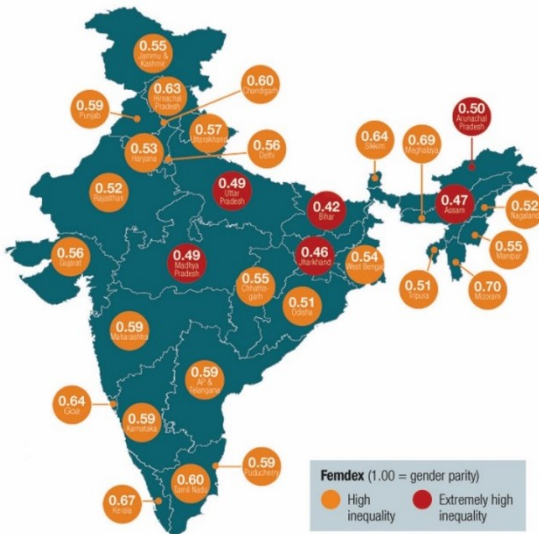
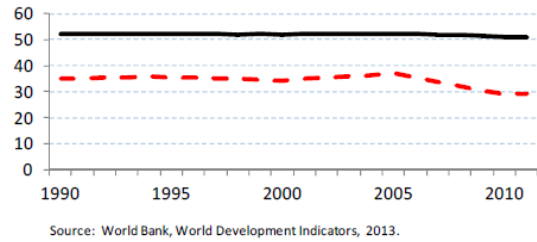
MGI Female Empowerment Index or Femdex score—based on a sub-set of 10 of the 15 indicators for which data are available at the state level in India and broadly representative of the GPS. A wide variation was found in gender equality among India’s 32 states.

The simple average Femdex score of the five states that are closest to gender parity—Mizoram, Kerala, Meghalaya, Goa, and Sikkim—is 0.67.



Female Labor Force Participation in India vs. World Average, 1990 to 2011 (in Percent of Female Labor Force Age 15+)

The Indian FLFPR has been stagnant or declining for the last 20 years and been exceeded significantly by the world average.



The simple average Femdex of 0.46 in India’s bottom five states on gender parity—Bihar, Madhya Pradesh, Assam, Jharkhand, and Uttar Pradesh. However, the top five states account for just 4 percent of India’s female working-age population, while the bottom five comprise a much larger 32 percent. MGI’s GPS and Femdex analyses both find strong linkages between gender equality in work and in society.

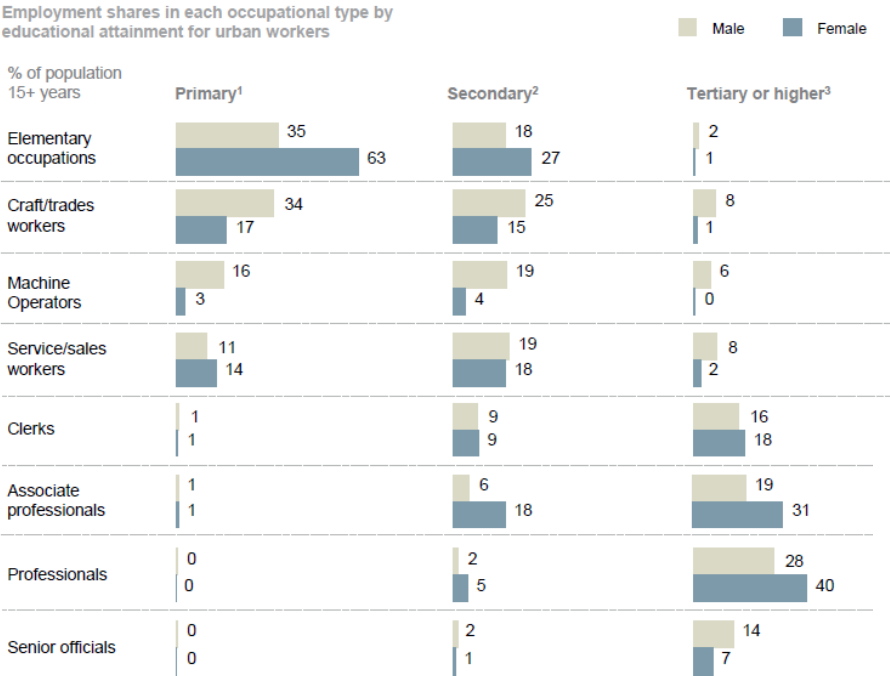
As per the *Catalyst. Quick Take: Women in the Labour Force in India*. New York: Catalyst, 2017, 13.4% of Indian working women have a regular salaried job (2013) compared to 21.2% (2011-12) of working men aged 15-59. In terms of economic status, Indian women only make up an estimated 30% of all economically active individuals and earn 62% of a man's wages for similar work.²⁸

Industries like Basic and Infrastructure, Energy, Mobility and Information and Communication Technology- currently report a particularly low overall female workforce participation: 16%, 19%, 19% and 24% relatively. Additionally, these industries recruit fewer women into junior positions and also report a more dramatic drop off of female employees between junior and senior level positions. However, it is important to keep in mind that the gender composition of todays junior roles will be reflected in 2020's mid- level roles, and that the gender breakdown of today's mid-level roles will similarly

carry through to 2020's senior roles.²⁹

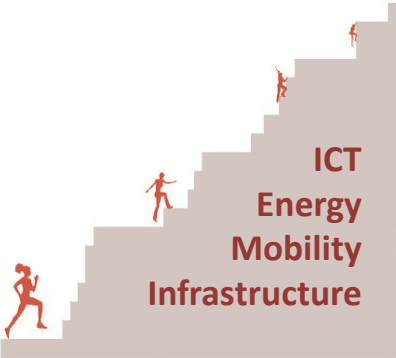
The MGI study also analyses the NSSO data which suggests that, in 2011 to 2012, tertiary-educated women in India were 1.5 times more likely to participate in the labour force than secondary educated women. Women with a secondary education were more likely to be in professional jobs than women with only a primary education. For example, 23 percent of secondary educated women were in jobs as professionals or associate professionals, compared with only 1 percent of primary educated women. Average wages also increase significantly with education. Primary-educated women earn about 120 rupees a day on average, while tertiary educated women earn 584 rupees per day.

Women with higher educational attainment tend to occupy professional roles more than men do



1 Those who have completed at least Class V but not Class XII
 2 Those who have completed at least Class XII but not a college degree
 3 Those who have completed at least a college degree

SOURCE: National Sample Survey Organisation, 68th round of employment and unemployment, 2011-12; McKinsey Global Institute analysis



While the significance of education in understood, lack of supporting infrastructure forces girls to give up on their education. In July 2012, Our Ministry of Drinking Water and Sanitation termed India - the world's capital for open defecation. More than half of our population and 70% of women lack access to a toilet. As a result, girls and women from urban and

rural slums are forced to practice open defecation leaving them vulnerable to sexual harassment, humiliation and even rape. Not just in the public domain, but lack of toilet facilities within the school premises also forces girls to give up on their education.

According to American India Foundation, In 2013 over 14% of female students between the ages of 7 – 16 went missing from school in Maharashtra, as opposed to 11.7% in 2012. Thus, it seems that although the prevalent ethos and the legislation (including the Right to Education Act of 2008) in India nearly guarantees that every Indian student will start schooling, it does not yet have the abilities to ensure that the environment to actually attain an education exists.

Also, as of 2012, 40% of all Government Schools lacked a functioning common toilet,



and another 40% lacked a separate toilet for girls. This creates even more reluctance to allow for girls to be educated.



Source: *The 3 Biggest Reasons that India's Girls Drop out of school* by Nisha Bala, American India Foundation

In lower income neighborhoods, women and girls have the added responsibility of collecting potable water. These areas do not have proper drainage with water logging and open drains becoming breeding grounds for infection carrying insects. As women are the primary caretakers, any illness in the family immediately impacts her routine. In addition to the security issue, women themselves face hazardous health risks which contribute to diseases such as cholera, typhoid and dysentery.

In the public realm, majority of the toilets built are only for men.

According to a study done by ActionAid in Delhi, 2 out of every 3 toilets public toilets do not have any provision for women. Out of 229 toilets surveyed, 149 toilets had some provision for women but had functional issues like cleanliness, lack of hygiene and maintenance. Safety measures were also found to be a major concern.

