GUIDELINES FOR AN INDEX ON GENDER FRIENDLY CITIES

A STUDY BY SAFETIPIN

KOICA
Korea International Cooperation Agency

SAFETIPIN
Supporting Safer Cities

The Asia Foundation
Improving Lives, Expanding Opportunities

About the project: This report is part of a two-year project implemented by The Asia Foundation in partnership with Safetipin and the Centre for Social Research (CSR), on "Making Cities Safe for Women in India." The project goal is to engage diverse stakeholders tasked with improving public place safety for women in three Indian cities: Bhopal, Gwalior (Madhya Pradesh), and Jodhpur (Rajasthan). Supported by the Korea International Cooperation Agency (KOICA), the project initiates an evidence backed dialogue with policy makers, police, and civil society organizations about the challenges women face in accessing and enjoying public places and proposes implementable solutions to address these challenges.

Prepared by

SAFETIPIN
Supporting Safer Cities

For

The Asia Foundation
Improving Lives, Expanding Opportunities

Supported by

KOICA
Korea International Cooperation Agency

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INTRODUCTION

Freedom of movement and equitable access to education, employment and resources is a basic human right. But because of lack of safety and fear of harassment and violence which women encounter while using public space and public transport - women are unable to fully enjoy this basic right. Such limitations have deeper ramifications on their lives. It reduces their ability to attend school or work and to participate fully in public life. It limits their access to essential services and to enjoy cultural and leisure opportunities. It also has a negative impact on their health and well-being.

Gender-based violence (GBV) refers to any act that is perpetrated against a person's will and is based on gender norms and unequal power relationships. Women and girls are more commonly affected by gender-based violence due to the subordinate status of women in many societies, discrimination against them and their higher vulnerabilities to violence. GVB takes many forms, including sexual, physical, and psychological abuse. [1]

Sexual harassment is defined as any unwanted, unwelcome and uninvited physical or non-physical action that makes a woman uncomfortable because she is a woman. [2]

Harassment in public spaces too in all its forms - verbal, visual and physical, affect women and influence their confidence and quality of life. It is a daily occurrence for many women when using public space and public transport in both developed and developing world.

This has been confirmed in a number of studies and has become a growing concern globally with cities trying to address safety issues in public spaces and transport through various innovative strategies. A study in 2010 by Jagori, showed over 90% of women had faced some form of sexual harassment while using public space in Delhi. A more recent study by Safetipin with women in tier-II cities found that 90% of women feel unsafe travelling on public transport due to fear of harassment. [3]

1 & 2. Allen, Heather (May 2018) Approaches for Gender Responsive Urban Mobility, Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities, GIZ-SUTP, Page 15

3. Kapoor, Ankita (Dec 2019) Women and Mobility – a case study of Bhopal, Gwalior and Jodhpur by Safetipin

Picture courtesy: Safetipin

NEED FOR STUDY

To address the issue of lack of safety in public spaces and fear that women and girls face in them - a tool to assess and measure the quality of built environment and its infrastructure, is essential. Safety indices for cities could be such a tool to evaluate these attributes of the city through specific indicators.

Based on the need mentioned above, work on creating 'guidelines for an index on gender friendly cities' was initiated by Safetipin. This framework once fully developed could be used to measure the level of safety in cities.

Developing this set of guidelines also attempts to build a unique tool to evaluate Indian cities from a gender safety perspective. These key indicators will help evaluate the city's safety status from a range of aspects of the built environment and its infrastructure which impacts both actual safety and its perception in cities.

The methodology undertaken to identify the indicators for the index is mentioned in the next section.

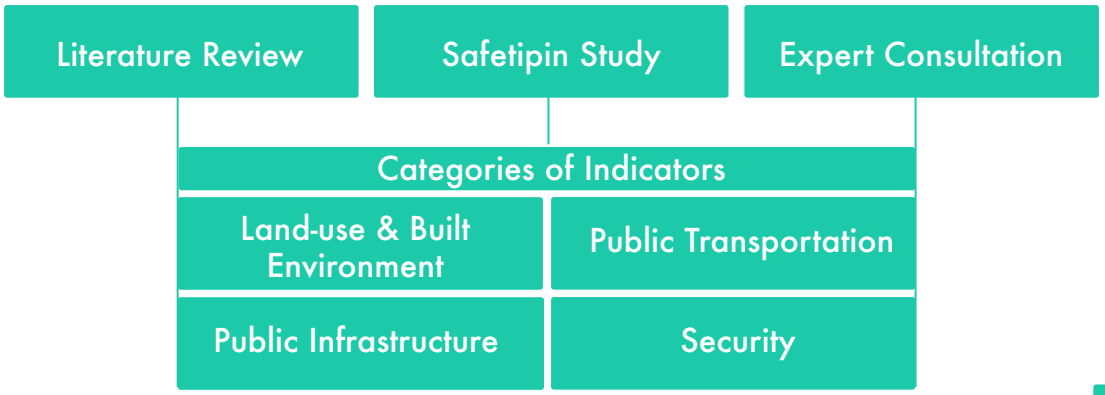
Picture courtesy: Safetipin

METHODOLOGY

Literature review of safety and liveability indices of cities helped in identifying four broad categories for formulation of the index such as, Land-use and Built Environment, Public Infrastructure, Public Transport and Security. Further, indicators were identified from authentic sources which could measure safety like, Global Liveability Index, Economist Intelligence Unit and MOUD's Liveability Index. Safetipin's collective knowledge and experience on safety in Indian cities also contributed towards deciding on the indicators.

FGDs, surveys and mapping with women done for TAF's tri-city project was too taken into account. A pilot survey of 50 respondents was also conducted to understand the user's perspective on most important indicators.

