



# Women's Access and Mobility Plan for Cities in Bihar: Recommendations

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## Abbreviations

ADB	Asian Development Bank
BCC	Behavioral Chance Communication
BRTS	Bus Rapid Transit System
BSNL	Bharat Sanchar Nigam Limited
BSRDC	Bihar State Road Development Corporation
BSRTC	Bihar State Road Transport Corporation
BUIDCO	Bihar Urban Infrastructure Development Corporation
BUTSL	Bihar Urban Transport Services Limited
CAGR	Compound Annual Growth Rate
CCTV	Closed Circuit Television
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CLF	Cluster Level Federations
CMP	Comprehensive Mobility Plans
DIMTS	Delhi Integrated Multi-Modal Transit System
DNT	Developed area near public transport
DTO	District Transport Office
EWT	Excess Wait Time
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMC	Gaya Municipal Corporation
GoB	Government of Bihar
GPS	Global Positioning System
GUA	Gaya Urban Agglomeration
GWAF	Graduate Welfare Association Fazilka
HH	Household
HKSAR	Hong Kong Special Administrative Region
ICT	Information and Communication Technology
IPT	Intermediate Public Transit
KMRL	Kochi Metro-rail Limited
LBSL	London Bus Services Limited
LFPR	Labour Force Participation Rate
MC	Municipal Corporation
MGI	McKinsey Global Institute
MMC	Muzaffarpur Municipal Corporation
MoHUA	Ministry of Housing and Urban Affairs
MoRTH	Ministry of Road Transport & Highways
MoSPI	Ministry of Statistics and Programme Implementation
MUA	Muzaffarpur Urban Agglomeration
NA	Not Applicable
NIUA	National Institute of Urban Affairs
NGO	Non-Government Organisation
NMT	Non-Motorized Transport
NMV	Non-Motorized Vehicles
PMC	Patna Municipal Corporation
PNB	Punjab National Bank
PRC	People's Republic of China
PUA	Patna Urban Agglomeration
QIC	Quality Incentive Contract
ROA	Road Owning Agency





RTA	Road Transport Authority
RTO	Regional Transport Office
SHG	Self-Help Group
SOP	Standard Operating Procedure
STA	State Transport Authority
SUMP	Sustainable Urban Mobility Plans
TARC	Transport Authority of River City
TfL	Transport for London
UA	Urban Agglomeration
UDHD	Urban Development and Housing Department
UIT	Urban Improvement Trust
UN	United Nations
USA	United States of America
USD	United States Dollar
VO	Village Organizations
WMATC	Washington Metropolitan Area Transit Authority

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## Summary of findings

The sample survey of 1947 respondents across three cities of Bihar was conducted between January-March 2020, focusing on those in the prime working age group of 18-49 years. Female and male respondents account for equal shares of the sample, with 49.9 and 50.1 percent.

### Women have moved to the current city of residence for education, work or marriage

Twice the number of women have lived in the current city for less than 10 years, as compared to men, indicating that women may have migrated to the current city of residence for education, work or marriage as compared to men, who are more likely to have been born in the city.

### A self-employed work force with long hours and days, and 62 percent of women are homemakers

The gender disparity in education stands out with women more likely not to have a formal education, and lower access to vocational and higher education, and especially a college degree (-15 percent).

One-fifth of the total respondents are students and close to one-third of all respondents identified as homemakers. Self-employed persons are 1.5 times the number of employed persons and include rickshaw drivers (both electric and otherwise), wage labourers, shopkeepers and street vendors. Men are the chief wage earners for 96 percent of the households.

Even though the sample belongs to the prime working age group (18-49 years), there is a gender employment gap of 50 percentage points between men and women. The ratio of women engaged in paid work to men is 1:4 (19 percent of women are engaged in paid work as compared to 70 percent of men). Homemakers account for 62 percent of female respondents, and women work as tailors, domestic workers, vegetable vendors, teachers, home-based workers making mosquito nets, in beauty parlours, grocery stores.

The median number of working days is 6 with and close to 40 percent working all seven days of the week. The median number of hours engaged in paid work is 8, with one-third of the respondents working for more than 8 hours per day. A higher share of women than men are engaged in part-time paid work with a fifth of women spending 4 hours or less compared to only 3 percent of men.

44 percent of respondents each commute for work as well as partially commute and work from home. This is due to the large number of self-employed persons and employed persons who may also run their own business from home. 22 percent of women work from home in these 3 cities as compared to 55 percent in urban Bihar. Similarly, only 9 percent of the men work from home in these 3 cities compared to 31 percent in urban Bihar.

### Working women spend 4 hours per day on household and care work compared to 1 hour by working men

Women bear most of the burden of household and care work. Working women spend an average of 4 hours per day on household and care work compared to 1 hour by working men. The gender disparity is also observed amongst students, as female students spend twice the time (median = 2.0 hours) on household work as compared to male students (median = 1 hours). Further, close to half the male (49 percent) and two-thirds of the female (65 percent) respondents reported that they are supported by other female members of the household. This could be a major factor in limiting women's full participation in the work force.

### Working women earn 25-50 percent lesser than working men

At the household level, median income range is reported to be between Rs 10,001 and 20,000. The median income for working women is in the range of Rs 7501-10,000 as compared to Rs 10,001-20,000 for men. The gender disparity in education, fewer hours of paid remunerative work along with





bearing a major burden of household and care work, could explain some of the income gaps between women and men.

#### **Ownership of transportation assets**

Only 10 percent of the households own a car, whereas 74 percent of the households own a two-wheeler and 47 percent own a cycle. The mean vehicle ownership is 1.48 per household.

#### **Gender gap in riding bicycles is 62 percent**

The gender gap in knowing how to cycle is 62 percentage points, with only 32 percent of women knowing how to ride a bicycle. However, a higher proportion of women in Gaya (40 percent) know how to cycle compared to Muzaffarpur (33 percent) and Patna (30 percent). Even though Bihar is one of the states with a strong cycling culture and with existing schemes and leadership to encourage girl students to take up cycling, this figure still shows the scale of the challenge ahead in promoting cycling amongst urban women.

#### **35 percent of women do not own a smart phone**

98 percent of the respondents own a phone, with three-fourths owning a smartphone. However, women are twice as likely as men to own a basic phone with a gender differential gap of 19 percentage points in the possession of smartphones. Therefore, any mobility focused ICT intervention such as real time information of public transport, QR code payments will need to cater to basic phones and smart phones.

#### **Women travel less than men**

Contrary to global travel trends, where women travel more frequently than men, women in urban Bihar make 37% fewer trips per day. Women's per capita trip rate is 1.28 compared to 1.75 for men.

#### **82 percent of women's trips are for non-work-related purposes**

For women, non-work trips constitute 82 percent of their travel in cities. Therefore, conventional mobility services planning based on only work and education trips will exclude around 40 percent of all trips in urban areas of Bihar, and most of women's trips (62 percent) –erasing women's care-related and other travel.

#### **87 percent of women's trips are by walking (57 percent) and shared IPT (30 percent)**

A sex disaggregated analysis across the three cities reveals that 57 percent of women's trips are by walking and 30 percent are by shared intermediate public transport (IPT). Women make 1.6 times or 60 percent more walk trips than men, and 1.5 times or 50 percent more trips by shared intermediate public transport.





## Recommendations

Patna is the largest city in Bihar with an estimated population of 2.21 million (2021). Gaya is the second largest city with a population of 0.58 million (2021) and Muzaffarpur is the third largest city with a population of 0.51 million (2021). Therefore, a graded approach to improving urban mobility needs to be adopted, focusing on Patna separately from Gaya and Muzaffarpur.

There is an overwhelming demand for improved services as more than four-fifth of the respondents are willing to use sustainable modes of transport if they are provided with improved services. Shared intermediate public transport is the most preferred mode (93 percent), followed by walking (85 percent), public buses (84 percent) and private buses (82 percent), with sharp differences by sex.

### 1. Women's access and mobility plans

Mobility plans do not report travel behaviour by sex, count household, purchase and care trips or women's mobility of care, or measure the level and extent of sexual harassment and tend to undercount walking trips. These have disproportionate implications for women, whose mobility and experience of commuting is made invisible, thereby creating gender-blind transport systems. Therefore, travel surveys should specifically:

- Include household, purchase and care work as a travel purpose. Shopping trips are often also disguised household-related purchase trips.
- Measure the frequency, nature and place of sexual harassment, as well as individual and bystander response. This can help in creating strategies to improve women's perception and experience of safety on streets and in public transport.
- Count walk trips, including first and last mile connectivity to bus stops, shared IPT.
- Report all travel behaviour by sex to understand the women's inequity in transportation.

Sustainable Urban Mobility Plans (SUMP) and Comprehensive Mobility Plans (CMP) should have a cross-cutting and a dedicated focus on improving women's access and mobility with gender responsive mobility indicators to monitor outcomes and outputs.

### 2. Improve the walking environment in urban areas of Bihar

Transport investments in urban areas of Bihar need to prioritize safe walking and cycling environments. This can be done by:

- Creating a state-level *Safer Streets, Safer Cities for Women* program with the goal of redesigning streets to make them safe, comfortable and inviting for women and girls. The program can be initiated in the cities of Patna, Gaya and Muzaffarpur.
- Adopting *Safer Streets, Safer Cities* guidelines to steer existing initiatives under the Smart Cities and AMRUT missions and future proposals. The guidelines include sections on (i) improving the street network and integrating it with land-uses; (ii) street elements, behaviour change messages, advertisements from a gender perspective and the role of the Police; (iii) street design and intersection templates; and a (iv) street design process that mainstreams women's access.

### 3. Increase the supply of buses in urban areas of Bihar

Currently, urban areas in Bihar have 1 bus per 100,000 persons compared to the estimated requirement of 40-60 buses by MoHUA. The recommendations include the following:

- A mix of standard, midi and mini-buses in Patna, and mini-buses in smaller cities due to the constrained right of way. While the private sector may operate and maintain the buses and the bus terminals, the Government of Bihar will need to make investments in urban buses. With private sector operations, gross cost contracts with viability gap funding (VGF) are recommended with gender responsive service standards for bus specifications, operations, driver and conductor behaviour and responsiveness.
- Institutional framework for operating city bus services in Bihar with the revival of the BUTSL and creating a dedicated urban bus company within the Patna Municipal Corporation.