Out of 149 women's public toilets surveyed,

- More than 66% women's toilets did not have a working flush and 53% did not have running water facility.



- Over 51% did not have facility to wash hands and 61% did not have a soap.



- Over 50% of the women's toilets were unlit.



- 46% of toilets were found unguarded and Almost 30% toilets did not have doors.



- More than 45% toilets did not have mechanism to lock from inside.



Source: *Public Toilets in Delhi, A Status Survey* by Action Aid

The design of these facilities too is critical. An open structure with urinals along the footpath will force a woman to either walk on the road or to cross the road and walk on the other side. Also, despite the presence of more public toilets for males, their



Source: Academic Project, Dept. of Urban Design, SPA Delhi

Another major issue which affects the participation of women, especially single women, face is the lack of housing options both rental and self-owned. Women's group working with victims of violence, desertion, rejection from natal or matrimonial family and cheating by their relatives, discuss that while it was relatively easier to find jobs and school-admission for children the most difficult task was to get an accommodation for these women.³⁰

In the peaceful areas of India, 1/10th of the households are headed by divorced, deserted and single women. In our country, in the conflict prone areas, over 30% households are headed by women. Even if they have money, they face hurdles while looking out for a rented place or a house on an ownership basis. As primary user of housing, women's stakes and requirements are the highest in housing. For them, beyond shelter, housing is a place of employment, a place for social interaction, a place for childcare and a refuge from social instability and sexual violence.

Lack of affordable housing near work places cause discouragement to women to participate in the work force. This problem extends to the transgender community as well. The proportion of transgender people working is also low (38%) compared to 46% in the general population. Only 65% of the total working population are main workers — those who find work for more than six months in the year — compared to 75% in the general population.³¹ The majority of Hijras have adopted 3 main occupations, i.e. Toli (badhaai), Mangti (begging) and dhandha (sex work). According to statistics, about 72% of Gharana-based Hijras are involved in sex work and most of the explanation by the Hijras for the fact is it being practised out of necessity for making money (NIE

number and location falls short and public urination is rampant across public spaces in the country. Just like open urinals, public urination too affects a woman's movement along the streets, in parks and market areas.



Report 2013). Lack of involving them in the formal sector not only adversely affects the country's economy but also continues to restrict their social and economic upliftment.

The employment of 21 transgender people in the Kochi Metro was a huge step towards gender equality. Sadly, eight transgender people resigned within a few days as they were not being rented out houses or rooms. This example best illustrates that a holistic approach is needed and focusing on only one aspect will not create the ecosystem that is necessary for a more gender-balanced work force and economic development.

"TRANSGENDER STAFF QUILTS KOCHI METRO"



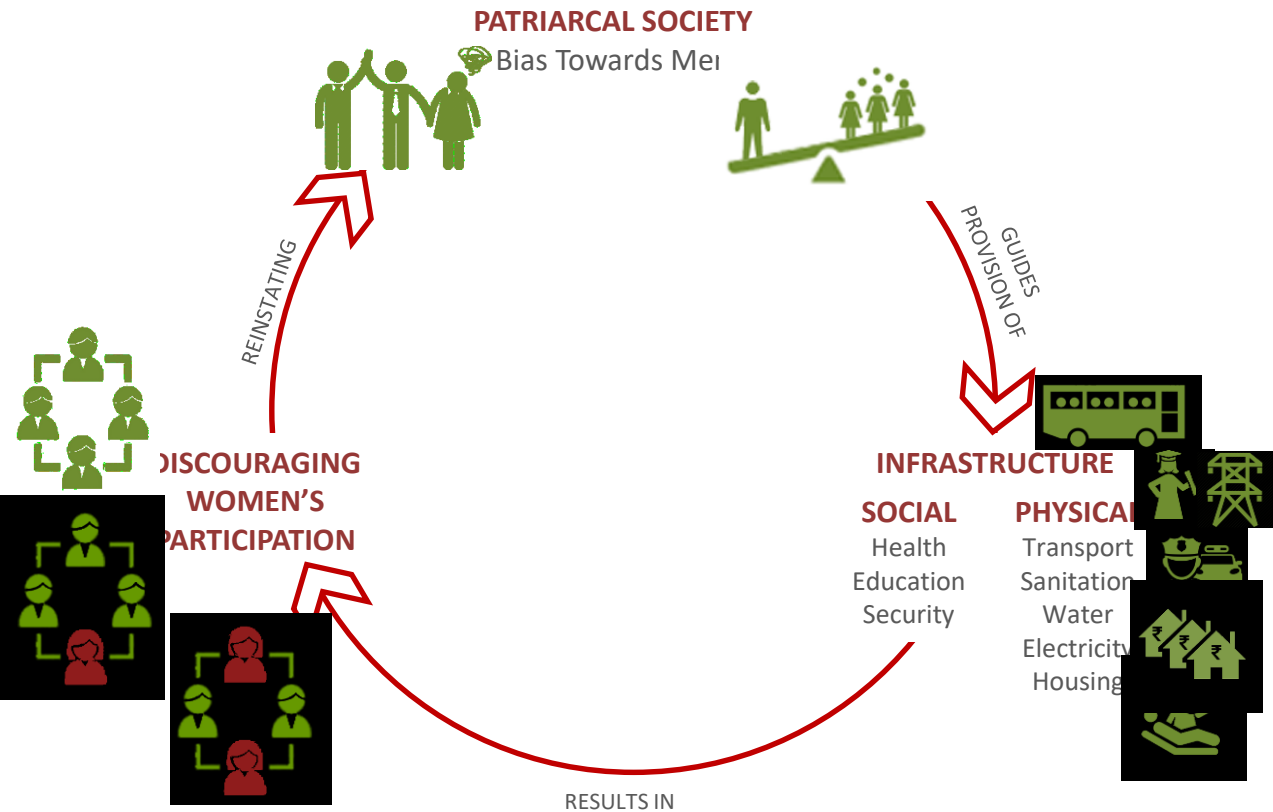
Source: A video published by NDTV, 8th July, 2017
www.youtube.com/watch?v=6izjq0twisM

Social Impact

As per the Trading Economics data, in India only 39.3% women participate in the three decisions (own health care, major household purchases, and visiting family) in the age group of 15-49. Moldova ranks highest with 92.8% followed by Ukraine with 90.1% participation rate all three nations having an at birth sex ratio of 1.06 males/female.³² The lack of participation of women in the decision making processes of the household are common in patriarchal societies where men are in a position of dominance over women. This lack of a ‘voice’ combined with their time-poverty and resource-poverty, does not

allow women to have ‘choices’ or ‘options’.

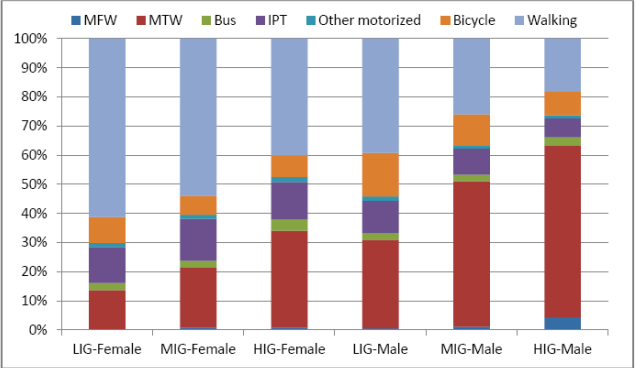
The patriarchal society also results in lack of basic facilities for women making their interaction with public space inconvenient and fearful. This results in further limiting their options and opportunities to engage in the service industry and public places. The absence of female participation further reinforces the patriarchal set up and infrastructure provision continues to be gender neutral.



The choices are more limited for women in the lower income neighbourhood than those of higher income groups. In Rajkot, travel patterns were studied for both the genders and different income groups. On the whole, the trip rates and lengths were low in Rajkot, as the city's diameter is about 20 kms. Women of the Middle Income Group (MIG) had the highest trip rate among the three income groups, followed by the Low Income Group (LIG) and then the High Income Group (HIG). LIG women need to go out of the house to work, but make short trips, some of which might not be considered as a trip in the study. In Rajkot, 54% of LIG women made a trip every day as compared to 45% of HIG women.³³

In HIG, 40% of the women walked while just 18% men walked. In MIG, 54% of women walked whereas 26% of men walked. In LIG, 60% women walked and nearly

40%men walked. This implies that with an increase in household income, there is a shift towards private motorized vehicles by men and a shift towards public transport by women.