An expert's consultation with urban practitioners, designers and planners, policy makers, researchers and urban scientists helped in firming up the broader categories of indicators keeping the focus on women safety in public space.



Picture courtesy: Safetipin

LITERATURE STUDY

To formulate the Safe Cities Index, as a first step, study of available relevant literature on measuring safety as well as to identify the indicators that impact safety in public space was undertaken.

a. The Safe Cities Index, by The Economist Intelligence Unit (2018-19)

The report is based on index composed of more than 57 quantitative and qualitative indicators. These 57 indicators are divided in 4 pillars: digital literacy, health security, infrastructure safety and personal safety.

The Index focuses on 60 cities selected by The Economist Intelligence Unit (EIU), based on factors such as regional representation and availability of data. The results of the index are surprising. It was found that safety is closely linked to wealth and economic condition. Wealthy Asian cities like Tokyo, Singapore and Osaka occupied top ranks whereas their poor neighbours, Ho Chi Minh city and Jakarta fell on the lower ranks.

The different kinds of security covered by the index require distinct interventions, often by different agencies or actors. Amid this diversity, the results shows that performance in each of the pillars correlates very closely with each other. In short, cities tend to do well or poorly across every security pillar rather than having good results in one and lagging in others.

One city that focused on developing a sophisticated policing strategy is Barcelona, which was at position 11 in the personal safety category. Three years earlier the Barcelona city council decided to increase the police presence on the streets and in the subway. The strategy yielded good results. In three years crime dropped by 32%. (SCI, 2015)

"In addition to the actual drop in crime, the police presence also increased perceptions of safety among the city's residents" said Josep Rius, Chief of Staff to the Deputy Mayor of Barcelona.

It was also seen that two centuries later, gated communities were still under the fear of urban crime and violence. These residential fortresses increased suspicion and lead to greater social divisions and increased occurance of crime.

b. Liveability Standards in Cities, Ministry of Urban Development, GoI (2017)

The Ministry of Urban Development developed a set of 'Liveability Standards in Cities' to generate a Liveability Index and rate cities. A total of 79 indicators were prescribed in the document. These have been grouped under 15 thematic categories, which in turn are part of the four pillars of comprehensive development of cities, namely institutional, social, economic and physical.

Although safety and security indicators have been categorized under social pillar, the indicators under other pillars too play an important role in safety in public spaces.

Physical pillar focused on availability of physical infrastructure including housing, green spaces, public transportation, power supply, sanitation facilities as well as pollution level. The liveability can be closely related to safety hence each of these parameter could be linked to safety with better understanding of their impact on safety.

Economic pillar concentrated on the revenue generation, unemployment rate as well as street vending. It is interesting to see how street vendors contribute to safety. A report National Crime Prevention Council (NCPC) of Singapore in 2003 showed how street vendors act as natural surveillance contributing in maintaining safety in their environ.

Social pillar covered availability of education and health as well as safety & security. The safety & security categories include output indicators like crimes reported per year, crimes against vulnerable groups per year and accident fatality per lakh population. Institutional pillar mostly looked at governance indicators. The indicators were categorized in core and supporting indicators as well. This would help in giving weightage to each indicator.

c. Liveability Index, A CII – Institute for Competitiveness Report (2014)

The Quality of Life Index is an annual study of key factors that determine the degree of liveability of cities in India. The mission of the Index is to measure significant drivers of the health and wealth of the community that reach beyond the monetary value that drive the economy to the overall health and welfare of the residents.

The report doesn't mention the indicators in details but it gives a simple understanding of indexing and ranking. Both indexing and ranking involve the tracking of consistently measured data. Ranking, however, compares unique data sets to each other periodically, whereas indexing measures the change of comparable data sets to each other over time. It is the change factor of indexing that gives us an accurate view of our position relative to other comparable cities. Indexing is an excellent tool to monitor change and the purpose of the index is to create a set of annual studies. The index is a combination of the various indices and indicators to assess the cities on all the necessary criteria and aid future settlers to evaluate each city objectively.

A number of research papers, reports, benchmarking guidelines as well as Safetipin's previous work helped in identifying indicators to measure safety.

Picture courtesy: Safetipin

HOW TO USE THE INDEX

The index consist of 23 indicators under 4 broad categories. Each indicator is discussed from a woman safety perspective. The table for each indicator includes the following heads.

Measuring Method: This includes the variables each indicator investigates along with a calculation method. For example indicator - Streetlight Coverage has two variables. First, the total length of road having functional streetlights and second, the total length of roads in the city. The method of calculation is dividing the first with the second.

Unit: Each indicator has different variables which could have units attached to it. Thus the final output of each indicator could have a unit. For example indicator - Streetlight Coverage has two variables, both variables are calculated in kilometers, but the calculation includes percentage method to make it comparable, hence the output is in percentage.

Source of Data: The variables include demographical, geographical, as well as statistical data. To have a reliable index the data sources needs to be authentic. At times data comparable data could be sourced from different agencies. For example indicator - Streetlight Coverage, the information for variables can be gathered from Transport Authority as well as Electrical Department of the Local ULB responsible for the operation and management of streetlights. Also Safetipin data can be used to calculate coverage of streetlight in the city.

Benchmark: These indicators could have an acceptable or ideal measure set under guidelines by responsible authorities or organization. For example indicator - Streetlight Coverage doesn't have a set benchmark for coverage of streetlight. Service Level Benchmarks for Urban Transport only suggests acceptable lux quantity of streetlights. Safetipin recommends 100% of roads should have functional streetlights.