#### 4. Improve the quality of shared IPT services

The shared tempos cater to longer trip distances compared to the smaller auto-rickshaws and e-rickshaws. While permitted to carry 3 passengers (excluding the driver), these Tempos are modified to carry around 10 passengers. 76 percent of the respondents rated IPT services as poor or worse. Overcrowding, ad-hoc prices and rash driving are major concerns. Close to three-fourths of the respondents have stated that reduced overcrowding will have a higher impact on IPT services, followed by safe driving (64 percent) and better design (61 percent) for protection from extreme weather.

E-rickshaws are the preferred mode of IPT for close to half of all respondents, and especially women. This is due to the limited scope of overcrowding in the e-rickshaws, visibility, openness and frequent service. The average trip distances of e-rickshaws for work and education purposes is 3.3-3.6km.

- The introduction of city bus services is likely to increase competition for the Tempos, and they may oppose the bus services. Learning from cities in Latin America, the registered Tempo operators can be provided employment in the city bus services.
- Simultaneously, tempo operators can be encouraged to organize into cooperative societies or federations to transition to cleaner fuels (BSVI or electric vehicles) and provide improved services.
- Create awareness amongst male operators on women's patronage of shared IPT services and standard operating procedures on how to address harassment in rickshaws.
- Encourage and incentivize the registration of e-rickshaws with women operators. Even though, only 38 percent of the respondents prioritized women operators, these can also increase livelihood opportunities for women, within the proximity of their homes. Individual operators (e.g. Vahinis in Allahabad and recently in Delhi) or a fleet-based model (e.g. Chennai) can be explored.

#### 5. Conduct awareness and behaviour change campaigns

Close to one-fourth of the female respondents have faced harassment while commuting, with a wide variation across the cities of Muzaffarpur (44 percent), Gaya (25 percent) and Patna (16 percent). This appears counterintuitive when compared to cities like Delhi and Bengaluru, which have reported high rates of harassment. This indicates that harassment is normalized to a larger extent in the cities of Bihar.

Additionally, only 11 percent stated that they had foregone work or educational opportunities (compared to 26 percent of men). Overall, women may have internalized patriarchal gender roles and have a lower expectation of services, highlighting the need for awareness campaigns on demanding for quality transportation services.

An advocacy and behaviour change campaign for safe mobility and increasing awareness amongst female and male passengers, bystanders, public transport personnel and shared IPT operators is recommended. The campaign can encourage women to raise their voice when faced with harassment and sensitize bystanders in assisting women. The campaigns could specifically target staring, lewd comments and stalking faced on the streets, bus stops, inside buses and rickshaws.

#### 6. Institutional framework, roles and responsibilities of government organizations

The Transport Department, Urban Development and Housing Department and urban local bodies will be the implementing agencies for the above recommendations. A coordinating cell such as a Women's Mobility and Access Cell is recommended, which can be the nodal agency for coordinating between the departments, monitoring progress and organizing technical and non-technical capacity development trainings.



## 1. Introduction

There is increasing evidence globally, that women's participation in the paid economy can boost economic growth, agency and empowerment. According to a study by McKinsey Global Institute, gender parity could add USD 12 trillion to the global GDP by 2025. India could increase its GDP by USD 0.7 trillion in 2025, with 70 percent coming from increasing women's labour force participation by 10 percentage points. This would bring 68 million more women into the paid economy (MGI 2015). Women's paid employment can also increase their personal agency and status within the home and outside (Dollar and Gatti 1999, Loko and Diouf 2009).

According to the data from the Periodic Labour Force Survey (PLFS) 2017-18, Bihar registered the lowest female labour force participation (LFPR) in the country. Only 4.4 percent of women of working age<sup>1</sup> in Bihar were in the labour force in 2017-18. While only 11 percent of Bihar's population resides in urban areas, the female LFPR was higher in urban areas (6.9 percent) than in rural areas (4.1 percent) (MoSPI 2018).

Evidence from multiple studies across India and globally have revealed that the performance of urban transport services places different burdens on women and men, with the costs of poor public transport often being borne by women. For example, women may turn down better employment opportunities further away from home in favor of lower-paid local opportunities when the public transport system is unreliable or unaffordable (ADB 2013). Safe, affordable, comfortable, convenient and reliable transport can play an important role in helping meet women's practical needs and contribute to their strategic empowerment (Shah, et al. 2017). **The aim of this study is to identify the transportation barriers and obstacles faced by women in urban areas of Bihar and provide policy recommendations to enable access to education and employment opportunities.**

## 2. Structure of the study

The overall study is structured in 4 stages:

1. **Inception stage** presents the socio-economic profile at the district and urban agglomerations, institutional framework for urban transport, policy analysis at the state levels to understand government priorities towards sustainable transport and outlines a methodology for the rest of the study.
2. **Gender assessment of transportation in Patna** will draw upon sex-segregated travel surveys in Patna urban agglomeration, focus group discussions with women, intermediate public transport service providers, bus conductors and drivers and rapid infrastructure assessment.
3. **Gender assessment of transportation in Gaya and Muzaffarpur** will draw upon sex-segregated travel surveys in Gaya and Muzaffarpur, focus group discussions with women, intermediate public transport service providers, bus conductors and drivers.
4. **Recommendations** stage will involve creating a plan to improve women's access and mobility in urban areas of Bihar, with a focus on Patna, Gaya and Muzaffarpur.

This report focuses on stage 4.

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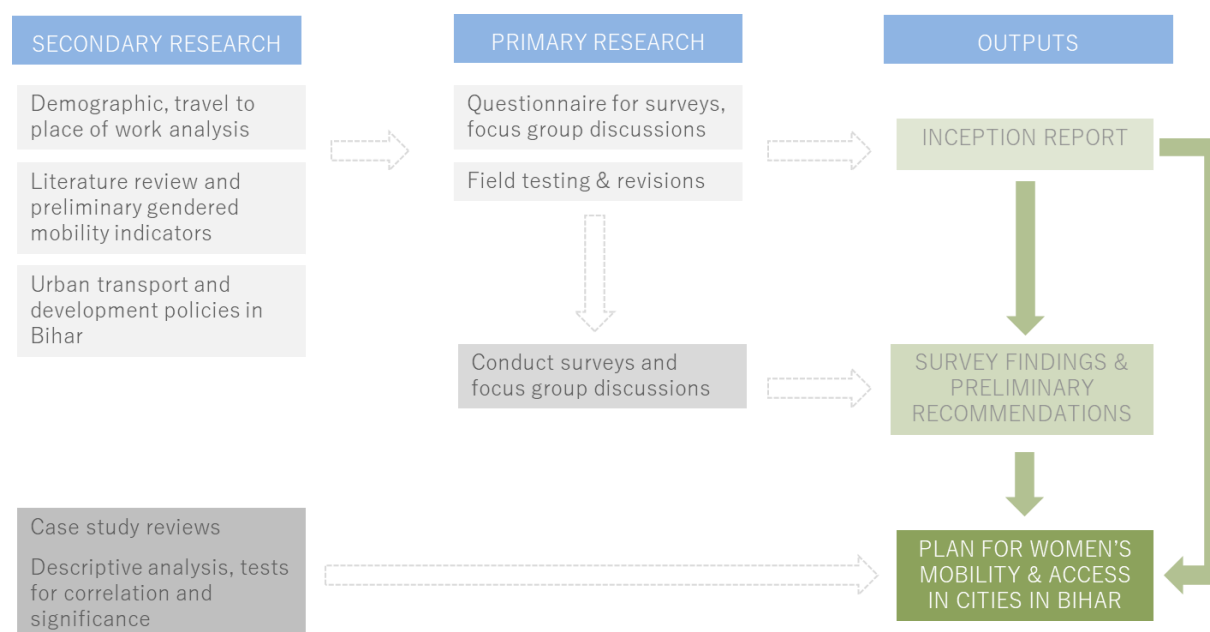
<sup>1</sup> Age group of 15-59 years.



### 3. Methodology

The methodology of the study includes primary research, secondary research and 3 outputs which culminate in the Women's Access and Mobility Plan for cities in Bihar.

Figure 1: Methodology of the study



### 4. Approach

Global literature has focused on the Enable-Avoid-Shift-Improve approach for driving action towards environmentally sustainable transportation. However, from a gender perspective in cities in India and in Bihar, it is important to *retain* existing non-motorized transportation mode shares and simultaneously shift towards public transportation. Finally, the technology transition to low or zero emission fuel and vehicles, needs to include improving the quality of service in shared IPT. Therefore, the framework includes the following actions.

Table 1: Enable-Avoid-Retain-Shift-Improve

Enable	Avoid	Retain & Shift	Improve
Enabling governance framework	Avoid motorized travel	Retain non-motorized trips Shift to public transport	Improve the quality of shared intermediate public transport



## 5. Urban growth in Bihar

The urban population in Bihar grew from 6.48 million to 8.65 million between 1991-2001 at a CAGR of 2.93%. Between 2001-11, it grew to 11.75 million at a CAGR of 3.12%. If urban Bihar continues to grow at the same CAGR, its population is expected to grow to 15.98 million (2021) and 21.72 million by 2031. By 2031, the population of the urban agglomerations of Patna, Gaya and Muzaffarpur are expected to grow to 2.98 million, 780,000 and 652,000, respectively.

While the study was conducted for the municipal corporations of Patna, Gaya and Muzaffarpur, it is recommended that the urban agglomeration be planned for since the peripheries of these cities are witnessing higher growth. Urban bus services in Patna already cater to areas like Danapur and Khagaul, which are outside the PMC boundary.

Table 2: Population and CAGR in Bihar, Patna, Gaya and Muzaffarpur

	1,991	2,001	2,011	CAGR (2001-2011)	2021	2025	2031
Urban Bihar	6,482,017	8,651,678	11,758,016	3.12%	15,979,668	18,065,968	21,717,081
Municipal Corporations							
Patna MC	956,417	1,432,209	1,684,297	1.63%	1,980,756	2,113,469	2,329,395
Gaya MC	291,675	389,192	474,093	1.99%	577,515	624,947	703,498
Muzaffarpur MC	241,107	305,525	354,462	1.50%	411,237	436,417	477,107
Urban agglomerations							
Patna UA	1,140,100	1,697,976	2,049,156	1.90%	2,472,968	2,666,097	2,984,434
Gaya UA	291,675	394,945	475,987	2.48%	608,055	670,629	776,767
Muzaffarpur UA	241,107	305,525	396,590	2.52%	508,637	561,868	652,340



## 6. Gender responsive mobility indicators

The mobility indicators are created assuming the base year as 2020 and the horizon year as 2031. Outcome and output indicators are adapted from the transport service level benchmarks created by MOHUA and secondary literature.