Note:
MFW = Motorized Four Wheelers; MTW = Motorized Two Wheelers;
IPT = Largely autorickshaws

A “Smart” Approach to Gender Mainstreaming

It is learnt from the various impacts and issues highlighted that no one individual infrastructural sector is responsible for creating the system unsafe for women. Literature strongly presents that there are multiple interlinked factors that overall affect a women’s safety and hence her participation in the public realm.

A holistic approach is critical for including the presence of women in all sectors. Four focus areas to achieve this are:

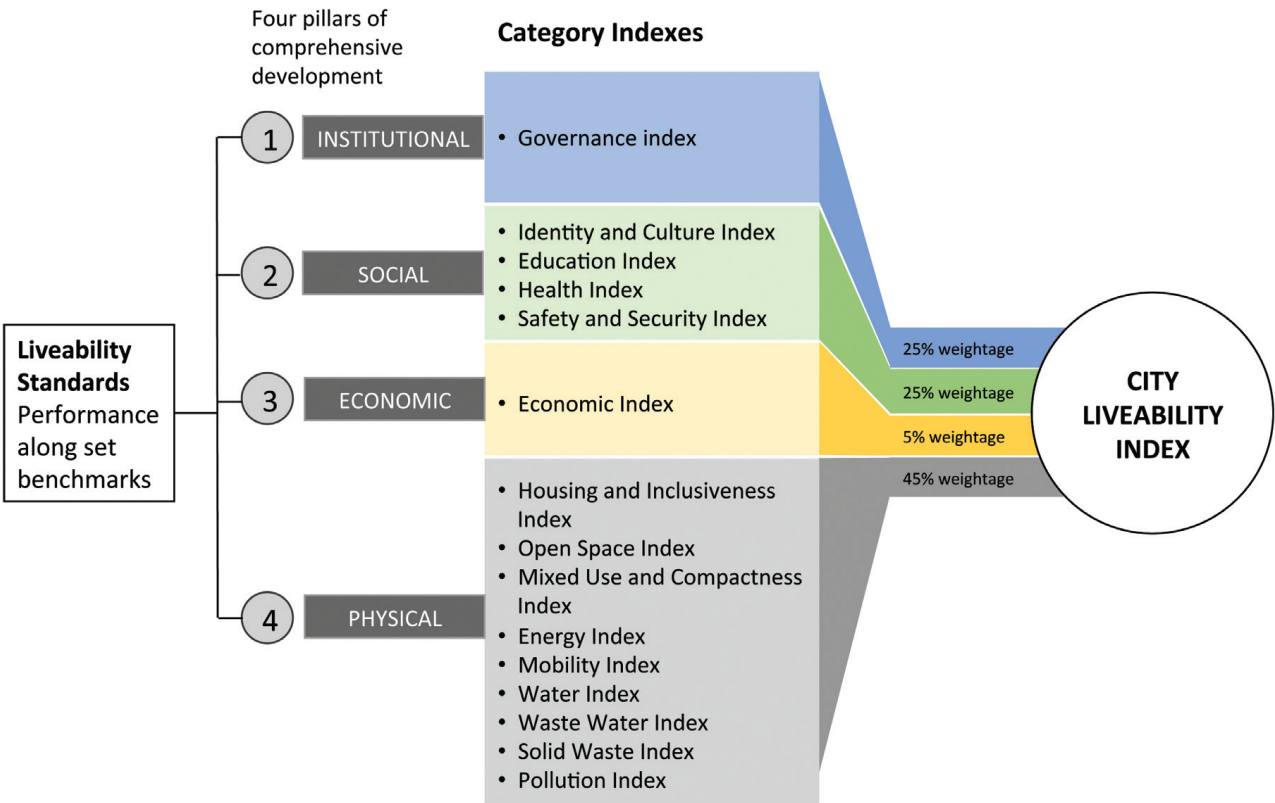
- 1. Policy Formulation
- 2. Effective Enforcement
- 3. Infrastructure Upgradation
- 4. Public Consultations and Campaigns

Specific policies for women along with their correct enforcement and campaigning for change in social stereotypes and more sensitivity while designing infrastructure would bring about inclusion of women and transgender people in a holistic manner.

More policies like Mother and Child Tracking System (MCTS) and The Indira Gandhi Matritva Sahyog Yojana which focus on pregnant and lactating women should

be introduced to ensure better health of women and the child. Rajiv Gandhi Scheme for Empowerment of Adolescent Girls – Sabla is focused on the overall development of ‘at risk’ girls (ages 10-19). Girls under this scheme are given proper healthcare and education with an aim to make them self reliant and capable. For these policies to be effective, proper enforcement and checks need to be carried out.

The Ministry of Urban Development (MoUD) has developed a set of ‘Liveability Standards in Cities’ to generate a Liveability Index and rate cities. The source of the Liveability Standards are the 24 features contained in the Smart City Proposals (SCPs), which have been grouped into 15 categories. These have been further categorized into four pillars – Institutional, Social, Economic and physical, for comprehensive development. Gender mainstreaming in each of the four focus areas for each of these four pillars, will result in improved rating under atleast one category and an overall increased rating of the city on the Liveability Index.



Source: Liveability Standards in Cities by Ministry of Urban Development

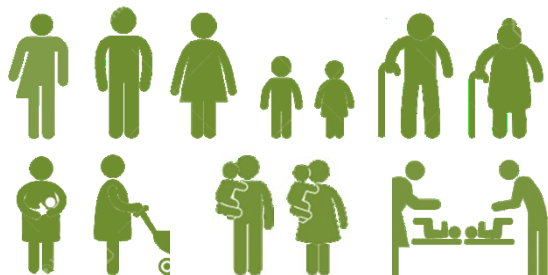
Policy Formulation and Effective Enforcement

As discussed earlier, there are international level commitments as well as national policies citing the need for gender mainstreaming in urban infrastructure. India is a signee of the New Urban Agenda and has also incorporated the same in the National Policy for Women as well as in the Smart Cities Mission. However, this is yet to percolate down to the city level and be enforced by the city governments and the Urban Local Bodies/Municipal Corporations.

City governments need to formulate policies mandating all departments and organizations to ensure gender mainstreaming into each infrastructural sector. Strategies specific to each sector based on the respective issues and challenges need to be formulated. Impact Assessment Guidelines also need to be developed.



The **MoUD's** **Liveability Index** : the collection of gender segregated data to gain an understanding of the usage patterns and the issues faced by each gender. The data would then further inform the policy decisions for the various services. Also, since each category of MoUD's Liveability Index has quantifiable indicators, this data would also help towards measuring them.



It is important to note that in a household, our society is starting to change and men are starting to get involved in household tasks and caretaking. This aspect too needs to be taken into account for failing to facilitate a man's involvement would continue burdening the woman. For example, it is as difficult for a single father with a daughter to use the gent's washroom as it is for a single mother with a son to use the ladies washroom.

Checklist for Gender Segregated Data

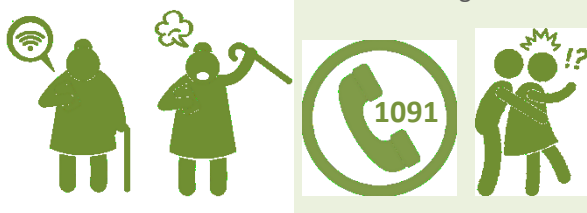
- Travel Patterns – Modal share – walking, cycling, IPT, bus, rail/metro, private vehicles – 2-wheeler or car. Re-define 'peak hour' for women.
- Experiential quality of the mode of travel & issues/problems faced.
- Comfortable walking and cycling distance.
- Mapping of the routes along with the mode. The data should be available in a GIS format.
- Trip Function – job, education, domestic chores, recreation, health.
- Travel with family/friends/kids/elderly/person with disability or alone.