Picture courtesy: Safetipin

HOW TO USE THE INDEX

Level of Difficulty: The variables of each indicator may have primary or secondary or multiple data sources. The data available may or may not be compiled as per the units required for the measuring methods. The level of difficulty to acquire data in the form we require is stated under this head. It is divided under three categories Easy, Intermediate and Tough.

Level of Data: The indicators selected may or may not have an impact in respect to the scale of data. Some indicators could be comparable at city scale but not at the block level, whereas some could be comparable at both scales. This head defines if the indicators has to be calculated just at a city level or even at a block level. For example indicator - Streetlight Coverage, could be calculated both at the block and city level.

Picture courtesy: Safetipin

LANDUSE AND THE BUILT ENVIRONMENT

Land-use or the use of land determines the diverse socioeconomic activities that occur in a specific area, the patterns of human behaviour they produce, and their impact on the environment. Broadly these uses include, Commercial, Residential, Industrial, Institutional, Recreational as well as Open Space usage. Further, land-use planning involves the management and modification of natural environments into built environments such as human settlements and semi-natural habitats. It is the process of evaluating, assessing and regulating the use of land in an effort to promote more desirable social and environmental outcomes as well as more efficient use of resources. Goals of land use planning may include environmental conservation, restraint of urban sprawl, minimization of transport costs, prevention of land use conflicts and positive impact on community.

In urban planning, land use planning seeks to order and regulate land use in an efficient and ethical way, thus preventing land use conflicts.[4]

Similarly, built environment refers to the human-made environment that provide the setting for human activity, ranging in scale from buildings to cities and beyond. It has been defined as "the human-made space in which people live, work and recreate on a day-to-day basis."[5] The built environment encompasses places and spaces created or modified by people to serve their needs of accommodation, organisation and representation.

4. Definition retrieved from: https://en.wikipedia.org/wiki/Built_environment#cite_note-roof-1

5. Definition retrieved from: https: //en.wikipedia.org/wiki/Land-use_planning#cite_note-1

Picture courtesy: Safetipin

LANDUSE AND THE BUILT ENVIRONMENT

Together these two methods of organising human settlements, cities and urban conurbations, have visible impact on the community and its well-being. Safety in cities is such an aspect which has strong ties to the patterns of land-use and the nature of built environment and has impacted the way people live and experience cities.

Safety and security are vital elements in any urban development. Achieving a sense of personal and community safety in cities is a complex issue as the perception of safety or danger does not always relate directly to actual incidence of crime. We feel comfortable and confident using areas where there is good visibility, effective lighting and natural surveillance - where we feel we can be seen and heard by other people. Thoughtful planning and design is an important instrument in enhancing everyone's sense of well-being and in making places more safe and user-friendly.

There is ample evidence that the sensitive combination of good design, good management and community involvement is effective in creating more secure environments and of elevating the sense of safety. One of most constructive measures for safety in cities and is the creation of mixed use developments which provide lively, lived-in urban areas and public spaces providing "eyes on the street" i.e., areas which are easy to overlook and oversee.[6]

The following section on land-use and built-use has certain identified indicators which positively contribute towards safety in cities. It clearly illustrates a mechanism to measure urban safety through data sets and standards prescribed by authorities and/or agencies.

6. Jacob, Janes (1961) The Death and Life of Great American Cities

1.1 BUILT TO OPEN RATIO

Built to open ratio refers to the proportion of development blocks and/or buildings to the proportion of streets and/or open spaces which make up urban areas. It is the interrelationship and balance between all these elements, rather than their particular characteristics that bond together to make a place.

In terms of safety, cities which are tightly built are known to have a sense of safety inbuilt in them than the ones which are loosely built. For example, traditional developments like Old Delhi versus modern development like New Delhi.

This indicator looks at the proportion of buildings to open spaces.

MEASURING METHOD	UNIT
Total built area in the city / Total open area in the city = Built to Open Ratio	Ratio
SOURCE OF DATA	**BENCHMARK**
• Spatial data can be obtained from local urban body or planning authority	No Benchmark set for built to open ratio at city level. MoUD Building Bye-laws provides a ground coverage range from 77% to 33% for plot sizes from 30 sqm to 3000 sqm
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate Spatial data obtained can be analysed on GIS software to calculate built and open area	Ratio can be analysed on block as well as city level

1.2 MIXED-USE PROPORTION

Mixed-use is combination of two or more building uses like residential, commercial, cultural, institutional or industrial, where uses are physically and functionally integrated into a built form. For example traditional cities are mixed-use developments like shops on ground floor with houses built above them. When these both are combined, they compliment each other.

Some benefits of mixed use developments are proximity, socially diverse communities, feeling of safety, energy efficiency, urban vitality and active street life.

Mixed use developments significantly enhance the sense of safety and security in cities by providing 'eyes on the streets' which boosts natural surveillance. Some mixed use developments function round the clock and have people using them always. – like retail below and residences above.

This indicator looks at the percentage of mixed use developments in cities.

MEASURING METHOD	UNIT
Mixed use area / Total built area in the city x 100 = = Mixed-use percentage	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the land use plan available with the Planning or Development Authority	No Benchmark set by any planning authority. In India mixed-use land is defined under URDPFI guidelines and can be used to calculate total area under mixed-use developments
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy Existing land use plan can give accurate area under mixed built use as well as total built area of the city	City level percentage

1.3 PERMEABILITY IN BUILT AREA

Permeability of a space defines the ease of movement from one place to another. Alternative routes to reach from point A to point B gives an opportunity to choose the best and safest one. Also when spaces are more permeable with clear line of sight feeling of fear/confusion is eliminated.

The degree of permeability within an urban structure affects movement in our cities.