Table 3: Outcome indicators for women's access and mobility plans

Indicator	Measure	Existing situation	Recommended Benchmarks
1 Developed area near public transport (DNT)	Built-up area within 500m distance of public transport <sup>2</sup>	Patna: 48% Gaya: 84% Muzaffarpur: 82%	Developed area near frequent transit: Patna: At least 80 percent Gaya & Muzaffarpur: Current levels are retained
2 Mode shares	Percentage of walking, cycling, public transport, intermediate public transport by women	<p>All trips</p> <p><b>Patna</b></p> <ul style="list-style-type: none"> <li>Overall: 72%</li> <li>Women: 55%</li> </ul> <p><b>Gaya</b></p> <ul style="list-style-type: none"> <li>Overall: 76%</li> <li>Women: 54%</li> </ul> <p><b>Muzaffarpur</b></p> <ul style="list-style-type: none"> <li>Overall: 69%</li> <li>Women: 47%</li> </ul> <p>Share of public and intermediate public transport trips in motorized trips</p> <p><b>Patna</b></p> <ul style="list-style-type: none"> <li>Overall: 49%</li> <li>Women: 53%</li> </ul> <p><b>Gaya</b></p> <ul style="list-style-type: none"> <li>Overall: 46%</li> <li>Women: 58%</li> </ul> <p><b>Muzaffarpur</b></p> <ul style="list-style-type: none"> <li>Overall: 28%</li> <li>Women: 70%</li> </ul>	<p>At least 80% of all trips in each city are by non-motorized transport, public transport, and intermediate public transport</p> <p>Women constitute 55% of all trips by non-motorized transport, public and shared IPT</p> <p>Public and intermediate public transport trips constitute 65% of motorized trips in Patna, 60% in Gaya and 50% in Muzaffarpur</p> <p>Women's share of public transport and intermediate public transport trips are retained or increased</p>
3 Walking time	Women's travel time for work, education, household, care and purchases, by walking	<ul style="list-style-type: none"> <li>Women's travel time, by walking is more than 15 minutes: 18%</li> </ul>	Women's travel time for walking trips more than 15 minutes reduces
4 Cost on transport per month	Household monthly expenditure on transport is less than 5%	78% across three cities	Share of households with less than 5% monthly expenditure on transport remains the same or reduces
5 Sexual harassment faced	Women's experience of sexual harassment on streets	<ul style="list-style-type: none"> <li>Patna: 72%</li> <li>Gaya: 83%</li> <li>Muzaffarpur: 67%</li> </ul>	Women's experience of sexual harassment on streets reduces

<sup>2</sup> BSRTC buses in Patna and Tempos in Gaya and Muzaffarpur. The frequency of public transport is important and should be included upon availability of data.





## 6.1 Street network and non-motorized transport

These indicators aim to evaluate the street network connectivity, quality of footpaths, lighting, spaces allocated for street vendors, availability of public toilets for women.

Table 4: Indicators for street network and infrastructure

Indicator	Definition	Existing Situation	Recommended Benchmarks	
Street Network				
1	Median block perimeter	Median block perimeter bounded by publicly accessible roads on all sides	Block perimeter within the city centre Patna: 1,760m Gaya: 2,457m Muzaffarpur: 2,210m	Block perimeter: 400-600m
Street Infrastructure				
2*	Pedestrian-oriented streets	Major and intermediate streets have well-maintained footpaths and safe crossings	Patna: 8% Gaya: 7% Muzaffarpur: 2%	All major and intermediate streets have well-maintained footpaths
3	Traffic-calmed local streets	Local streets with design speeds less than 20kmph		At least 80 per cent of local streets
4*	Well-lit streets	Streets have uniform and consistent lighting	Patna: 67%** Gaya: 59%** Muzaffarpur: 57%**	Entire street network
5	Perception of safety in the night	Women's perception of streets as good or very good in the night	<ul style="list-style-type: none"><li>Women: 9%</li></ul>	At least 80% of women rate the streets as good and very good in the night
6	Streets with safe cycling infrastructure and crossings	Percentage of streets greater than 24m with cycle tracks	Overall: 0 Patna: 0 Gaya: 0 Muzaffarpur: 0	All streets with more than 24m right of way

Source: Adapted from (Shah, et al. 2017)

\* Data from Safetipin

\*\* Includes major and intermediate streets



## 6.2 Intra-city public transport

The public transport output indicators evaluate the availability, crowd, perception and quality of bus travel, which includes the infrastructure, vehicles.

Table 5: Indicators for public transport

Indicator	Measure	Existing situation	Recommended Benchmarks
<b>Public transport</b>			
<b>Overall System</b>			
1	Perception of public bus travel, by sex	Rating of public buses as 3 or more on a scale of 1-4 (1: Very Poor; 4: Very Good) Patna Overall: 15% Women: 19%	At least 80 per cent of women
2	Perception of private bus travel, by sex	Rating of private buses as 3 or more on a scale of 1-4 (1: Very Poor; 4: Very Good) Patna: Overall: 12% Women: 14%	At least 80 per cent of women
<b>Infrastructure</b>			
3	Universally accessible, bus shelters	Percentage of sheltered, well-lit bus stops with transparent back panels, seating Patna: 0 Gaya: 0 Muzaffarpur: 0	All bus stops
4	Information and communication	Percentage of bus stops with real time information, route maps, functional help line numbers and emergency numbers Patna: 0 Gaya: 0 Muzaffarpur: 0	All bus stops
<b>Vehicles</b>			
5	Availability of intra-city urban bus services	Number of equivalent standard buses per lakh population in the city. Bihar: 0.01 Patna: 5.50 Gaya: 0 Muzaffarpur: 0	At least 60 buses per lakh population
6	Load factor of the bus	Passengers per bus per day Data is unavailable	700-800 passengers per bus per day <sup>3</sup>
7	Public transport fleet as per Urban Bus Specifications II	Percentage of the public transport fleet with space for persons on wheelchairs and strollers, lower grab bars, minimum 700mm gangway, doors with a clear width of at least 1000mm, transparent windows Patna: 0 Gaya: 0 Muzaffarpur: 0	Entire public transport fleet of standard buses (of which at least 10 percent of the public transport fleet has a low floor with access ramps)
8	Information and	Percentage of public Patna: 0	Entire public transport fleet

<sup>3</sup> For a 40-seater bus.



communication	transport fleet with route maps, functional help line numbers and emergency numbers and real time information	Gaya: 0 Muzaffarpur: 0
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Source: Adapted from (Shah, et al. 2017)

### 6.3 Intermediate public transport

Since intermediate public transport is the backbone of public transport in the city, the indicators assess the perception of travel in rickshaws, their infrastructure, vehicle condition and driver behaviour.

Table 6: Indicators for intermediate public transport

Indicator	Measure	Existing situation	Recommended Benchmarks
<b>Overall Journey</b>			
<b>1</b> Perception of the intermediate public transport journey, disaggregated by sex	Rating of shared IPT as 3 or more on a scale of 1-4 (1: Very Poor; 4: Very Good)	Bihar <ul style="list-style-type: none"> <li>• Overall: 24%</li> <li>• Women: 36%</li> </ul> Patna <ul style="list-style-type: none"> <li>• Overall: 28%</li> <li>• Women: 40%</li> </ul> Gaya <ul style="list-style-type: none"> <li>• Overall: 5%</li> <li>• Women: 10%</li> </ul> Muzaffarpur <ul style="list-style-type: none"> <li>• Overall: 28%</li> <li>• Women: 47%</li> </ul>	At least 80 per cent of women
<b>IPT Infrastructure</b>			
<b>2</b> Sheltered and safe stands	Percentage of sheltered stands with lighting of 30-40 lux and route information	Patna: 0 Gaya: 0 Muzaffarpur: 0	All stands
<b>IPT Vehicles and Drivers</b>			
<b>3</b> Intermediate public transport fleet	Percentage of a well-maintained, clean intermediate public transport fleet with GPS devices, functional help line and emergency numbers and name and photograph of the driver published inside and outside the vehicle. The route maps must be shown where applicable (as in the case of auto-rickshaws etc.)	Patna: 0 Gaya: 0 Muzaffarpur: 0	Entire intermediate public transport fleet
<b>4</b> Perception of overcrowding*	Percentage of passengers, by sex who perceive that vehicles are overcrowded	Bihar <ul style="list-style-type: none"> <li>• Overall: 52%</li> <li>• Women: 45%</li> </ul> Patna <ul style="list-style-type: none"> <li>• Overall: 50%</li> </ul>	Less than 20 percent of passengers and women perceive that the vehicles are overcrowded





		<ul style="list-style-type: none"> <li>• Women: 46%</li> </ul> Gaya <ul style="list-style-type: none"> <li>• Overall: 76%</li> <li>• Women: 64%</li> </ul> Muzaffarpur <ul style="list-style-type: none"> <li>• Overall: 32%</li> <li>• Women: 21%</li> </ul>	
5	Perception of driver behaviour	Percentage of passengers, by sex who perceive that the vehicle is driven rashly  Bihar <ul style="list-style-type: none"> <li>• Overall: 42%</li> <li>• Women: 44%</li> </ul> Patna <ul style="list-style-type: none"> <li>• Overall: 42%</li> <li>• Women: 45%</li> </ul> Gaya <ul style="list-style-type: none"> <li>• Overall: 51%</li> <li>• Women: 54%</li> </ul> Muzaffarpur <ul style="list-style-type: none"> <li>• Overall: 34%</li> <li>• Women: 28%</li> </ul>	Less than 20 percent of passengers, and women perceive that the vehicle is driven rashly

Source: Adapted from (Shah, et al. 2017)

\* This can be replaced with average number of passengers in the peak hours upon data availability

## 6.4 Implementation framework

The UDHD can become the nodal department for adopting the gendered mobility indicators and ensuring that these are incorporated within the comprehensive mobility plans under preparation in the 11 cities in Bihar. Alternatively, the UDHD can launch a specific program focused on improving women's access and mobility in cities in Bihar in partnership with the WDC.





## 7. Guidelines for streets in urban areas of Bihar

*Safer Streets, Safer Cities* street design guidelines are proposed to mainstream women's mobility and accessibility. The guidelines are based on the principles of efficiency, universal accessibility, safety and security, environment sustainability and women's mobility and proximity of care.