- Housing – own/rental – single or shared/hostel.



- Percentage having access to Internet on desktop/smartphone
- Percentage having access to "smart" technologies.



- Awareness/Knowledge of Emergency Helpline numbers/Apps/laws.
- Definition of harassment.
- Personal experience of harassment – staring/comments/touching/stalking.
- Experience of witnessing harassment and their response or reason behind choosing not to interfere.
- Confidence in approaching authorities – transport/Police/Employer or at Education institute.
- Emergency Response Time of Police.

Standards and Benchmarks

A re-look at the standards and benchmarks being followed is needed from the perspective of a female user who can be a young girl or an expecting mother or mother with infants or an elderly woman. For example, as highlighted earlier, the 500m walking radius would be suitable for an average build man but not for a woman. Changing this standard and providing services within shorter distances would encourage greater pedestrian movement thereby reducing carbon emissions and air pollution (i.e. categories 9, 11 and 15). Therefore, a policy to re-evaluate design benchmarks and standards would help improve upon various indicators



1. Facilities of different scales – Clinics, dispensaries, and hospitals, both public and private and general as well as speciality, should be revisited. The benchmarks for provision at certain distances for certain populations and their geographical distribution in the city, need to be re-evaluated. This is important considering the biological differences as well as the fact that women are primary care givers. The special medical requirements of transgender people too need to be



City App

Each city should develop an online and mobile based application (the City App) with information (both time and location) for various infrastructure sectors integrated. Along with information it will also enable one to track and report based on the exact GIS location. For example, one shall be able to track the arrival and departure of public buses as well as report any incident of harassment or even delay. The tasks of various government agencies can be integrated on the City App. For example, in case of poor streetlighting due to the light not working or the light getting covered by leaves etc., a citizen can report the same on the City App. This information can be linked to Police Patrolling Team who can then immediately verify the same for the concerned Urban Local Body (ULB) to proceed to fix the issue. This will help reduce response time and increase citizen participation and help improve governance (i.e. category 1).

Increasing Female Work Force Participation

In each sector including the IT/GIS unit, policies to involve women and trans-people in the workforce are needed (i.e. category 6). This requires that the working conditions be made comfortable and safe. As discussed earlier, an entire ecosystem has to be created catering to various needs of comfortable employment, safe commute, and affordable abode. Proper toilet and first aid facilities should be provided within the campus along with facilities like sanitary napkin vending machine installed in the toilets. These work places need to be located in safe areas well served by public transport facilities.

A learning from the Kochi metro example is that affordable housing also needs to be provided for women and transgender people to effectively involve them in the work force. Rental policies to provide housing and ensure proper tenancy without fear of sudden eviction are needed. Safe and secure hostels can also be provided. The needs of different sectors vary. Employing women in educational institutions requires safe commute during the day. But for employing more female nurses in hospitals and dispensaries requires ensuring safe commute at night and maybe even odd hours along with rooms for night stay.

Employment of women and trans-people should be on merit basis and not just to fill the seats reserved for them. Most women do not seek employment as they have to look after children and elderly. Creches and day-care centers should be provided within the campus or nearby for women to be able to leave their children and elders under proper supervision and care.

Policies for Gender Sensitization should be introduced for everybody in the working environment (from teachers to school going boys to administrative staff) along with ensuring its enforcement and checks after every three months. For example in the transportation sector, all local bodies should ensure that the bus drivers and conductors/auto drivers etc are all made to undertake gender sensitization trainings. They should be informed about the various issues women and girls face while travelling. They should be trained to identify the problem and be empowered enough to take appropriate action against the defaulter. This would also prepare them to include women in these jobs and welcome them in their working environment as colleagues.

Along with these policy level interventions, their proper enforcement is also essential. This needs to extend to each infrastructure sector i.e. transportation, sanitation etc. which should be sensitively designed to meet gender specific needs in the public realm as was done in Seoul.

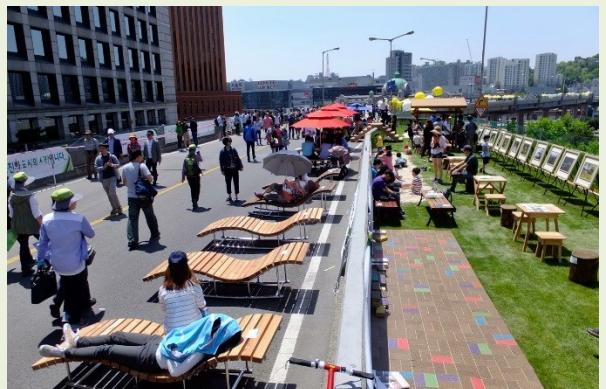
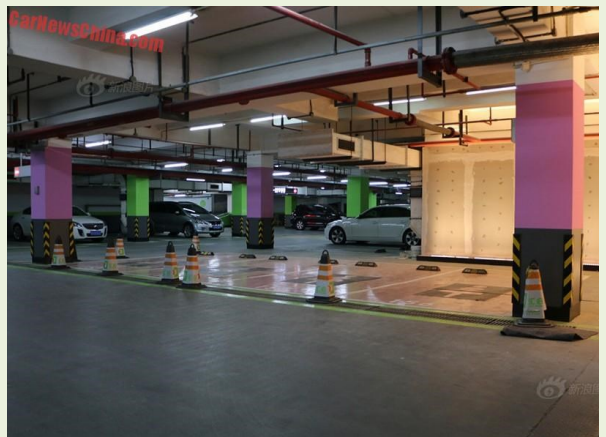
“Women Friendly Seoul”

Seoul City is designing urban space and facilities from the viewpoint of gender equity to reflect the needs and preferences of women.⁶ In Seoul, a 2010 survey revealed that one out of every two women feared they might become a victim of sexual assault.⁷

The project was launched by Mayor Oh Se-hoon after realizing that the then Urban Design had been focused on males since they were the sole breadwinners. *“The ultimate idea of ‘Women Friendly Seoul’ is that when a woman is happy, everyone is happy. It is not like women taking men’s share of the pie,”* Cho said. *“When equipped with hardware — social facilities considering women — and software — the caring mind of women — Seoul can truly be women-friendly. A woman’s happiness is a barometer of society’s happiness.”*⁸

Under this project, the city designated nine major priorities to maximize the visible effect. The interventions made included - Improving and expanding convenience facilities for women like making dressing rooms co-ed, improving women’s restrooms in the market, making handicapped toilets in subway station gender-specific.⁹ Parking spots were painted pink and reserved for women. These were a bit wider and longer than the average spot and closer to elevators.¹⁰ Sidewalks were resurfaced in a squishy material to make walking easier for people who wear high heels especially since it was noted that a lot of people who wore high heels were women. In buses, the hand straps were lowered so that women could hold on to them easily. Streetlighting was improved along with installing CCTVs to ensure safety and convenience.

The Seoul-style Nursery School project is meant to satisfy working moms who need a place that can care for their children. Public day care centers despite being more popular than private ones are less in number. To provide better care for children, Seoul City certifies private nurseries that meet standards as Seoul-style nursery schools and sponsors them. These certified nurseries have IPTVs so parents can watch their children from work and even look up information on ingredients used for meals.¹¹



As a woman's interaction with the public realm is mostly to perform a certain task and rarely for recreation, the different purposes and spaces need detailed study i.e. the various public places that women use along with the various modes of transport.

Public Places

Different public places pose different difficulties for women to tackle. A park be it a small neighbourhood park or a large area or city level park, can be an unsafe place. Parks with no visual connection with the outside area and its landscaping creating secluded pockets are found to be unsafe. Poorly maintained and unlit spaces further adds to one's fear of being in a public space.

Market streets and plazas too become unsafe when they are over crowded. Women tend to find both over crowded and completely isolated public spaces as unsafe. The presence of some hawkers and vendors adds life and activity to the streets offering some visibility. Roads and streets with high opaque boundary walls are avoided.

The presence of beggars and drug peddlers makes an otherwise safe public space feel unsafe. Women tend to avoid these stretches. This is common outside temples, both at the neighbourhood and the city scale. Religious institutions traditionally were active and preferred places for congregation and celebration. However, the activities spilling on to the streets and the footpath specifically, makes women's movement uncomfortable.