As defined by Marshall [1] in his paper 'Streets and patterns', 'connectivity' refers solely to the number of connections to and from a place, whereas 'permeability' refers to the capacity of those connections to carry people.

This indicator looks at the degree of permeability in cities.

MEASURING METHOD No of road/ street intersections = Total ground coverage of the city = Permeability	UNIT Number of intersection per square kilometer
SOURCE OF DATA • Data can be obtained from the land use plan available with the Planning or Development Authority • Intersection details can also made available from the Transport Department	BENCHMARK No Benchmark set by any planning authority
LEVEL OF DIFFICULTY Intermediate Land use plan can give accurate number of road intersections as well as total ground coverage of the city	LEVEL OF DATA Block level as well as city level permeability should be analysed to have an intra-city as well as inter-city comparison

1.4 GATED COMMUNITIES

Gated communities are types of plotted residential developments with perimeter boundary walls and with controlled entry/exit. Anthropologist, Setha M. Low argues that gated communities have negative effect on the net social capital of the broader community outside the gated development. A study by Blakely, E.J and M.G Snyder, 'Separate Places: crime and security in gated communities' 1998, indicates that safety in gated societies may be an illusion than reality. Gated communities in suburban areas of USA have no less crime than non-gated ones.

People living in gated communities perceive them as safer than non-gated neighbourhoods which are mostly heterogenous in nature. A gated development creates a layer of separation, wall or a barrier between the inside and outside of the society. This social, visual and physical barrier is one of reasons why cities are disjointed, routes are disrupted and walking on roads with high boundary walls makes the pedestrian feel unsafe.

This indicator looks at the percentage of gated developments in cities.

MEASURING METHOD	UNIT
Gated community area x 100 = Total municipal area = Percentage of Gated Community	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the land use plan available with the ULB, Planning or Development Authority	No Benchmark set by any planning authority
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate Spatial analysis on land use plan can be used to calculate area under gated community and total municipal area	Block level as well as city level density should be analysed to have an intra-city as well as inter-city comparison

1.5 PUBLIC PARK AND PLAZAS (OPEN SPACES)

Public parks are green open spaces set aside by the city for the purposes of public rest, play, recreation, enjoyment or assembly. Public parks provide opportunities for leisure, social interactions and builds community harmony. Cities with public parks of different scales, distributed generously within the urban fabric have shown higher levels of public participation and vibrant urban life.

Similarly, public plazas have also positively contributed towards socially engaging urban life. Parks and plazas together cater to the open space requirements of a city and the quantum, distribution and design of these could determine the degree of public usage. Well used open spaces enhances the perception of safety and security in public spaces.

This indicator looks at per capita availability of open spaces.

MEASURING METHOD	UNIT
Area under open space / Total population of the city = Per capita open space available	square/kilometre (sq. m.)
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the land use plan available with the Planning or Development Authority • Population data can be sourced from the decennial Census of India	10-12 sqm per capita Urban and Regional Development Plans Formulation and Implementation Guidelines, 2015
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	Block level as well as city level availability should be analysed to have an intra-city as well as inter-city comparison

1.6 RECREATIONAL SPACES

Recreational spaces are built spaces in cities that use geographical and recreational infrastructure for leisure purposes. Thus, every area where a phenomenon of recreation (physical, social or cultural/entertainment) takes place is a recreational space. All built functions like museums, theatres, amusement zones could be included under recreational use.

Studies show recreational spaces increase community interaction and social awareness which eventually helps in building trust within the community. These built forms being primarily of public usage, have a positive impact on the public space around them as they generate activity, boost public participation and enhance the sense of safety and security in public spaces.

This indicator looks at the percentage of area under recreation use in cities.

MEASURING METHOD	UNIT
Area under recreational use x 100 = Total municipal area = Percentage of area under recreational use	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the land use plan available with the ULB, Planning or Development Authority	12-14% small towns 18-20% medium town 20-25% metropolitan city Urban and Regional Development Plans Formulation and Implementation Guidelines, 2015
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate Spatial analysis on land use plan can be used to calculate area under recreational and total municipal area	Block level as well as city level percentage should be analysed to have an intra-city as well as inter-city comparison

Picture courtesy: Safetipin

PUBLIC INFRASTRUCTURE

Public infrastructure is infrastructure owned or available for use by the public and build and maintained by the government. It is distinguishable from private infrastructure in terms of policy, financing and purpose. It includes facilities, structures, equipment, services and institutions that are essential to the economy and quality of life of a nation, region or city, like, transport, water, sanitation, electricity, waste management, communication and public space.

Safety and security in public spaces is one of the key aspects which determine the usage of public spaces. It is closely linked to the availability and quality of public infrastructure – for example if the condition of pavements are not good, if the street lights are not functional or the transportation networks are weak – it will adversely affect the notion of safety and security in public spaces.

This section looks at the type, condition and aspect public infrastructure which impacts safety in public places like well-lit streets, accessible footpaths, robust transportation, informal businesses on streets, adequate public toilets, etc.

2.1 FOOTPATH COVERAGE

Footpath is an essential component of public infrastructure which lets pedestrians move freely in the city. Footpaths in urban spaces should be in good condition, direct and barrier-free. They need to be well-connected and overlooked by houses and other buildings.

In this indicator the availability of walkable footpath i.e. paved and unobstructed footpath which is wider or equal to 3.5 meter, is looked at.

MEASURING METHOD	UNIT
Road length with walkable footpath x 100 = Total road length = Coverage of footpath	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the records of relevant Transport Authority, Development Authority or Planning Department and verified through sample physical surveys • Safetipin Database	>=75% Service Level Benchmarks for Urban Transport, MoUD
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	Block level as well as city level percentage should be analysed to have an intra-city as well as inter-city comparison

2.2 STREETLIGHT COVERAGE

A well-lit footpath is one of the most critical factors for pedestrians to feel safe while walking on the streets after dark. In several studies conducted by Safetipin, the streetlight parameter had a high correlation with the feeling parameter i.e. poorly lit spaces were found unsafe and well-lit spaces were found to be more safe for pedestrian to walk.