### 7.1 Implementation framework

The guidelines can be adopted by the Government of Bihar, and specifically UDHD and PWD at the state level, and urban local bodies at the city-levels. A street design cell is recommended within the road owning agencies to monitor and implement street design projects oriented towards sustainability.



## 8. Increase the supply and quality of city bus services

Currently, BSRTC is operating 110 buses in Patna. It has a total fleet of 223 buses, all of which have an average age of 12.85 years in March 2015-16. Currently 2,369 equivalent standard buses are required in the urban agglomerations of Patna, Gaya and Muzaffarpur, assuming 60 buses per lakh population and 95% fleet utilization. The bus fleet and the type of buses can be rationalized based on the city size, and upon preparing a public transportation plan. The estimated capital cost for the buses and depots is Rs 1,535 crores (2031), excluding bus terminals and shelters.

Table 7: Standard equivalent buses required in cities in Bihar

Region	2021	2025	2031
Patna	1,558	1,680	1,880
Gaya	383	422	489
Muzaffarpur	320	354	411
<b>Total</b>	<b>2,261</b>	<b>2,456</b>	<b>2,791</b>

Table 8: Depots required in cities in Bihar

Region	2021	2025	2031
Patna	16	17	19
Gaya	4	4	5
Muzaffarpur	3	4	4
<b>Total</b>	<b>23</b>	<b>25</b>	<b>28</b>

Table 9: Terminals required in cities in Bihar

Region	2021	2025	2031
Patna	12	13	15
Gaya	3	3	4
Muzaffarpur	3	3	3
<b>Total</b>	<b>18</b>	<b>20</b>	<b>22</b>

There are multiple models by which city bus services are operated. The buses can be operated by the state or the city transport undertaking as in cities like Mumbai and Bengaluru, or buses can be leased by the private sector and operated on a gross cost contract (DIMTS, Janmarg), quality incentive contracts (London, Annexure 1) or a net cost contract (such as Bhopal, Indore and Hong Kong SAR, Annexure 2). Currently, the RTA auctions routes on an annual basis to private operators with a minimum 7% "fee" to be paid to the RTA. This is being reviewed with the following conditions to allocate 3-year contracts and that the buses are not be more than 7 years old. It is recommended that the Government of Bihar invest in intra-city buses and the depots, whereas the private sector can operate the buses on a gross cost contract with viability gap funding (VGF) and build, operate the terminals and transfer after a predetermined period.

The findings from the study along with a review of domestic and international contracts highlights the need for establishing a dedicated city bus authority in Patna and revitalizing BUTSL for urban public transport services in other cities in Bihar. The role of the authority/ BUTSL will be to prepare an integrated public transportation plan (including shared IPT) for the city, identify routes, establish service standards for operation and monitor performance of bus services. Longer duration contracts of 5-7 years are recommended, and recommended service quality standards are described below.

Table 10: Recommended service quality standards in bus operations

SNo	Performance indicator	Service quality standards
1	Cleanliness	1. Bus body is washed at least once a day 2. Bus floors are swept after every return journey
2	Information	3. Route maps, stickers with emergency and helpline numbers, behaviour change information are intact and visibly displayed





		4. Estimated time of arrival of the next stop and name
3	Bus fleet and operations	5. Urban bus specifications II with space for persons on wheelchairs and strollers, lower grab bars, minimum 700mm gangway, doors with a clear width of at least 1000mm, transparent windows 6. Operational bus fleet (versus the scheduled bus fleet) 7. Operational kilometres 8. 0 bus stops skipped
4	Training programs for bus drivers and conductors	9. Percentage of bus drivers and conductors who receive training on customer behaviour, gender sensitization and safe driving before beginning operations 10. 95% of bus drivers participate in at least one customer behaviour, gender sensitization and safe driving training session every 6 months 11. 95% of bus conductors participate in at least one customer behaviour, gender sensitization training session every 6 months
5	Complaints	12. The maximum response time for a complaint should be 10 days (For complex cases, the response period can be extendable to 1 month)
6	CCTV cameras	13. Functional CCTV cameras inside the bus

## 8.1 Implementation framework

The BUTSL (and PUBC) will be responsible for preparing the integrated public transportation plans for cities, monitoring performance of bus services. BUIDCO can become the nodal agency for procurement of buses (as in the JnNURM) and developing the bus depots. The terminals can be developed by the private sector, whereas the curriculum and manuals for gender sensitization trainings can be prepared by the WDC in coordination with BUTSL.

Table 11: Stakeholder responsibilities

Recommendation	Stakeholder
Integrated public transportation plan for Patna and other cities in Bihar	PUBC, BUTSL
Procurement of buses	BUIDCO
Development of bus depots	BUIDCO, BSRTC
Development of terminals and bus stops	BUIDCO, MC, private sector
Curriculum and manual for gender sensitization training programs for bus personnel	WDC in coordination with BUTSL



## 9. Improve the quality of shared IPT services

In addition to increasing public transport provision in the cities of Patna, Gaya and Muzaffarpur, the shared IPT services in these cities can be reorganized using the opportunity to transition to lower emission vehicles or e-rickshaws<sup>4</sup>. The vehicles can be selected based on their age. Case studies in India have used the opportunity of a technological transition to cleaner fuels and vehicles to organize drivers, services, reduce competition amongst drivers, provide training and health benefits.

### 9.1 Alwar Vahini Project

The transportation needs of Alwar city, with 3.6 lakh residents is catered to by informal public transport, which includes 750 auto-rickshaws, Vikrams and tempos. The services were operated on the discretion of operators, leading to poor quality of service and connectivity. Due to the small scale of the city, and narrow roads, a metro-rail or a BRTS would be unviable.

The Alwar Vahini project was launched in 2011 with the goal to provide opportunity to the people already engaged in public transport service to upgrade to a newer and better means of transport. It included a technology transition to Euro IV compliant Tata Magic and Mahindra Maximo vehicles with a seating capacity of 8 passengers and a driver. In 2015, 1,310 Vahinis provided different types of services i.e. Sheher Alwar Vahini, Gramin Alwar Vahini and Mahila Alwar Vahini (for and by women service) and catered to 0.1 million passenger trips per day (NIUA 2015).

Figure 2: Tempos in Alwar



Figure 3: Alwar Vahini



Source: (Pandekar n.d.)

The following are the measures taken to restructure the IPT services in Alwar.

#### *Coalition between different organizations*

The project is a joint effort between private and government organizations, including Regional Transport Office, a lead bank (PNB), Urban Improvement Trust (UIT) of Alwar and Bhiwadi District Administration (coordinator). The role played by the organizations are:

- Banks provided loans on 75% of the vehicle cost at an interest rate of 14.25% without any collateral with an extended payback period of 5 years. The buyer made a 25% down payment. The government acted as a guarantor under Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE). Anyone who had a driving license was eligible to apply for the loan.
- Bhiwadi district administration introduced an exchange scheme for three-wheeler owners in the city with an incentive to get loans at a low interest rate and all the arrangements documentation including vehicle insurance, RTO formalities, route permit etc. were made available through a single window.

<sup>4</sup> In the case of electric vehicles, charging infrastructure can be developed by the private sector, whereas the government needs to ensure availability of stable electricity.

- UIT Alwar and Bhiwadi district administration have built the support infrastructure and borne the cost of uniforms, identity cards, group insurance and soft skills training of the drivers.
- Tata and Mahindra offered a discount-cum-exchange scheme for the owners of three wheelers to buy a Vahini. They offered a discount of Rs. 45,000 on exchange of old three-wheeler (D. Shah 2015).
- A co-operative society<sup>5</sup> is established to provide a platform to all Vahini owners and to get common benefits like insurance, annual free medical checkups such as physical fitness, eye check-ups etc. The motto of 'Samman aur sewa' (respect and service) is used as a guiding principle. The association sustains itself by charging Rs. 25 per day from the drivers to provide education and healthcare facilities to drivers and their families.

Table 12: Financial model

Cost of a Vahini <sup>6</sup> (Pandekar n.d.)	Rs. 3.5 lakhs
Interest Rate	14.25%
Payback period	5 years
Discount on exchange of old three-wheeler	Rs. 45,000

Source: (D. Shah 2015)

The service was branded as Alwar Vahini to create an image and to provide a sense of ownership. The vehicles were painted with different colors and each vehicle has a unique number prominently displayed on the exterior to spot traffic violations. The drivers were given soft skills training on etiquette and driving discipline. They were also directed to keep vehicles clean and address all passengers respectfully. The Mahila Alwar Vahini was introduced in 2012, as a by women and for women service.

## 9.2 Dial-a-rickshaw scheme, Fazilka, Punjab

The city of Fazilka- with the population of 76,492 (Census 2011)- does not have an organized public transport system and are serviced by autos and cycle rickshaws for their transportation needs. Due to short average trip lengths (>3km), cycle rickshaws played a major role by catering to 16% of trips (NIUA 2015). There were around 450 cycle rickshaws in the city over an area of 11 sqkm.

In 2008, dial-a-rickshaw scheme was launched in Fazilka by an NGO named Graduate Welfare Association Fazilka (GWAF) to provide an organized rickshaw service called Ecocabs. The project focused on improving the reach of Ecocabs through a dial-a-service, quality of service for users at the same cost and improve livelihoods of the drivers/ tractions.

### *Digital integration*

A real time infrastructure was developed to upgrade the current cycle-rickshaws services with modern technology that will allow users to avail a rickshaw through a phone call within 10 minutes. A website and android application are also developed to provide detailed updated information to passengers.

### *Vehicle design*

The design of e-rickshaws was modified to make it more spacious and include space for advertisement, which can be used to earn additional revenues.

<sup>5</sup> A co-operative society is a voluntary association of at least 10 individuals of above 18 years age, who collaborate for common economic objectives. Co-operative societies are state subject. Cooperative societies are state subject, thus society fir Alwar Vahini is registered under Rajasthan Co-operative Societies Act, 2001.

<sup>6</sup> For a new customer. The amount is 3.15 Lakh for a person with old three-wheeler.





### *Financial support*

Tractions were provided financial support to buy a rickshaw through nationalized banks under Reserve Bank of India's Differential Rate of Interest Scheme at a 4% annual interest rate. Fast moving consumer goods companies and corporates were contacted for advertisement on the Ecocabs.

Table 13: Financial model for Ecocabs

Cost of an Ecocab	Rs. 10,000
Annual Interest Rate	4%
Payback period	36 months (3years)
Monthly instalment	Rs 300

Source: (GIZ 2015)

### *Infrastructure*

The municipal council-built rickshaw stands in 5 zones for parking with toilet facilities. These services were made available from 09.00 to 18.00.