Transportation

A person's commute from one point to another consists of four stages. These are:

- 1) First Mile Connectivity i.e. from origin to mode of public transport.
- 2) Waiting at the Bus stop/metro station.
- 3) Travelling in Public Transport.
- 4) Last Mile Connectivity i.e. from transit stop to one's destination.

Mostly, one walks or cycle or uses an Intermediate Para Transit mode (auto/cycle rickshaw/shared auto) for first and last mile connectivity. Though at times these modes do become the main mode of commuting as highlighted earlier, especially for women. Each stage and mode has its own issues which makes it unsafe and difficult for women.



1. Walking

As discussed earlier, most women tend to walk. However, the current state of roads in our cities makes walking extremely unsafe. The absence of a dedicated footpath results in accidents and even fatalities. Even where footpaths do exist their poor condition makes it difficult for one to walk. Along with proper provision of a footpath these also need to be made accessible for people with any form of disability.



1.1 Design of footpath

The footpath should have a minimum width of 1.8m and a clear height of 2.2m throughout its length (as per IRC:103-2012 guidelines). The width of the footpath for areas of different land use should also be (as per Table 2 of the aforementioned guidelines).

1.2 Well-lit at night and well-shaded during the day.

A white colour light source to differentiate from the lighting of the vehicular road, with a lux level of 25-40 units is recommended. The footpath should also be well covered with trees in a manner that their foliage does not hinder the light falling on the footpath at night in accordance with the IRC:103-2012 guidelines.

1.3 Proper surface quality with no potholes and tactile pavers for the visually impaired.

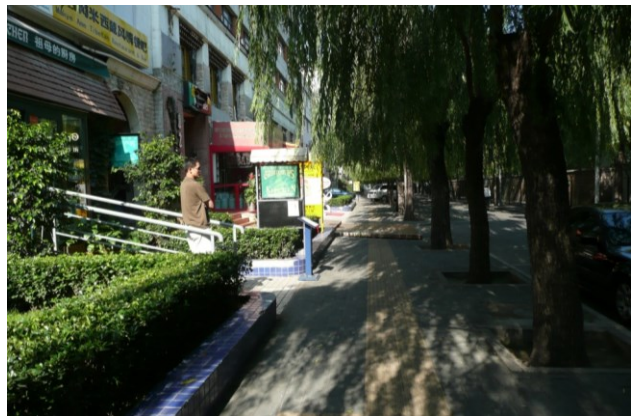
The footpath should be properly paved with firm and even surfaces. This is essential for people using walking-sticks or crutches or wheelchairs. Evenly paved surfaces would also make the walking experience easier for pregnant and menstruating women and women wearing heels. Proper tactile pavers should also be laid throughout the pedestrian network and should widen up at crossings (as per guidelines given in IRC:103-2012)

1.4 Proper kerb and median height.

The height of the kerb should not be greater than 150mm and medians should be a maximum of 250mm high (as per IRC:103-2012 guidelines). Care should be taken to design barrier free crossings in the case of planted medians.

1.5 Should have ramped ingress and egress.

A high step or a steep ramp makes it difficult for pregnant women, women walking with their kids in strollers and elderly women to get on to the footpath. Hence, the gradient of the ingress and egress ramp should not be greater than 1:12 and other details should be as per IRC:103-2012 guidelines.



Source:<https://3.imimg.com/data3/WS/PQ/MY-3319377/kerb-stone-250x250.jpg>

Source: Academic Project, Dept. of Urban Design, SPA Delhi

1.6 Continuity and consistency of footpaths should be ensured.

Footpaths should be continuous with minimal breaks (as per IRC:103-2012 guidelines) as this makes the walking experience easier especially for elderly women.

1.7 Design of crossings

At grade crossings

At grade crossings are recommended for making it easier for women on wheels, elderly, pregnant women and women with strollers to cross to the other side of the roads.

Foot over bridges

Often the foot over bridges are occupied by the homeless and beggars which makes it uncomfortable and unsafe for women to use them both during the day and night.

Subways

Due to the unmaintained conditions of subways, these also tend to become spaces for beggars and drug peddlers rendering them unsafe and hotspots of crime.

Hence, design of foot over bridges and subways should also be taken care of (in accordance with the IRC: 103-2012 guidelines).

1.8 Obstruction free movement

The continuous minimum width of the foot path should be clear of streetlights, trees, electrical units, garbage bins, police booth, public toilet, hawkers, vehicles, stops/stands, street furniture etc. Dedicated space along the footpath should be allocated for provision of such activities.

1.9 Proper visual connectivity

Identification of blind spots in the city, based on the survey and re-design these location points is crucial as they tend to become unsafe and poor visual connectivity makes women walking on these paths vulnerable to sexual harassment.

1.10 Dissemination of Information

50% of advertisement space should be dedicated to display of Emergency Helpline Numbers and

campaigns against sexual harassment in all major languages of the region.

1.11 Mixed use development model

The new areas being developed should be based on the mixed-use development model to support trip chaining nature of activity of women and promote natural surveillance. This also helps in a compact development thereby encouraging walking.

1.12 Eyes on the street

Areas with high boundary walls and no or few eyes-on-the-streets become unsafe for women walking along these paths due to poor visual connectivity. These areas should reduce the height of the opaque surface and wherever required height could be acquired by the use of grills or fences mounted on the opaque surfaces.

Alternately, small functions like ATMs, Police Booths, Safal can be incorporated in the setback areas. Creating hawker zones will also help activate an area making it safer for women and support their nature of movement as they would have to walk shorter distances for daily activities. Including street furniture in the green strip along the footpath will help create pause-points and add visibility.

1.13 On-street parking

On-street parking forces women to walk on the vehicular carriageway. Not just private vehicles but often autos, taxis, tempos, shared autos, private buses etc are parked along or on the footpath. The drivers often occupy the footpath for sleeping or playing cards or loitering. Service lanes and green patches are also used for parking mini buses, shared autos, buses and private buses. This makes crossing the stretch very difficult for a woman. The fact that on-street parking is free makes it rampant across cities.

On- street parking should be discouraged and penalties should be introduced for the act. Instead, dedicated space for parking should be provided.



Source: Academic Project, Dept. of Urban Design, SPA Delhi

2. Cycling

Second to walking, cycling is the most preferred mode of commuting for women. It reduces time poverty compared to walking and is non-polluting. However, the lack of provision for cycling makes it a less preferred option. Developing a city level cycling plan entails providing an entire network of cycle tracks and not just creating cycle tracks along a few isolated stretches of road. A Public Bicycle Sharing system can also be put in place.



2.1 Designated cycle lanes.

Tracks dedicated for cycling, clear of the vehicular carriageway and pedestrian footpath should be provided. The minimum width should be 2m for one-way movement and 3m for two-way movement (as per IRC: 86-1983).

2.2 Well lit and shaded.

The track should be well lit with the spacing between two consecutive light poles being 12-16m considering the pole height to be 4.5m-6m (as per ITDP and EPC guide book *Better Streets, Better Cities*). Trees lined along the track would ensure shade making the commute comfortable. However, the tree foliage should not cause obstruction to streetlighting at night.

2.3 Continuous and Paved

The cycle tracks should be continuous with minimum crossings to allow for reasonable speeds. The crossings should be designed so as to slow vehicular movement while allowing smooth movement of the cyclist. The tracks should be constructed to have a smooth finished surface. Many women from lower income neighbourhoods cycle even during pregnancy. A smooth levelled surface is a must to ensure their safe and comfortable commute.

2.4 Public Bicycle Sharing (PBS) System

A PBS system can be introduced in the city (as per MoUD's *Public Bicycle Sharing Guidance Document*). This would allow one to access bicycles for a short duration trips of women from a starting point and return it near their destination. These docking

stations for bicycles are provided at various locations across the city. Their sizing is done based on the demand at the concerned location. Cycles with child carts should also be provided.

2.5 PBS Stands/Docking Stations

The stands should be designed to allow parking of private bicycles as well. Certain bicycle bays can be wider to ensure convenient use by women with children and/or carrying groceries etc. These should be well lit and well maintained.

A map indicating the bicycle network along with location of all the docking stations should be installed at each stand. Additional information on the location of Public toilets, Clinics/hospitals, Police Booths and Station, and Cycle repair shops should also be indicated in the map.