Availability of streetlights alone does not ensure well-lit spaces. Streetlights should have the correct lux, should be at the correct height, direction and should not obstructed by any tree and/or permanent structure to ensure well-lit spaces.

This indicator focuses on the availability of street lights on footpaths.

MEASURING METHOD	UNIT
$\frac{\text{Road length with streetlights}}{\text{Total road length}} \times 100 =$ = Coverage of streetlight	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data can be obtained from the records of relevant Transport Authority, Development Authority or Planning Department and verified through sample physical surveys • Safetipin Database	No Benchmark set by any authority for coverage of road with streetlight. Service Level Benchmarks for Urban Transport only suggests acceptable lux quantity of streetlight. Although 100% of streets should be having streetlights.
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	Block level as well as city level percentage should be analysed to have an intra-city as well as inter-city comparison

2.3 PEDESTRIAN CROSSING FACILITIES

Pedestrians are most vulnerable while crossing the roads or streets. A pedestrian crossing or crosswalk is a place designated for pedestrians to cross most safely a road or street across the flow of vehicular traffic. Marked pedestrian crossings are often found at intersections, but may also be at other points on busy roads that would otherwise be too unsafe to cross without assistance due to vehicle numbers, speed or road widths. They are also commonly installed where large numbers of pedestrians regularly cross (such as in shopping areas) or where vulnerable road users (such as school children) regularly cross.

The crossings could be both signalised or unsignalized. Urban studies show that cities with more road/street junctions with designated pedestrian crossings are safer as they allow slower traffic speed and more pedestrian movement. Having appropriate pedestrian infrastructure can enhance the sense of safety and security in pedestrians. Hence all major roads and busy streets should be provided with crosswalks to ensure pedestrian safety while crossing them.

This indicator focuses on the percentage of street intersections with pedestrian crossing facilities.

MEASURING METHOD	UNIT
$\frac{\text{Number of intersections with pedestrian crossing facilities (PCF)}}{\text{Total length of primary \& secondary roads}} \times 100$ = Percentage of intersection with PFC	Percentage
SOURCE OF DATA	**BENCHMARK**
• Sample physical surveys can be conducted (ward-wise) to assess the availability of pedestrian facilities at junctions • Wherever available, data can be obtained from the relevant Transport Authority, Development Authority or Planning Department	No Benchmark set by any authority
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	Block level as well as city level percentage should be analysed to have an intra-city as well as inter-city comparison

2.4 STREET VENDORS AND HAWKERS

Often due to lack of designated hawking spaces, hawkers/vendors are seen as encroachers of public space. A Supreme Court ruling indicates that "if properly regulated according to the exigency of the circumstances, the small traders on the sidewalks can considerably add to the comfort and convenience of the general public, by making available ordinary articles of everyday use for a comparatively lesser price."

But it is reported that violation of the ruling is rampantly continuing because of various other complex issues like pedestrian accessibility, urban governance, law and order, etc. Street vendors if spatially organised in an appropriate way as to not cause any hindrance to pedestrian accessibility, not only would add convenience to general public but would also add 'eyes on the street' – an important natural surveillance phenomenon which makes streets and public spaces safer, reliable and liveable.

This indicator focuses on the percentage of street vendors/hawkers in the city.

MEASURING METHOD Number of street vendors/hawkers x 100 = Total population of the city = Percentage of street hawkers in the city	UNIT Percentage
SOURCE OF DATA • Street hawker registration data, ULB • National Sample Survey Office, India	BENCHMARK 2-2.5% of city population National Policy For Urban Street Vendors
LEVEL OF DIFFICULTY Intermediate Unregistered street vendors are difficult to include	LEVEL OF DATA City level percentage

2.5 EXPENDITURE ON PUBLIC INFRASTRUCTURE

74th Amendment Act also known as Nagarpalika Act of 1992, gave a lot of power to municipal bodies of India. The act transferred various responsibilities to Urban Local Bodies (ULB) which included urban planning; provision of urban amenities and facilities such as parks, gardens, playgrounds; street lighting, parking lots, bus stops and public conveniences; water supply for domestic, industrial and commercial purposes; constructing and maintaining main roads. Along with these responsibilities ULBs were also awarded shared financial powers. These responsibilities and financial powers enabled the ULBs to manage their revenue and expenditure in a better way.

Public infrastructure requires a lot of capital for its installation and maintenance. The share of budget spent on installing and maintaining public infrastructure reflects on its condition and function and together it has an impact on the safety and security of public spaces in the city.

This indicator focuses on the amount spend on public infrastructure each year.

MEASURING METHOD	UNIT
Amount spent on building and maintaining infrastructure / Total annual municipal budget x 100 = = Expenditure (annually)	Percentage
SOURCE OF DATA	**BENCHMARK**
• Budget and Expenses report of ULB and Development Authority	No data available
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate Scattered data available with different authorities	City level percentage

2.6 AVAILABILITY OF TOILETS

Open defecation is an issue India has been facing for long. Studies done by Safetipin has found that women feel more vulnerable and unsafe when they have to go out of the house to defecate or urinate whether in the open or to use public/community toilets. Women also develop severe health problems because of having no or little access to proper, functional in-house toilets.

According to UNICEF, women fear harassment or sexual violence when go out to defecate or urinate in the open. The study found that 355 million women still lack access to proper toilet facilities.