### *Collaboration with other organizations*

BSNL collaborated with GWAF to provide free pre-paid connections to Ecocab operators.

### *Rules and regulations*

Fazilka Ecocabs management formed stringent rules for safety of both Ecocabs drivers and passengers. A membership is given to a driver only after 30 days of temporary membership and approval of 7 committee members. All the drivers are required to follow a code of conduct. Fines are also imposed for drinking and driving.

### *Training*

Tractions were given training on road safety and traffic calming, along with basic first aid awareness.

### *Additional benefits*

Tractions were also provided with other welfares schemes, which include the following:

- Free or subsidized health and accidental insurance of up to Rs. 50,000
- Free medical consultation by 10 private hospitals and doctors, subsidized medicines by authorized medical stores and free laboratory tests
- Free legal and medical advice to provide more dignity and respect to tractions
- Mobile phones at subsidized rates
- Annual Ecocab family trips
- Computer education to few educated traction men
- Free uniforms and woolen wears in winters



Figure 4: Cycle-rickshaws



Figure 5: Ecocab



Figure 6: Old cycle-rickshaw stand



Figure 7: New cycle-rickshaw stand



Source: (Asija 2012)

### 9.3 Implementation framework

The implementation of the recommendations is to be undertaken by various stakeholders. Their roles and responsibilities are given below.

Table 14: Stakeholder responsibilities

Recommendation	Stakeholder
Creation of an integrated public transportation plan	BUTSL
Identification and provision of IPT stand locations and provide space on streets	IPT unions, associations, Traffic Police and MC, PWD, SHA
Development of IPT stands	BUIDCO, MC, PWD, SHA/ private sector
Organizing IPT drivers into co-cooperative societies/ federations	IPT unions/ associations/ CSOs
Identification of beneficiaries	DA, RTO
Provision of subsidy	MC/ DA
Provision of loans at low interest rates	Banks
Procedures for issuing driving licenses and registering vehicles	RTO
Curriculum and manual for gender sensitization training programs for drivers	WDC in collaboration with BUTSL, cooperative societies/unions, NGOs

## 10. Safer travel in the night programs

Safetipin conducted safety audits across the cities of Patna, Gaya and Muzaffarpur during the day. These revealed that private guards and/or formal Police were observed only along 27%, 19% and 34% of Patna, Gaya and Muzaffarpur's streets. Similarly, streets have a low gender diversity with 83%, 91% and 88% of streets in Patna, Gaya and Muzaffarpur having no or very few women and children.

35% of women perceived the streets to be Very Poor in the night compared to 26% of the men. There was a strong correlation between the perception of the streets in the night with them being deserted, unlit and fear of theft and anti-social elements. A dedicated *Safer travel in the night program* is recommended to improve women's access to education and economic opportunities will need to ensure safer travel in the late evenings and night.

### Light up our streets

Streetlighting can be implemented on priority on public and intermediate public transport corridors and 5-minute walking distance from these. Schemes such as Atal Jyothi Yojana (Energy Efficiency Services Limited n.d.), a national scheme to ensure solar streetlighting across five states including Bihar in collaboration with EESL can be leveraged. In Patna, the Batti Jalo Ahhiyan (Patna Municipal Corporation 2020) is being implemented by the PMC and EESL. It aims to install solar streetlights to lower operating costs.



### Women led police patrols

Woman-led frequent Police patrols along public and intermediate public transport corridors, unsafe spaces identified through participatory safety audits will enable a sense a safety in the night.



“Pink Police patrols” are being implemented in Kerala, whereby the patrol cars are equipped with GPS, CCTV cameras in the front and rear of the car. These patrols will be trained to provide assistance to women and prevent harassment on streets (Kerala Police 2020). An all-woman night patrol team “Shaurya Vahini” comprising of 13 Hoysalas and 26 motorcycles driven by women was launched in Bangalore. Along with directives from the control room, which alerts them for cases related to women and children, an app ‘Suraksha’ will allow women to hit a panic button to alert the patrol team. To ensure the safety of the female officers, the women patrol team will be in constant touch with their male counterparts (The New Indian Express 2020).

Women led police patrols may be initiated in Bihar. Keeping in mind the safety of the female officers, each patrol team may consist of 2 female officers and a male officer. Help desks manned by the Police may also be set up at interstate and intercity bus terminals to further allay apprehension related to travel in the night.

### **Night accommodation for women**

Subsidized night accommodation for women at inter-state bus terminals can be provided, akin to the ‘Ente Koode’ and ‘One day home’ initiative in Kerala. ‘Ente Koode’ was initiated by the Department of Social Justice in Kozhikode and Trivandrum. It is located within the KSRTC complex and allows women travelers and their children – boys up to the age of 12 years to stay with their mothers - to stay rent free up to two days beyond which a nominal fee of Rs 100 is charged. The dinner is also provided free of charge (Times of India 2018). The ‘One-day home’ initiative, also housed in the KSRTC complex, was launched by WCD in collaboration with the Municipal Corporation for women who arrive in the city for urgent matters. No advance booking is permitted, with women and their children - boys up to 12 years of age - allowed to stay for a maximum of 3 days at subsidized rates of Rs 150 per day for the dormitory and Rs 250 for a cubicle. While the project is at present established only in Trivandrum, plans are underway to extend it to all districts in Kerala (Directorate of Women and Child Development 2020).

Subsidized night accommodation for women may be provided at intercity and interstate terminals in Bihar. Rent must be waived, or a nominal amount may be charged and male children up to an age of 12 years may be permitted to stay with their mothers. Security personnel must be provided and only women care takers may be present at the facility.

### **Request a stop**

Bus travel often necessitates the need for last mile connectivity. Last mile connectivity is often not assured at night, which leads to women having to traverse streets on foot. This often deters women from travelling at night. Programs such as the Request a Stop program which has been initiated in many countries across the globe can be initiated in Bihar, where women can request the bus driver to stop along the route, in between bus stops after 8/9pm.

### **Street vendors as Street Marshals**

Street vendors are often seen as allies by women travelling at night. Promoting street vendors as street marshals can ensure safer streets and travel at night. Street vendors can be given training to better respond to harassment they may witness on the street such as alerting relevant authorities. This will also improve the perception of street vendors as safety enablers for women, instead of being perceived as obstacles on the footpath, and may reduce their harassment.

### **Mahila Police Volunteers and Community Policing**

Mahila Police is a national initiative where the volunteers act as links between the Police and the public. The volunteer reports incidents concerning women and children to the police, while also raising awareness of the existing schemes available for women and children. Further, recommendations when recruiting MPVs include having NGOs comprise 30 percent of the screening



committee that aids the SP in the selection process and MPV must be provided relevant gender training. Community-based Police programs along the lines of the Janamaithri policing initiative in Kerala can be adopted at the community level. This involves close cooperation between the public and the Janamithri police, where the trained male and female beat officers build close personal relationships with the families on their beat. In Bihar, initiatives such as Ladli cops have been implemented that trains female student volunteers from 5 colleges in Patna to coordinate with the Police and file complaints in the case of harassment in public spaces and public transportation (Deccan Herald 2016).

## 10.1 Implementation framework

The implementation of the safer travel at night program can be spearheaded by the Home Department in collaboration with the Women's Development Corporation. The roles and responsibilities of stakeholders are given below.

Table 15: Stakeholder responsibilities

Recommendation	Stakeholder
Installation of streetlights	EESL, PWD, SHA, MC
Women led patrol	Home Department
Help desk at terminals	Home Department, BSRTC, MC
Subsidized night accommodation for women at terminals	WDC, BSRTC, MC
Request a stop program	BUTSL, PUBC
Training of street vendors	WDC, Home Department, NGOs
Community based police programs	Home Department
Mahila Police Volunteer program	WDC, Home Department, NGOs



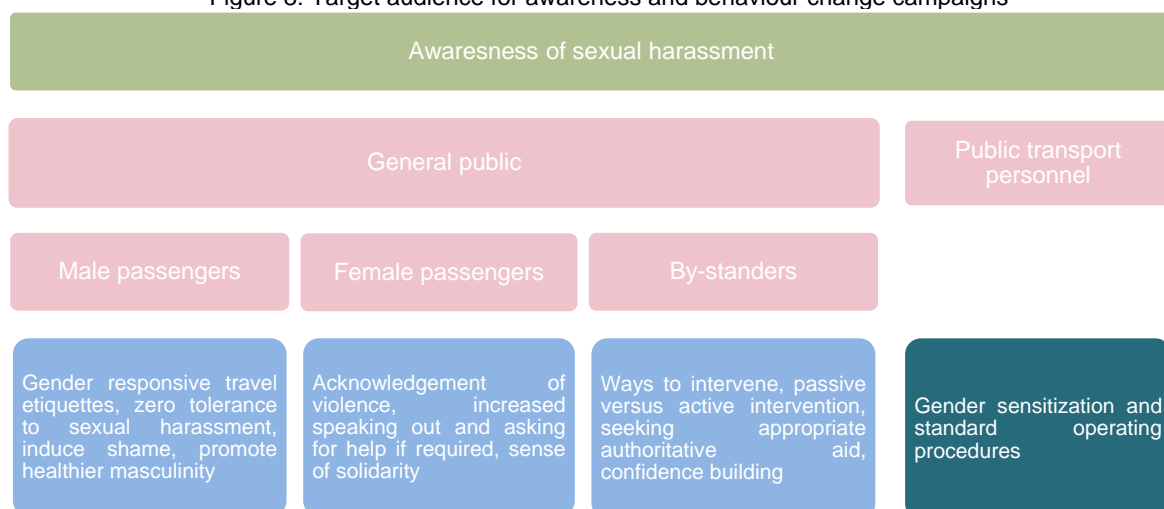
## 11. Conduct awareness and behaviour change campaigns

The survey findings revealed that women have internalized the existing condition of the urban mobility services, lack of infrastructure and normalized the sexual harassment faced in public spaces.

According to the social norms approach, certain negative behaviour is normalized and continually perpetuated due to the misconceived social norms around them. Such normalization affects individual behavior in two ways: by justifying the prevalence of dangerous behavior, and by increasing the likelihood of an individual remaining silent about any discomfort caused by such behavior (thereby reinforcing social tolerance of it) (World health organisation 2009). The social norms approach aims to correct these misperceptions thereby reducing harmful behaviour. Therefore, in addition to the infrastructure improvements, there is a need to communicate a zero-tolerance approach to sexual harassment on streets, dos and don'ts on how to behave in shared IPT and buses, encourage women to speak up and encourage by-stander intervention, including positive masculinities.