Signages should be installed to provide information on emergency numbers as well as messages against sexual harassment. The docking stations should be provided clear of the footpath so as to not disrupt pedestrian movement.

A bicycle storage station with changing rooms and shower facilities for cyclists can encourage people to use bicycles for longer distances. Well designed & well maintained facilities with adequate light & ventilation, lockers can be attractive to use. It should be separate for men & women equipped with their specific needs. (MoUD's Guidance Document for Non-Motorised Transportation Plan).

2.6 Integration into the City App

The information on cycle tracks and location of docking stations should be provided on the City App.



Source: <http://incredibleorissa.com/bhubaneswar-public-bicycle-sharing/>

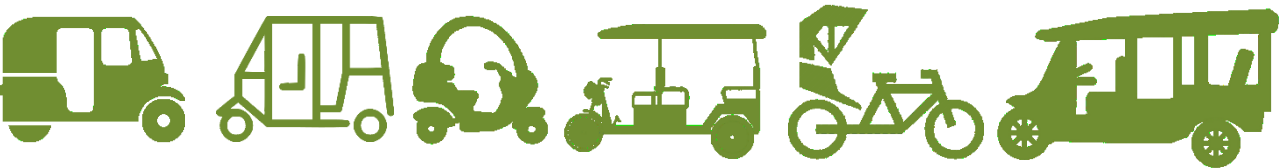


Source: <http://indianexpress.com/article/india/bhopal-500-gps-enabled-german-bicycles-50-stations-in-citys-smart-project-4488527/>

3. Intermediate Para Transit

Autos, Shared Autos, E-rickshaws, Cycle Rickshaws, Taxis

Intermediate para-transit facilities are a critical means of achieving last mile connectivity especially for reducing time poverty. Shared facilities not only reduce travel time but also travel cost hence making them a desirable option. However, these are also the most unsafe and a hotspot for sexual harassment. Individual autos and taxis though safer are more expensive and hence not an option for most women.



3.1 Registration of each vehicle and its driver.

Proper registration of all vehicles, including private taxis and their respective drivers should be mandatory. Background checks of the drivers should be done before the commercial driving license is granted and their information should also be available on the city app for everybody to be able to access.

3.2 Metering and regulation of fare

Proper metering of all vehicles should be ensured with fixed initial and per subsequent kilometer fare. It should also be ensured that this metered system of fares is followed by all and a penalty for violation should be introduced.

3.3 Design of vehicles

Cycle rickshaws

The height of the cycle rickshaw is too high for elderly and pregnant women to climb. Hence, new designs with lowered seat heights should be explored.

Shared autos

Seat widths of shared autos should be such that two passengers are able to comfortably sit without

brushing of shoulders and at the same time does not allow a third person to be accommodated to combat overcrowding.

3.4 Emergency response and complaint mechanisms

Complaint mechanisms regarding fares and sexual harassment, speeding and rash driving and overcrowding should be set up along with their emergency responses.

These complaint mechanisms should be available at the stop/ station as well as on the city app discussed earlier.

3.5 Surveillance

Surveillance can be done using CCTV's. These help in checking incidents of sexual harassment.



- Poocho, a Government initiative in Delhi allows one to:
- See the location of autorickshaws and taxis in close proximity and call the driver directly to the pick up location.
 - Rate one's experience of hailing the trip on an Auto/Taxis and view the rating of other commuters.
 - Access information on the estimated fare, trip distance & travel time as well as the traffic condition on the route.
 - Track the auto and check if it is coming in the required direction or not once the driver confirms willingness to render the trip.
 - Give feedback and suggestions for improvements of the app through various platforms such as facebook, text messages etc.

Source:<http://android.wikinsta.com/app/com.dimts.delhiautojunction/>

3.6 Dedicated IPT stands

Proper stands for all available modes of IPT should be built along stops/stations, outside markets, educational institutes, offices, and in residential areas.

The design and orientation of these stands should ensure that minimum conflict with vehicular road space occurs and are at the same time clear off of the pedestrian foot path. A dedicated space for waiting of the drivers should also be made with a toilet facility for men and women as per standards for public toilets in URDPFI guidelines.

3.7 Dissemination of Information.

The driver's information (name, address, contact number and vehicle number) should be displayed in the vehicle.

3.8 App based GPS tracking of all vehicles.

Information like availability of IPT, location of IPT stands and information of all drivers should be made available on the City App with GPS tracking of the vehicle. Routes of the shared autos and hiring of autos should also be made available on the app.



Source: Street Design Guidelines--UTTPEC-DDA



Proposal for Multi Modal Integration outside Chattarpur metro station in Delhi by Oasis Design.

Source:<http://oasisdesigns.org/mmichattarpur.asp>

Ecocabs "Dial-a-Rickshaw" is a cycle rickshaw scheme started in June 2008 in Fazilka, Punjab, initiated using intelligent transport tools, it arrives at resident's doorsteps following a phone call.

The scheme is a first of its kind in the country as well as in the world. Aimed at improving the unorganized cycle rickshaw transport system in the town and providing an affordable means of mobility to the city residents.

Cycle rickshaws had always been the primary mode of transport in Fazilka but service levels were poor: rickshaw drivers frequently overcharged, maintenance was variable, availability was uneven through the city, and the municipal council did not enforce service quality norms.

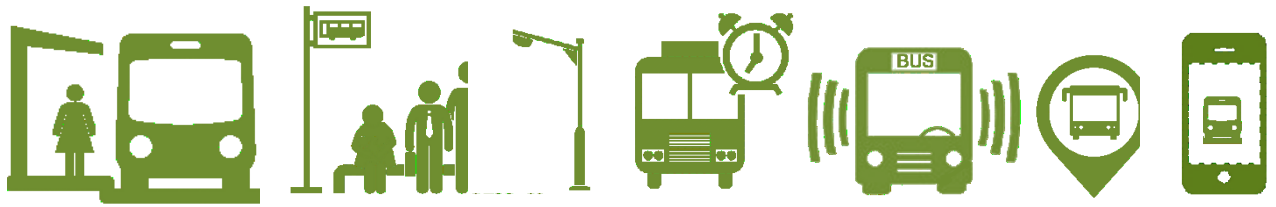
Infrastructure was put in place by handing over cheap mobile phones to some of the town's residents on a permanent basis and creating a call center to facilitate them hail a rickshaw by making a phone call.

- The quality of the rickshaw was initially improved by reducing its weight from 90kg to 65kg and adding more luggage space.
- The floor space was also reduced from 2 feet to 30 cm to help the commuters, mostly the elderly and pregnant women.
- To facilitate rickshaw access, Ecocabs mapped typical rickshaw routes and divided the city into nine zones around 1 km each in area.
- The Municipal Council built rickshaw stands in five zones for the Fazilka Ecocabs Welfare Association (FEWA) which runs the scheme. These stands can be used by any cycle rickshaw driver, even those not registered under the scheme.
- Each stand has a toilet and tea stall; larger stands have a repair shop and canteen. In lieu of rent-free space at the stand and a captive market of drivers, the tea vendor often acts as a coordinator, responsible for answering calls and dispatching rickshaws. A driver may also act as coordinator.
- BSNL sponsors all Ecocabs phone connections under a closed user group (CUG) scheme where calls within the group are free. In return, BSNL is guaranteed minimum annual usage of Rs. 400 per connection.
- There is an android application for bookings but very few avail of this, given low smart phone use in Fazilka. Approximately 300 of the 450 cycle rickshaws in Fazilka are members of the scheme.
- Advertisement space is being introduced on rickshaws from which the rickshaw-pullers can earn extra income. The members of the project receive several benefits, like free health check-ups, discounted medicines and tests, free education and annual scholarships to school-going children of the operators, digital identity card, accidental insurance for INR 50,000, better rickshaw parking facilities and free legal help cell.

Source: Draft, PC 1B 3- NMT State of the Art Review V1.0, prepared for MoUD by IBI Group & I-Trans, 2013

4. Waiting at the Bus Stop/Metro Station

Sexual harassment is rampant while waiting for public transport, though it is more common at bus stops than in the rail/metro stations. However, cases of staring and cat-calls are not unheard of at the metro station/rail platforms. The lack of mechanisms to report these incidences at bus stops adds to the problem along with the fact that bus stops are located along the roads whereas metro/rail stations are distinct public places in themselves.