This indicator focuses on to measure the number of households with proper in-house toilet facilities.

MEASURING METHOD	UNIT
Number of households with toilets x 100 = Total number of households = Percentage of households with toilets	Percentage
SOURCE OF DATA	**BENCHMARK**
• Household Census of India • Swachh Bharat Mission Data	100%
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate Data sets available by different authorities and surveys show large gaps in the percentage coverage.	Block level as well as city level percentage should be analysed to have an intra-city as well as inter-city comparison

2.7 AVAILABILITY OF NIGHT SHELTER

According to Census 2011, India had 938,000 homeless. Similarly that year, Supreme Court Commissioner's Office estimated that 1% of urban population was homeless. This translates to 3.7 million people homeless in India. According to scheme of shelters for homeless under National Urban Livelihood Mission, there should be one shelter for every lakh population. The occupants of these shelters must be provided with basic facilities like toilets, drinking water, beddings and blankets, lockers, first-aid kits and a kitchen.

A report by Action Aid India says that most of the Indian cities lack the adequate number of night shelters and basic facilities for the homeless children, women, disabled and mentally challenged. Studies have also found that homeless women are more prone to harassment and sexual crimes than men.

This indicator focuses on the requirement of shelters and basic facilities for one of the most disadvantaged sections of the urban poor – the homeless.

MEASURING METHOD	UNIT
$\frac{\text{Total capacity of night shelters}}{\text{Total population of the city}} \times 100000 =$ = Capacity of night shelter per lakh	Capacity per lakh population
SOURCE OF DATA	**BENCHMARK**
• Census of India • Ministry of Housing & Urban Poverty Alleviation	100 per lakh population Scheme of Shelters for Urban Homeless, National Urban Livelihoods Mission (Revised Operational Guidelines)
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	City level capacity

Picture courtesy: Safetipin

PUBLIC TRANSPORTATION

Public transportation also known as public transport, public transit, or mass transit is a system of transport by a group of travel systems available for use by the general public, typically managed on a schedule and operated on established routes that charge a posted fee for each trip. Examples of public transport include city buses, trolleybuses, trams, light rails, passenger trains, rapid transit (metro/subway/underground) and ferries.

The central idea on which public transport is based on is that of an important social role - to ensure that all members of the society are able to travel, not just those with a driving license and access to an automobile and which include vulnerable groups such as women, child, elderly, disabled and the poor. Further, if public transport planning is at the core of urban planning, it will also make cities more compact and efficient. Inefficient land use, built use and transport planning complicate accessibility to essential resources and services like jobs, education, and health care.

The success of a development, town or city, depends on good access and connectivity. The measure of their success is not just their functional performance, but how they contribute to the quality of life and experience of cities, how easy it is for people to travel and the choices they have on how they travel.

Picture courtesy: Safetipin

PUBLIC TRANSPORTATION

Robust transport planning keeps all forms of movement in mind and offer people travel choices that are widely accessible and meets everyone's needs. What matters is that, wherever possible, movement on foot, by bicycle or by public transport should be as easy and convenient as using the car. This doesn't mean excluding the car: what is needed is an appropriate balance between traffic and other uses to create convenient, comfortable and safe travel options.

Hence, mass transit is the most common form of transport for people after walking or cycling. Cities in the developing world are trying to solve their transport challenges with the introduction of more mass transit, especially Bus Rapid Transit (BRT) systems or Underground Rapid Transit (Metros).

The following section on public transportation has certain identified indicators which positively contribute towards safe mobility and accessibility in cities. It clearly illustrates a mechanism to measure safe urban transport through data sets and standards prescribed by authorities and/or agencies.

3.1 COVERAGE OF PUBLIC TRANSPORT NETWORK

A well networked public transport system is critical to a liveable, prosperous and sustainable city. Mass public transport is the most space-efficient means of moving high volumes of people within the city. Cities which have build their mass transit systems extensively have financially benefitted individuals and communities alike. Sustainable city models advocate robust mass transit systems as they reduce traffic congestion, air pollution and increase fuel efficiency. They also offer safer and healthier mobility options to people.

A Safetipin study with transport providers and women commuters in three 2-tier cities in India, found that women choose their jobs on basis of public transport connectivity in order to commute safely to/from work. A well connected transport system not only increases mobility options but it also increases women's access to resources and opportunities.

This indicator focuses on measuring the coverage of public transport in the city.

MEASURING METHOD	UNIT
Length of PT/MRTS network x 100 = Total road length = Percentage of PT/MRTS coverage	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on service coverage can be obtained from the records of the relevant Transport Authority	>=100 Service Level Benchmarks for Urban Transport, MoUD
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level coverage

3.2 LAST-MILE CONNECTIVITY

The 'last-mile' or 'first and last-mile' connection is the beginning or end of an individual's trip made primarily by public transport. In many cases, people walk to transit if it is close enough. However, on either end of a public transit trip, the origin or destination may be difficult or impossible to access by a short walk. This gap from public transit to destination is termed a last mile connection. The gap is usually filled by Intermediate Public Transport (IPT) or para-transit which may have formal, informal, motorised and non-motorised transport option available as feeder services to the main public transit system.

Good last mile connectivity makes the entire public transport system seamless and increases smoother, safer and efficient transitions between different transportation systems.

Safetipin studies show having last-mile connectivity increases sense of safety in women. A prior knowledge of available transport options to reach one's final destination helps women to plan their journey better and with more confidence.

This indicator focuses on the percentage of para-transit vehicles in the city.