The target audiences for the awareness and behaviour change campaigns are identified. These include male and female passengers, bystanders and public transport personnel (Figure 8).

Figure 8: Target audience for awareness and behaviour change campaigns



### 11.1 Female passengers

Three key aspects in the behavior of female passengers that need a nudge are: acknowledgement of violence, reporting of instances of violence, and expressions of solidarity with co-passengers.

#### Acknowledgement of violence

This is the most basic, yet complex, step to preventing (increase in) sexual harassment wherein identifying violence and not allowing it to be a social norm is the key. With continued upholding of beliefs that fail to question men for their violent behavior and shame women as victims like "*Ladke toh aise hi karenge*", ("boys will be boys"), "*Usi ne kuch kiya hoga*" or "*aise kapde pehnegi toh...*" ("She asked for it") or (if she wear such clothes) and "*Par utni badi baat thodi hai!*" ("It's not such a big deal!"), women have been conditioned to accept violence as common manifestation of male desires. In a society of this structure where identifying violence becomes increasingly difficult for women, there is a need of community mobilization to raise collective awareness on the multiple forms, languages and intensities of sexual violence. Some interesting and highly effective activities under this mobilization could be participatory street art and community art campaigns that emphasize on empathy.



### *Street art and community art campaigns*

An innovative participatory approach was undertaken in Dharavi (Mumbai) to develop a visual map of gender-based violence experienced by girls and women. A tactile map of hurt was developed using denim pieces and other found objects with the support of the community members (150 participants), who marked the localities and streets where gender-based violence was observed. The mapping exercise was accompanied with reflective questions like Why do certain streets have more incidences of eve-teasing? What are the gendered spaces in Dharavi? How can Sanginis<sup>7</sup> prevent domestic violence in a particular chawl, that helped in understanding of the social and geographical factors that might lead to gender-based violence (Dharavi Biennale 2014-2015). This activity initiated the conversations around sexual harassment and provided a sense of belonging to women, which empowered them to speak up.

The Fearless Collective (Delhi) and The Aravani Project are also similar art projects in India, with a focus on community participation and social messaging. They have worked on a range of women-related themes, from visibilizing sex workers to initiating conversations on challenges to safety of women during the peak Delhi fog. While the former is working to empower women (cis) of religious, ethnic and socio-economic minorities (The Fearless Collective 2012), latter is very specifically working for the rights of trans women (Aravani Art Project 2016).

Figure 9: A mural in Dharavi by The Fearless Collective



Source: (The Fearless Collective 2012)

Figure 10: A mural in National Law School, Chennai



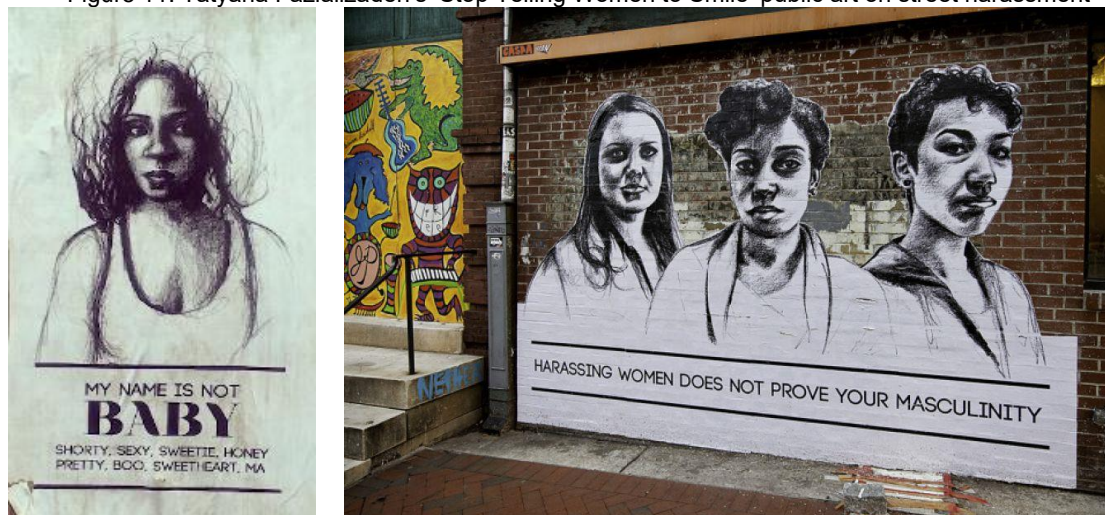
Source: (Aravani Art Project 2016)

Another similar global street art project that draws attention to sexual harassment and violence in the public is the 'Stop Telling Women to Smile' campaign that originated in Brooklyn, New York, in response to the artist's personal experiences of street harassment. Though the title of the campaign is specific, it features murals and posters on a range of messages from women towards their harassers and also features portraits of the said women (Stop Telling Women to Smile 2014). Madhubani paintings could be used as an art form to communicate these messages, build solidarity and encourage speaking up.

<sup>7</sup> Sanginis are the women volunteers under Little Sister Project of SHEHA to identify and report gender-based violence using an Android application. Sanginis are provided with mobile phones with a survey app and an alert app called Eyewatch. The application helped Sanginis to record details of the incidents that are required to respond and prevent violence against women and children.



Figure 11: Tatyana Fazlalizadeh's 'Stop Telling Women to Smile' public art on street harassment



Source: (Stop Telling Women to Smile 2014)

Art practices can be further sustained through workshops with girls and women (with no age bracket) that help them recognize such violence/s in all spaces of their life (domestic, social, private, and public). Considering most people accept the authority of the law - legal awareness workshops could be a great start to counter the law of the land with law of the nation and provide women with the confidence to respond during experiences of harassment in public spaces.

### Reporting of violence

The normalization of sexual harassment not only leads to under-reporting of it by women but also makes the violence invisible. Women may often blame themselves for being the victims while other women around them seem to have safer experiences. Hence, interventions that affirm a woman's belief in her experiences of violence and give her confidence to voice it could be a great step to tackle sexual harassment.

#### *Campaigns that empower women to report sexual harassment*

One of the best practices in this kind of intervention is the 'You have the right to speak up' campaign by Washington Metropolitan Area Transit Authority (WMATA), an extension of which can be 'You have the right to "make a scene"' in India. The emphasis on 'make a scene' in the earlier statement is to also pierce through Indian (read: Asian too) woman's common concern that she wouldn't want to draw attention to herself for fear of worse or sustained harassment (Almuna, et al. 2019).

Figure 12: WMATA's anti-harassment campaign



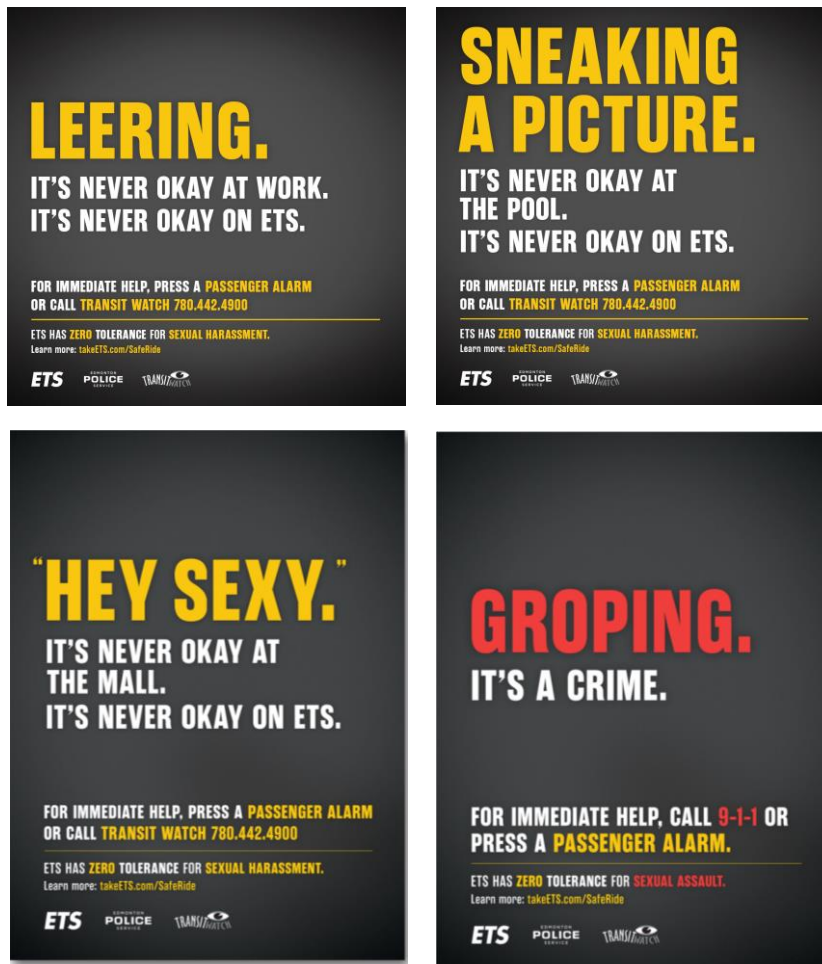
Source: (Samra 2018)

Lack of clarity on authorities to report to and consequent lack of action from their end (Almuna, et al. 2019) is the other reason of underreporting. It underscores the need of action-oriented communication from the transport authorities. If female passengers are presented with campaigns that state clearly what the abuser will face, beyond monetary and legal consequences, it might lead to increased



confidence in female passengers. Such proactive communication also presents the transport authorities as a responsible figure, which will build trust and only make the women want to report more often. Presently, there are no such campaigns, but a rather important zero tolerance communication by transit authorities. One such campaign is Edmonton Transit's 'Safe Ride' campaign that is sharp and neat in its policies on sexual harassment. It empowers people to feel comfortable for asking for help (Mertz 2018).

Figure 13: Posters used in Edmonton Transit's Safe Ride campaign



Source: (Mertz 2018)

### Solidarity building (authority-to-passenger and peer-to-peer support)

Another principal element to increased number of women seeking help or reporting their experiences of sexual harassment in public, is their anxieties with being believed or "taken seriously". To address these concerns, there could be two different sets of constructing relationships, one between the transport authorities and the female passengers, and the other between the female passengers themselves. For transport authority-to-female passenger, it is imperative that simple, clear and positive messaging is delivered, publicly, showing support to women who experience sexual harassment. The Transport Authority of River City (TARC), USA, had initiated campaign #WeBelieveYou for similar reasons (Louisville 2018). The project, sublimely, undertakes inclusive representation of women of most races, sexualities, ethnicities and classes which is a great tactic to push citizens to unlearn and relearn multiple prejudices and microaggressions through a single (and simple) communication campaign.