4.1 Location

Location of the bus stop, metro station should be strategically determined near markets, institutes, offices and residential areas to promote activity in the area and help in trip chaining for women.

These stops and stations should also be designed as Multi Modal transit hubs to make it easy for women to seamlessly shift from one mode to the other.

4.2 Dissemination of Information

Maps indicating routes, time tables, location of public toilets, health facilities, police station/booths, ATM's should be displayed at the station along with emergency helpline numbers for women.

Digital displays should also be present displaying the real time location of the vehicle and its expected arrival time.

While it is understood that advertisements are an important source of revenue, it is essential to use 50% of the advertisement space for campaigning and messaging on sexual harassment. This will help spread the idea that sexual harassment in any form is 'unacceptable'. Also the signages should not obstruct the pedestrian movement. It has been observed that the signages are located obstructing the tactile paving as well as reducing openness and visibility of the people waiting at the stop.

4.3 Emergency response and Complaint mechanisms

Mechanisms for reporting of incidences of sexual harassment and their emergency response systems should be available at all bus stops and stations. These complaint mechanisms can be integrated with the City App.

4.4 Surveillance

Surveillance can be done using CCTV's. These help in checking incidents of sexual harassment.

4.5 Design of the bus stop

The design of the stops should ensure protection from rain and provide shade from sun during the day. At the same time, they should be well lit and open in design for better line of vision.

4.6 Facilities for bus drivers and passengers.

Bus stops should provide facilities to drivers for drinking water and using the toilet etc. This should be designed keeping in mind specific needs of the women and transgender people passengers and drivers as well.

These facilities should be available at metro and rail stations as well separately for passengers and staff.

4.7 Reduced walking distance for women to access women's coaches in metro stations

The distance of walking for women to access the ladies coach should be minimal. The location of these coaches with respect to the entry/exit points and staircases is important. In the Delhi Metro, the first coach in the direction of the train is reserved as the ladies coach. However, the staircases are in the center forcing them to walk more which becomes a concern for elderly and pregnant women. The location of staircases and lifts with respect to the location of ladies coach should be considered while designing the station.

4.8 Provisions for visually impaired and universal accessibility in metro stations

Tactile paving surfaces in metro stations should be well stitched with the pedestrian network, instruction available in braille for the visually impaired and ramps should be made to ensure universal accessibility.



Source: Academic Project, Dept. of Urban Design, SPA Delhi

5. Travelling by Bus/Rail/Metro

Bus/rail/metro are the mass rapid transit modes which are often designed for long distance travel. However, as discussed since women make shorter trips, the frequency and routes of these modes does not cater to them. Overcrowding in these modes paves the way for sexual harassment.



5.1 Employment of Women and Transgender

Policies to employ women and transgender people as bus drivers and conductors should be formulated and implemented. This would also require establishing an ecosystem and providing facilities within the bus, bus depots and around it.

5.2 Surveillance

Surveillance can be done using CCTV's in the vehicle which should be connected with the Police Control Room.

5.3 Emergency Panic Buttons.

Panic buttons should be provided for emergency cases. These should be synchronized with the Police Control Room to ensure prompt action with minimum response time.

5.4 Well lit, Clean and Comfortable

The vehicle should be clean and comfortable at all times. Surveys have revealed that lack of maintenance makes buses a less preferred option especially for elderly and pregnant women.

5.5 GPS tracking

Each bus should be fitted with a GPS tracking device. This shall be integrated with the City App for real time tracking to enable women to plan their trips. It will also help in reporting the occurrence of any incident along the journey and for the Police to reach the exact location quickly.

Along with real time tracking of the bus movement, a woman should be able to share the bus details (route number, bus registration number, details of the driver and conductor) with her family if she feels unsafe or stalked.

5.6 Fixed Signages.

Signages displaying the bus/metro route and all stops should be installed. These should be in all the spoken languages of the city.

Emergency helpline numbers should be displayed at fixed points. The LED running strip display doesn't effectively communicate the information.

Advertisements are an important source of revenue, it is essential to use 50% of the advertisement space for campaigning and messaging on sexual harassment. This will help spread the idea that sexual harassment in any form is 'unacceptable'.

In buses, the information and contact details of both the driver and the conductor should also be displayed.

Travelling in Bus

5.7 Separate entry/exits for women.

The door for entry/exit of women and men should be different so as to prevent incidents of brushing and pushing while getting on-off the bus. This becomes extremely critical during rush hours especially along crowded routes.

5.8 Seat reservation for women.

Often seats along one side of the bus are reserved for women. It has been noted that men tend to stand along the ladies seat. Since both men and women stand in the same aisle it allows for sexual harassment to occur. Reserving seats for women at the back of the bus coupled with separate entry/exits helps prevent this. Seats for women can also be reserved in the front of the bus but it still allows men to stare at women and stalk them afterwards. But this allows for the driver and conductor to keep a watch. Grills have also been installed to ensure separate sections for women in government run buses in Dehradun and Hyderabad.

(<http://timesofindia.indiatimes.com/city/dehradun/City-buses-to-have-reserved-seats-for-ladies/articleshow/49863729.cms>)

5.9 Ladies Special Bus Services.

Women-Only bus/mini-bus services can be introduced along certain routes for certain times of the day. The route and timings shall be decided based on the survey conducted to assess the demand and requirements.

5.10 Bus Design

The bus design should consider the biological differences between men and women and difference in travelling conditions of women. Women often travel with kids and/or elderly and have lots of things and bags. Women from the lower income neighbourhoods engaged in the informal sector engaged in hawking, often carry lots of goods and luggage. Working with these considerations and aiming to prevent sexual harassment significantly impacts the design of a bus.

- The floor height of the bus should be levelled with the bus stop level or not be more than 150mm high. Also there should be provision for ramped access onto the bus.
- The height of the handrails should be lower considering that the average height of women is lower than that of men.
- Handrails should also be provided in the seat side at low heights for children to hold.
- The height of the strap should be lower for women.
- The seat width should be such that it is comfortable for a man and a woman to sit.

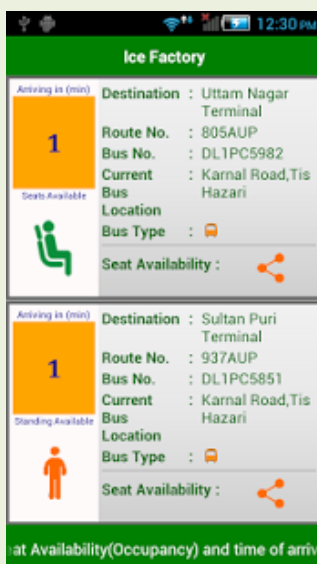


Travelling in Metro/Rail

5.11 Ladies Coach

Separate coaches should be reserved for women. While this helps in ensuring a harassment free journey during peak hours, during the non peak hours it is found these coaches are vacant while the general coaches are crowded. Reservation of coaches is also currently not mandatory for private operators like in the Rapid Metro, Gurugram.

Source: Academic Project, Dept. of Urban Design, SPA Delhi



NextBus, an application by DIMTS

The application is currently available for Orange colored Delhi Transit buses.

The application has the following features:

- Occupancy Display: Gives tentative seat availability of the bus running on a route and at a bus stop.
- Route Details: Shows the bus stops on the route and on clicking the bus stop, shows the estimated time of arrival and tentative occupancy of the bus on that stop.
- Track location of a bus: Shows the real time location of the buses plying on the route on the map.
- Trip Planner: Shows the route and mode to take to reach from source to destination. This displays orange and DTC bus routes.
- Traffic: Traffic jams for last 25 min anywhere in Delhi, feedback on traffic from users, list of user's feedback on traffic in the last hour, search for traffic situation in a particular place, congestion map of Delhi at any point of time.

Source: <http://android.wikinsta.com/app/com.dimts.delhiautojunction/>

6. Public Places

Currently, women's participation in the public places is less owing to less time and the fact that these spaces are unsafe. Making these spaces safe will encourage women to come out more making these more inclusive in return.