MEASURING METHOD	UNIT
Registered para-transit vehicles x 100 = Total population of the city = Percentage of para-transit vehicle	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on service coverage can be obtained from the records of the relevant Transport Authority	4-8% Service Level Benchmarks for Urban Transport, MoUD
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level connectivity

3.3 AVAILABILITY OF PUBLIC TRANSPORT (POPULATION)

A public transport system is inefficient if it does not have adequate fleet size to cater to the population availing that system. Indefinite waiting time at transport stops discourages people to choose that service over other transport options. Public transport which offers information on arrival time combined with good frequency, tends to be more reliable and is usually preferred by daily commuters.

In a study done with women in 2-tier cites of India, Safetipin found more than 90 percent of women don't feel safe waiting at the bus stops as they don't know when will the next bus arrive.

This indicator looks at availability of buses per 1000 population in the city.

MEASURING METHOD	UNIT
No of buses available in a day x 1000 = Total population of the city = Availability of Public Transport	Per 1000 population
SOURCE OF DATA	**BENCHMARK**
• Data on service frequency can be obtained from the records of the relevant Transport Authority	0.2-0.6 Service Level Benchmarks for Urban Transport, MoUD
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level frequency

3.4 MODAL SHARE

A modal share, also called mode-split, mode-share, or modal split, is the percentage of travellers using a particular type of transportation or number of trips made on a particular type of transportation. Modal share is an important component in developing sustainable transport within a city. Many cities have set modal share targets for balanced and sustainable transport modes, like 30% of non-motorized mode (cycling and walking) and 30% of public transport mode.

Simple put, Modal Share is the percentage of trips made on different modes of transport. Cities of different sizes have different types of modal split like, smaller towns tend to have higher percentage of people walking and cycling due to shorter distances while large cities depend more on public transportation as they need to travel longer distances.

This indicator focuses on the percentage of trips made on sustainable transport.

MEASURING METHOD	UNIT
Total trips on PT & NMT in a year x 100 = Total trips in a year = Modal Share of PT & NMT	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on service coverage can be obtained from the records of the relevant Transport Authority	1. Recommended Benchmark: 80 % trips on PT and NMT 2. PT: 10-18% in small towns, 19-30% in medium towns, 31-44 in metropolitan cities Traffic and Transportation Policies and Strategies in Urban Areas in India
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level percentage

3.5 PERCENTAGE OF FEMALE TRIPS ON PT

A trip is typically thought of having an origin, a destination, a specific mode of travel and a specific purpose. This obscures the complex patterns of linked multi-purposed trips (trip chaining), which are typical to what many women use. Trip chaining is the recognition that "trips" are often more than just origin and destinations, but a chain of related trips. They are defined by anchors, home and work, and multiple stops between the anchors. Studies have found that women make shorter and multiple trips, which often require them to change, divert, and break their journeys to pick up children, run errands, shop or take on to other family responsibilities.

They are also found to depend more on public transport, para-transits and walking. Cities like Chennai, Bangalore, Mumbai, Kolkata and Delhi have more women walking as compared to men (Census 2011). These metropolitan cities also have more women using public transport and non-motorized transport systems.

This indicator focuses on the percentage of trips made on sustainable transport by women.

MEASURING METHOD	UNIT
$\frac{\text{Total female trips on PT \& NMT in a year}}{\text{Total trips in a year}} \times 100 =$ = Female modal share of PT & NMT	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on service coverage can be obtained from the records of the relevant Transport Authority	No benchmark set by any authority Global benchmark: 40%
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level percentage

3.6 SEAT RESERVATION FOR WOMEN

Though reservation of compartments, sections and seats in public transport is a contested issue, it has been used in several countries to improve women's access and usage of public transport. In several surveys done in India and globally, women have reported feeling unsafe when travelling on public transport due to fear of harassment.

Reservation of seats for women allows them to travel with reduced anxiety and occupy the space comfortably and rightfully.

This indicator focuses on the percentage of seats reserved for women in public transport.

MEASURING METHOD	UNIT
No of seats reserved for women in PT vehicle / Total seats in PT vehicle x 100 = = Reservation for women	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on seat reservation can be obtained from the records of the relevant Transport Authority	25-33% Motor Vehicles Act ,1988
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level percentage

3.7 WOMEN EMPLOYEES IN PT FACILITY

Studies show that women feel more comfortable and safer in public spaces and while using public transport, in the presence of other women. Public transport facilities which have women employees not only contribute towards women's participation in the work force but it also very effectively represents women's voices in these facilities. Women commuters too find it easier to share their experiences with women staff in public transport. Together these factors impacts the overall perception of safety on public transport for women.

This indicator looks at the percentage share of women working in public transport facilities.

MEASURING METHOD	UNIT
No of women working in PT facility x 100 = Total employees in PT facility = Percentage of women employees in PT	Percentage
SOURCE OF DATA	**BENCHMARK**
• Data on public transport staff can be obtained from the records of the relevant Transport Authority	33.33% Many states have kept reservation for women in government jobs
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level percentage

Picture courtesy: Safetipin

SECURITY

Safety and security are of primary concern for any public space user. People expect public space to be safe and to be able to use them without any personal risk.

Security is an issue everywhere and for everyone, and particularly in public space. It is seen that the perception of security between men and women is quite different, it also varies significantly between different women of differing socio-economic status, race, age, education and cultures. People also change their opinion about the same thing according to the time of day or night.

Security is largely understood as the state of being free from danger or threat.

Although several laws are there to protect the citizens, to prevent crime and to maintain civil order - police remain an important agent to enforce law, ensure safety and provide security on ground.

The police are a constituted body of persons empowered by the state. Their lawful powers include arrest and the legitimized use of force. They are authorized to exercise the police power of that state within a defined legal or territorial area of jurisdiction.