Figure 14: TARC's #WeBelieveYou campaign in Louisville, USA



Source: (Louisville 2018)

For peer-to-peer support, no particular communication campaigns exist presently, but an interesting and different methodology can be to develop a companion system for new and older passengers to find, interact and create their own group travelling patterns, through an application, as has been demonstrated in Jakarta by Pulse Lab and United Nations Entity for Gender Equality (Almuna, et al. 2019). The application connects passengers living in the same locality with each other. It provides a sense of belonging to new migrants in the city as well as allow citizens the agency to sustain their safety patterns as per their respective needs.

Though it is a highly tech-oriented method, it is not tech-intensive, so female passengers with the most basic smart phones and GPS and texting skills can be included in this intervention. On the other hand, one of the most pressing concern with the development of such an application, is its misuse via fake profiles and identities – which is an increased threat to the female passengers, especially because it also demonstrates the physical proximity of the co-passenger's residence/workplace. If the privacy clauses can be molded, along with verification of identities (perhaps while issuing smart cards for Metro travelers or uploading identity cards onto the application), this is a method with immense potential.

## 11.2 Male passengers

According to multiple reports, most of the aggressors and abusers in the public space are men, of varying economic strata. Hence, to initiate dialogues with them is as important as initiating any communication towards the female public. In the last decade, there have been increasing communication and awareness campaigns (not restricted to public transit) that call for equal participation of men in conversations against sexual harassment, some of which are #AskMoreofHim, 'It starts with You', 'Where do you stand?', and Men Can Stop Rape campaign.

According to an article (Svoboda 2018) by Greater Good Magazine<sup>8</sup>, the occupation of powerful roles affects the willingness of men to speak up. The article cited a study conducted in Northwestern University, where subjects from "high power" mindset were found to be "less adept at reading

<sup>8</sup> A product of the Greater Good Science Center at UC Berkley.



people's facial expressions, indicating an empathy deficit, and also less likely to take other people's perspectives into account as they assessed a situation". Taking note of such existing Science on male behavior, and likelihood to unlearn or intervene, some campaigns have been working in gentle but evocative methods on shifting male psyche and behavior towards women, violence and desires.

### **Healthier Masculinity**

'It Starts with You' is a sustained series of events, advertisements, and community mobilization activities that seeks to initiate the conversation of healthier masculinity among men. It encourages men to talk to their younger male counterparts about gender equality and the male privilege to intervene in the structures of sexual harassment (It starts with you. It stays with him 2015). The campaign uses digital platform and social events like 'Walk a Man' event that requires men to walk in heels for a mile to engage the enrolled coaches.

In the Indian context, a coaching program can be developed to identify, train and build healthy masculinity coaches in public transit personnel like bus drivers, conductors, and depot managers, and private operators. Rather than a mentor-mentee relationship, these healthy masculinity coaches should be trained on the nuances of sexual harassment faced by women in public, everyday sexism, trauma sensitive verbal and non-verbal language, and definitions and consequences of toxic masculinity in India; only then, the coaches should be allowed to continue with the program which should primarily include checking in with co-coaches on 'topic of the month' (any relevant news on patriarchy), their experiences with masculinity in that month, detailing two to four instances of acknowledging their changed or unlearned behavior, and other kinds of engagements with the "boys locker room" in their social circle. As this demands high labour and commitment to the cause, socio-financial or cultural incentives can be awarded to keen participants via certification, felicitation by leaders and recognition in the media.

Another rather catchy campaign with regard to healthier masculinity is ~~'Where do you stand?'~~ by Men can Stop Rape project, which creates positive imagery and a sense of heroism for men who are sensitive to realities of sexual harassment and violence faced by women (Marbach 2012). The campaign uses "regular looking" men to convey "regular" messages on sexual violence, more than harassment (Figure 15).

This concept can be applied to cities in India and Bihar by developing creatives that involve regular men (such as the auto-rickshaw driver, the male passenger) taking a stand against "regular" sexual harassment like passing lewd comments, staring, singing inappropriate songs and stalking. Such campaigning will draw attention to the intensity of these acts and present them as important and relevant conversations to happen in the public. Taglines, accommodating sentiments, can be used, such as *'When Rahul was singing at women on the street, I told him to shut up! I am the kind of guy who takes a stand. What about you?'*, *'When Ankit kept stalking and following the woman who he only saw once at the bus stop, I told him to stop being a creep. I am the kind of guy who takes a stand. What about you?'* or *'We are the kind of guys who stop our brothers from being perverts. We take a stand against sexual harassment. What about you?'*. These sentences should be translated into vernacular and colloquial languages where required.

Such a campaign may also add to the existing 'I Respect Women' / 'Mera Imaan, Mahilaon Ka Sammaan' sticker-campaign visible on autos and taxis of Delhi (Vaishnavi 2017). Providing transit personnel and male passengers with visual and nomenclature references, beyond simply according them the responsibility via text, could be more affective.



Figure 15: Posters used in 'Where do you stand?' by Men can Stop Rape project



Source: (Where Do you Stand? 2020)

### Gender responsive travel etiquettes

The surveys and focus group discussions with women revealed the men often sit on seats reserved for women, provide uncalled for assistance while boarding the bus, put their arms around women's shoulders in shared IPT, find excuses to lean on them when a bus halts abruptly, manspreading out of perverseness, and gazing inappropriately. To tackle such behavior, communication messages can induce feelings of shame and guilt in the perpetrators through multiple media: stickers and pamphlets in vehicles that demand attention to the content (Wang 2017), multi-media audio-visual communication published at bus stops, train stations, traffic signals, and other spaces that have appropriate equipment for broadcast.

Figure 16: Sticker used by Madrid Transportation Authority to stop manspreading



Source: (Wang 2017)

Audio- visual content is compelling and affective as it can engage multiple senses. Some convincing campaigns/ content that spotlight physical harassment and demand better etiquettes on public transport carriages are: Stand Together Against Sexual Harassment in Myanmar (International Development Law Organization 2019), Hands Offs in Victoria, Australia (Fileborn 2017), Dekh Le in India (Raj 2013), and Report It to Stop It in London, United Kingdom (Bramley 2016). UN Women (Mexico) reversed the gaze with video graphing and playing live close ups of buttocks and other intimate body parts of male passengers in Mexican public transport carriages to shed light on the



violence and extreme discomfort female passengers feel when they are stared, looked or gazed at inappropriately (Kiido 2017).

Figure 17: Screen grab from the video 'Report It to Stop It' on harassment in London tubes



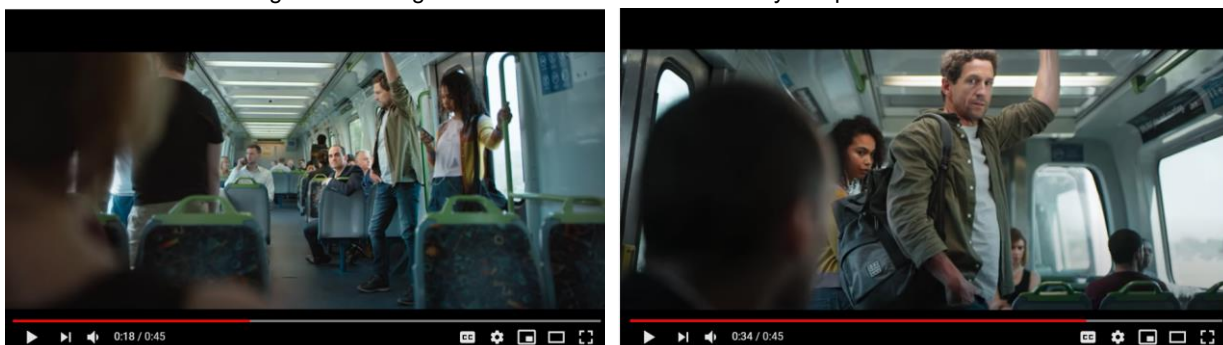
Source: (TfL 2015)

### 11.3 Bystander Intervention

Bystander intervention has potential to decrease incidents of sexual and other forms of harassment, but also is one of the trickiest behavioral chance communications (The Visual House, 2020) that targets audience for its reluctance to act. There are multiple reasons for bystanders not getting influenced or affected “enough”, ranging from feeling apprehensive of worsening situation for the victim (Almuna, et al. 2019), misinterpreting gestures thus inviting embarrassment to self, worrying about retaliation, to more dangerous ones like diffusion of responsibility and attribution of worthiness to the victims (Lea, D'Silva and Asok n.d.). Despite and considering these challenges, targeted and clear communication with bystanders can yield positive outcomes.

A well designed campaign for bystander intervention is 'Call it Out' in Victoria, which nudges passive (male) bystanders into active ones by emphasizing the importance of “small acts” such as standing between the perpetrator and the subject, making eye contact with the perpetrator, distancing the perpetrator away using body in crowded spaces (Victoria 2019). The campaign does not call out sexual harassment as much as calling it in while also ensuring that bystanders experience as little discomfort and anxiety as possible while being involved in such circumstances.

Fig.18. Screen grabs from the video 'Call it Out' by Respect Victoria



Source: (Victoria 2019)

## 11.4 Implementation framework

Awareness campaigns aimed at encouraging women to acknowledge and report harassment as well as the sensitization of male passengers can be led by the WDC in collaboration with UDHD, the transport department and NGOs.

## 12. Encourage women's participation in the transport sector

Women's role in the transportation sector can be increased by targeted efforts. These include maintenance of transport facilities such as terminals and specifically public toilets, targeted schemes to encourage women e-rickshaw drivers and female bus conductors over a longer term.

### 12.1 Maintenance of transport facilities

Kudumbashree Facility Management Centre (KFMC) started its journey when it was recruited by Kochi Metro-rail Limited (KMRL) to maintain the metro-rail stations. It manages ticketing, customer care, housekeeping and gardening. Kudumbashree selected and trained 780 staff after conducting written exams and interviews with 40,000 applicants. Currently, KFMC is also responsible for housekeeping and security contracts to maintain the Vyttila Mobility Hub, which is a multi-modal transportation hub in Kochi. It has also created indirect employment for women through Kudumbashree led micro-enterprises such as apparel for employees, waste management at the metro-rail stations, transport for employees in the night shift. This can be initiated in Bihar in the maintenance of terminals and public toilets as a first step.