6.1 Visibility

The edges of all public places should be porous to allow for visual connectivity. Depending on the nature of the place this can be achieved by low boundary walls, hedges, grills and wire fencing.

Small neighbourhood parks should have the residences overlooking it.

Larger parks should ensure that no isolated pockets are created inside as these become hotspots for harassment to occur and even drug-peddlers to loiter.

6.2 Access and Movement

Parks and markets which are easily accessible and preferably within walking distance are found to be more active and safe.

The nature of movement within these spaces too is critical. Markets should have well defined and clearly segregated "public-zones" and 'service-areas". Often having to cross these service alleys becomes difficult. The public zones should be inter connected for smooth and comfortable movement.

The walking and jogging tracks in parks should be open and connecting all seating and children's play areas together.

6.3 Brightly Lit, well-maintained with Surveillance

All public places should be brightly lit at night. These should be well-maintained at all times and under CCTV surveillance.

6.4 Location of Public Facilities

The essential facilities like Public Toilets, Garbage bins and also parking areas should be located abutting the public places but not obstructing them.

Besides these facilities, the location of liquor shops too is critical as crossing these is uncomfortable for women.

Parking Zones provided outside public functions like parks, metro stations, markets etc. should be well lit with CCTV surveillance. This is also necessary for basement parkings in malls and office buildings. Parking areas for vehicles like tempos providing services like gas cylinders etc. should be well lit and abutting public functions. Separate facilities for these drivers is also needed.

6.5 Universal Accessibility

All places should be designed to be accessible to every individual with any form of disability. This entails providing ramps for movement, tactile paving, and signages in braille.



Aerial View of Connaught Place

7. Sanitation

Proper sanitation facilities for women and transgender in public places and work centers are a must to enable their inclusion and participation.



7.1 Ensure provision of toilets for female and transgender people.

A majority of the toilets built are only for men and this is a major issue that women face in the public realm. Public toilets need to be built for all genders – men, women and transgender. The number of WC’s/WB’s provided should be on the basis of the gender segregated user data.

7.2 Meet special requirements of women and transgender people.

Women’s toilets should be incorporated with space for breast feeding. Since women often travel with kids and infants, a diaper changing space is required. Each complex should have a separate toilet for people with disability.

The height and location of ventilators should not allow for anyone to peep in invading a woman’s privacy.

Toilets for transgender people also should be available. There can either be provision of a separate toilet for transgender people or a combined common toilet for the disabled and transgender people. They may also be allowed to use any of the women’s or men’s toilet. Based on the data analysis and space available, these can be combined as one unit as well.

7.3 Availability of Water supply in lower income neighborhoods.

Provision for direct water supply to each household unit should be made so that females can engage in other activities and are not time bound.

7.4 Availability of toilets for women in lower income neighborhoods.

These areas often do not have (sufficient) public toilets forcing women and girls to defecate in the open making them vulnerable to sexual harassment. Public toilets should be provided based on the female population. These should be located along safe and active areas, be well maintained. Since the houses do not have water supply or space for bathing, the public toilet complexes also need to have bathing units.

7.5 Laying of proper drainage systems in the lower income neighborhoods

A proper network of drainage system should be laid down in these areas to prevent water logging and the spread of infections and diseases arising from it.

7.6 Integration with City App

The location of the public toilets should be mapped on the City App. Along with this there should be provision for complaints to be registered in case the complexes are not being maintained like lights not working, no water supply etc.

There should also be provision to report public urination and garbage thrown in public places.

7.7 Location of Public Facilities

The public toilets and garbage bins etc. should be located clear of any movement corridor so as not to cause any obstruction or discomfort.

THE PUBLIC LOO LOCATOR

North Delhi Municipal Corporation has 1,163 urinals, 499 community toilets, 41 women toilets and 318 waterless urinals in six zones. The pilot project will kick off from Karol Bagh

There are 210 toilet complexes in Karol Bagh

Based on your location, the GPS will track all the nearest public toilets & show them on the map.

Why is it important: People often claim that toilets are either difficult to locate or poorly maintained. Recently, an e-rickshaw driver was killed for stopping some persons from peeing on the road

Rulebook: You may be fined up to ₹500 for public urination

IMAGE: GOOGLE MAPS



The Public Loo Locator

The three Municipal Corporations of Delhi are working on an app to locate all the 1800 public toilets in the city. Users will be able to give feedback if these are not clean or lack basic amenities such as water taps. The South Delhi Municipal Corporation provided location of 900 public utilities; North Delhi Municipal Corporation 350 and EDMC 550.

“Our three agencies are currently busy with the geo-tagging of all public toilets in their jurisdiction. The process included identifying the latitude and longitude location of each toilet and marking them on google map as well so that the people can easily locate them,” said an official from IT department, South Delhi Municipal Corporation.

Source:<http://www.hindustantimes.com/delhi-news>

The need for Gender mainstreaming in urban infrastructure is realized across various national and international policies. Initiatives have been undertaken in many international cities to make urban spaces more inclusive and women-friendly.

In India too gender mainstreaming has been mandated by our national policies. However, this is yet to start informing and influencing the provision of services by the city governments and the Urban Local Bodies. The Smart Cities Mission thus comes as a huge opportunity to make our cities safer and inclusive. Discussed below is the list of Smart City Indicators that shall be improved as a result of effective gender mainstreaming in urban infrastructure.

Smart City Indicators Improved

Category 1: Governance

- 1.2 Percentage of services integrated through Command Centre (Supporting)
- 1.3 Percentage of citizens using online services (Core)
- 1.4 Average delay in grievance redressal (Core)
- 1.7 Capital spending as percentage of total expenditure (Core)

Category 3: Education

- 3.1 Percentage of school-aged population enrolled in schools (Core)
- 3.2 Percentage of female school-aged population enrolled in schools (Core)
- 3.3 Primary education student-teacher ratio (Core)
- 3.5 Percentage of students completing primary education (Core)
- 3.6 Percentage of students completing secondary education (Supporting)

Category 4: Health

- 4.2 Healthcare professionals per 10,000 population (Supporting)

Category 5: Safety and Security

- 5.1 Number of streets, public places, junctions covered through surveillance systems (Core)
- 5.2 Number of recorded crimes per lakh population (Core)
- 5.3 Extent of crimes recorded against women, children and elderly per year (Core)
- 5.4: Transport-related fatality per lakh population (Supporting)

Category 6: Economy and Employment

- 6.2 Increase in collection of Professional Tax (Core)
- 6.4 Unemployment rate (Core)
- 6.5 Percentage of vendors registered and provided formal spaces (Supporting)

Category 7: Housing and Inclusiveness

- 7.1 Percentage of Slum/EWS households covered

- through formal/affordable housing (Core)
- 7.2 Percentage of slum areas covered through basic services (Core)

Category 9: Mixed Land Use and Compactness

- 9.1 Share of mixed land use area in overall city land use (Core)

Category 11: Transportation and Mobility

- 11.1 Geographical coverage of public transport (Core)
- 11.2 Availability of public transport (Supporting)
- 11.3 Mode share of public transport (Core)
- 11.4 Percentage of road network with dedicated bicycle tracks (Core)
- 11.5 Percentage of interchanges with bicycle parking facilities (Supporting)
- 11.6 Mode share of non-motorised transport (Core)
- 11.7 Availability of Passenger Information System (Supporting)
- 11.9 Availability of paid parking spaces (Core)
- 11.10 Percentage coverage of footpaths – wider than 1.2m (Core)
- 11.11 Percentage of traffic intersections with pedestrian crossing facilities (Supporting)
- 11.12 Extent to which universal accessibility is incorporated in public rights-of-way (Supporting)

Category 12: Assured Water Supply

- 12.1 Household level coverage of direct water supply connections (Core)
- 12.5 Percentage of water connections covered through meters (Supporting)

Category 13: Waste Water Management

- 13.1 Coverage of toilets (Core)
- 13.2 Coverage of sewerage network and/or septage (Core)

Category 15: Reduced Pollution

- 15.1 Concentration of SO2 - air pollution (Core)
- 15.2 Concentration of NO2 - air pollution (Core)
- 15.3 Concentration of PM10 - air pollution (Core)



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