This section focuses on the capacity of the police force as well as policing infrastructure operational in our cities

4.1.1 POLICE-PUBLIC RATIO

The national average is only 152 police personnel for every one lakh citizens, which is below the United Nations standard. According to the UN, the ratio must be 222 police officers for one lakh citizens. The ratio is highest in Singapore as the country has 600 police personnel and some countries have them between 250 and 300.

Achieving the prescribed ratio will result in greater visibility of police in public spaces which could positively impact the feeling of safety among the citizens.

This indicator looks at the ratio of police personnel to that of public in the city.

MEASURING METHOD	UNIT
Total number of Police Personnel x 100000 = Total population of the city = Police per lakh population	Per lakh population
SOURCE OF DATA	**BENCHMARK**
• National Crime Records Bureau, India • City Police Office	United Nations recommends a ratio of 222 police personnel per lakh population
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level ratio

4.1.2 POLICE-PUBLIC PROPORTION (FEMALE)

Equal proportion of women in the police force would ensure women's participation and representation within the force.

This indicator looks at the ratio of women police personnel to that of women population in the city.

MEASURING METHOD	UNIT
Total female police personnel x 100000 = Total female population of the city = Female police per lakh female population	Per lakh population
SOURCE OF DATA	**BENCHMARK**
• National Crime Records Bureau, India • City Police Office	No benchmark for female police personnel According to 33.33% of reservation for women in government jobs, 74 women police personnel per lakh population
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level ratio

4.2.1 POLICE COMPETENCY: PCR VEHICLES

Police Control Room (PCR) vehicles help in monitoring every part of the city. They function round-the-clock in the city to mark their presence, prevent incidence of crime if any and also as first responders (within five minutes) to attend to distress calls which have been received at the control room.

These actions partly establish the degree of police competency and helps in creating a sense of reliability on the forces responsible for keeping law and order in cities.

This indicator looks at the number of PCRs available for per lakh population in the city.

MEASURING METHOD	UNIT
Total number of PCR vehicles x 100000 = Total population of the city = PCR vehicles per lakh population	Per lakh population
SOURCE OF DATA	**BENCHMARK**
• National Crime Records Bureau, India • City Police Office	No benchmark set for number of vehicles per PCR or lakh population
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level capacity

4.2.2 POLICE COMPETENCY: NUMBER OF STATIONS/CHOWKIS

Another component of police infrastructure which establishes the degree of police competency is the number of police stations/posts in cities.

This indicator looks at the number of police stations/posts provided for per lakh population in the city.

MEASURING METHOD	UNIT
Total number of police station and chowkis in city x 100000 = Total population of the city = Police stations/chowkis per lakh population	Per lakh population
SOURCE OF DATA	**BENCHMARK**
• National Crime Records Bureau, India • City Police Office	One per 40,000 to 50,000 population MPD 2021 1.5 to 2 per lakh population URDPFI Guidelines, 2015
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Easy	City level capacity

4.4 CCTV SURVEILLANCE

CCTV (closed-circuit television) is a system in which live video feed of public places are monitored, primarily for surveillance and security purposes. CCTV relies on strategic placement of cameras, and observation of the camera's input on monitors placed in security control rooms.

In places, it acts as a substitute for physical security but seldom has helped in preventing crime. However, CCTV surveillance has helped police to gather evidence post crime and often acts as a deterrent for petty crimes.
This indicator looks at the percentage of CCTV coverage in the city.

MEASURING METHOD	UNIT
Number of public CCTVs x 100 = Total road length = Coverage percentage	Percentage
SOURCE OF DATA	**BENCHMARK**
• National Crime Records Bureau, India • City Police Office	No benchmark or strict laws set up for number of CCTV for public surveillance
LEVEL OF DIFFICULTY	**LEVEL OF DATA**
Intermediate	City level capacity

Picture courtesy: Safetipin

CONCLUSION

The Safe Cities Index when fully developed could be an important framework to evaluate and rank Indian cities or cities of similar nature in developing countries. Such an Index could offer an unique perspective on gender, safety and public space. Cities safety status could be measured on a comparative scale through various indicators to understand the gaps and to formulate strategies to fill those gaps.

Guidelines for an index on gender friendly cities, discussed here could be used to;

- Weigh the status of cities in terms of safety in public spaces
- Gauge individual city's strengths and weaknesses
- Evaluate cities through each and every indicator
- Highlight existing gaps between policy, planning and implementation
- Urge cities to collect gender disaggregated data in order to understand gender usage patterns

But there are certain limitations that this framework has. It currently focuses on safety in public places of Indian cities from a gender perspective and does not include other vulnerable groups. Further some data sets are not available or have not been made public for some of the indicators to build it further. Finally references on such indices for Indian cities are inadequate.

Nonetheless, cities need more indices of such type to be formulated in order to measure and compare our cities better from numerous perspectives. With the majority of the world's population now living in cities, there is a great deal at stake in the measurement (or mismeasurement) of quality of life. Cities are striving to address multiple challenges: social cohesion, environmental sustainability, affordability and economic prosperity. Fixing the gaps in safety indicators will be one small victory in a much larger battle to measure progress, in a way that benefits all citizens. [7]

7. McArthur, Jenny & Moonen, Tim (April 2019) Why we need a holistic way to measure the planet's most 'liveable cities' Retrieved from: https://www.weforum.org/agenda/2019/04/liveable-cities-rankings-how-a-global-enterprise-is-influencing-urban-change

Picture courtesy: Safetipin

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Picture courtesy: Safetipin

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Safetipin is a technology platform that uses apps to collect data in order to make cities and public spaces safer and more inclusive for women. Safetipin works with city governments to use data for improvement, and specific initiatives to address women safety in public spaces.