### 12.2 Women e-rickshaw drivers

The Chief Ministers Rural Transport Programme launched in 2018 provides a subsidy to five individuals in each panchayat to own and operate an intermediate public transport vehicle (with a capacity of 4-10 persons) and improve connectivity to rural areas. This is being implemented by the district transport office (DTO). The subsidy is a maximum of Rs 1 lakh or 50% of the cost of the vehicle, whichever is lesser. Three of the five beneficiaries will be from Scheduled Caste/ Scheduled Tribes and two from economically backward castes. In October 2018, 1,300 applications were received, and the target is 42,315.

This scheme can be extended to target resource poor women in urban areas to encourage women e-rickshaw drivers. However, the experience in Allahabad in Uttar Pradesh reveals that this process involves extensive mobilization of women, providing training on driving and maintaining an e-rickshaw and gender rights, understanding traffic rules, instilling confidence in navigating traffic, providing equipment such as mobile phones, CCTV cameras within the vehicle and connecting them to the Police stations and financial support in procuring loans.

Driving skills are often imparted informally and the focus group discussions with male rickshaw drivers in the 3 cities indicated a strong resistance to women drivers. Therefore, the scheme should provide additional financial and other support to guide women in the entire process – from mobilization, driving, obtaining licenses, down payment, financial assistance and registration of vehicles.

JEEViKA, the flagship programme of the Government of Bihar, operates in all 534 blocks of the 38 districts of the state, with the goal to empower women economically and socially. JEEViKA functions under the Bihar Rural Livelihoods promotion society and mobilizes women from marginalized households (especially from Scheduled Caste and Tribe households) into women's self-help groups (SHGs), which are federated into Village Organizations (VOs) and Cluster Level Federations (CLFs). Once this pyramid of institutions is established in a village, the project delivers targeted funds for micro-credit, food security, insurance against health emergencies, and promotes livelihood opportunities in the community (Centre for Catalyzing Change 2019). The JEEViKA program can be



explored to encourage women e-rickshaw drivers in rural and peri-urban areas, expand to urban areas and partner with government agencies to take up contracts to maintain transport facilities. Cues can be drawn from the Kudumbashree program in Kerala, which is a women empowerment and poverty eradication program initiated by the State Poverty eradication mission. Kudumbashree has a three-tiered structure with neighborhood groups at the lowest level, Area development societies at the ward level and at the highest level, which is the local government, the community-based societies. The formation and organization of Kudumbashree was influenced by the devolution of powers to the Panchayati raj and thus facilitates the organization of women for self-help to identify demand-based activities and available resources, while improving their agency to address their economic and social upliftment. Kudumbashree provides the necessary financial and technical support through trained resource person's, Micro enterprise consultants, Café management team, training teams for various programs and an accounts and audits service society. The governance of Kudumbashree is overseen by the ministry of local self-governance, State planning board, State Women's commission, and various other government departments

### 12.3 Implementation framework

The state transportation department and the women development corporation can initiate programs to encourage women's participation in the transport sector.

Table 16: Stakeholder responsibilities

Recommendation	Stakeholders
Train and employ women in the maintenance of transport facilities	WDC, SULM, NGOs
Encourage women's participation in the Mukyamantri Gram Parivahan Yojana	TD, WDC, JEEViKA, NGOs
Mobilize and train women e-rickshaw drivers	WDC, TD, RTO, NGOs





### 13. Phasing of recommendations and coordination

The responsibility of urban transport is fragmented across different levels of national, state and urban local bodies as well as across departments. A Women's Mobility and Accessibility Cell is proposed at the state level within UDHD to co-ordinate with Transport Departments and para-statal agencies in implementing the recommendations at the state, district and city levels, monitor the progress of implementation, evaluate impacts and build capacity within urban local bodies. In the medium to long term, a Women's Mobility and Access Cell should be created within the Unified Metropolitan Transport Authority to ensure gender mainstreaming within all mobility policies adopted within metropolitan areas in the state.

The phasing of the recommendations is shown below.

Table 17: Recommendations phasing and nodal agencies (years)

Activity	0-1	1-3	3-5
Adopt gendered mobility indicators, street design guidelines, and create a Women's Access and Mobility Cell			
Create a street design cell			
Redesign of major and intermediate roads in 3 cities, area-based development of the SCM			
Traffic-calming, installation of streetlights and resurfacing of local streets			
Prepare and implement the public transportation plan			
Reorganize IPT services			
Woman-led Police patrol			
Help desk at terminals			
Subsidized night accommodation at terminals			
Request a stop program			
Street vendors as street marshals			
Community based police programs			
Mahila Police Volunteer program			
Initiate awareness and behaviour change programs			
Maintenance of transport facilities			
Mobilize and train women e-rickshaw drivers			
Encourage women's participation in the Mukyamantri Gram Parivahan Yojana			



## Annexures

### Annexure 1: Net cost contracts: Hong Kong Special Administrative Region

Hong Kong, a Special Administrative Region (HKSAR) of the People's Republic of China (PRC), has a population of 7.3 million (HKSAR 2017). The public transportation system in Hong Kong is operated by private players but oversee by the Hong Kong Transport Department. The public transportation system in Hong Kong includes heavy rail, light rail, franchised buses, public light buses, non-franchised buses, taxis, ferries and trams, which cater to 90% of trips (12.3 million passenger trips per day) (Chisholm-Smith 2010). Buses are the predominant mode of transport in Hong Kong. Currently, there are 17,150 buses operational in Hong Kong under three types of bus services- (i) Franchised bus services, (ii) Non-franchised bus services, and (iii) public light buses- which cater to around 50% of public transport patronage (Transport and Housing Bureau, HKSARG 2017).

The Transport Department operates its buses on a net cost contract model and grants licenses to private operators to operate public transportation, including bus and train services. Under this bus contracting model, bus operators are allowed to keep 100% of their revenue up to a 9.7% of a profit return, after which they have to share 50% of excessive profit for customer benefits in terms of a low fare and better service quality (Chisholm-Smith 2010). The Transport department of Hong Kong has established performance standards for bus services under six categories: (i) Reliability, (ii) Efficiency, (iii) Safety, (iv) Cleanliness, (v) User friendliness, and (vi) Environmental friendliness.

Table 18: Service performance indicators for bus services in Hong Kong

Service performance indicator	Measurement item
<b>1. Reliability</b>	
Bus availability	Ratio of actual bus allocation to scheduled allocation
Lost trips	Maximum allowable percentage of total trips scheduled
<b>2. Efficiency</b>	
Bus utilization	<ul style="list-style-type: none"> <li>Percentage of the licensed fleet that is on the road</li> <li>Bus fleet at different times of day</li> </ul>
<b>3. Safety</b>	
Training program for new bus captains (drivers)	Percentage of newly recruited bus captains who receive training before providing service to passengers
Training for in-service bus captains	Percentage of bus captains who participate in at least one training session every 3 years
<b>4. Cleanliness</b>	
Bus body	Washed once daily
Bus floors	Swept at least twice per day
<b>5. Environmental friendliness</b>	
Bus model	Percentage of fleet meeting Euro 2 (or higher) emission standards, with an obligation that all new fleet should maintain this standard
<b>6. User friendliness</b>	
Complaints	The maximum response time for a complaint should be 10 days. (For complex cases, the response period can be extendable to 1 month, provided an interim)
Passenger liaison meeting	6 times a year
Passenger information at bus terminals	Current route and fare information should be readily available at all bus terminals
Passenger information at stops	Current route information should be readily available at all bus stops

Source: (Chisholm-Smith 2010)



#### *Role of private operators*

The operators are liable to design or change bus routes, bus design, frequency of buses and operating hours on each route, with the approval from the transport department (Savelli n.d.). They can apply for a fare increase based on 'Basket of Factors' listed by the transport department. All the private bus operators must submit an annual performance report to the transport department, which is used to review the progress of each operator. If an operator continually fails to meet the minimum standards, the contract can be taken away or not renewed.

#### *Role of the government*

The government does not provide any direct financial subsidy to operators, but support the bus services through waivers of license fees, depot rental fees, and facilitate service through enabling infrastructure like terminal, bus lanes, new roads etc. The transport department administers customer satisfaction surveys to measure performance of operators on user friendliness, and compliance with the above measures (Table 18). The Transport Department also holds meeting with private operators to review the performance and identify the gaps that restrict operators to achieve their performance targets.





## Annexure 2: Quality incentive contracts: Transport for London

London covers an area of 1,572 sqkm with 8.6 million people. The public transportation system of London is a combination of buses, underground rail network, Docklands light railway, London Trams and London trains. Buses are the predominant mode of public transport in London, which cates to 21% of total trips (TfL 2018). Public bus transport in London is operated by the London Bus Services Limited (LBSL). It is responsible for planning routes, specifying service levels, ensuring service quality and maintenance of infrastructure. The city has 675 bus routes, with around 9,000 buses in operation and over 19,000 bus stops (London Assembly Transport Committee 2017).

Since 2001, London is using Quality Incentive Contracts for bus operations. **Quality Incentive Contracts** (QIC) are gross cost contracts, which include financial incentives for operators linked to the quality of service. The contracts are tendered for each route. There are minimum service standards for each route and operators may incur a deduction of 1% of the contract price for each point below the standard and 1.5% of the contract price as bonus for each point above the standard. The assessment of service standards is done on a yearly basis and bonus and deductions are capped at 15% and 10%. QICs are initially tendered for 5 years, which can be extended for 2 more years, subject to the performance.

Table 19: Service standards for bus services in London

Indicator	Unit	Description
Performance reliability for high frequency services <sup>9</sup>	Excess Wait Time (EWT)	Extra time passengers had to wait above the average scheduled wait time.  Change unit: 0.10 minute
Punctuality on low-frequency services <sup>10</sup>	On time departures	Percentage of departures that leave on time, which means that departures are within a window of 2½ - 5 minutes.  Change unit: 2% change from the minimum standard
Driver and vehicle quality monitoring	Through static audits <sup>11</sup> and Mystery Customer Surveys <sup>12</sup>	Static audits: 17,000 to assess aspects of service delivery  Mystery customer surveys: 33,000 to assess vehicle handling, and customer interaction
Customer Satisfaction	13,000 customer satisfaction surveys are conducted each year	The surveys aim to assess 11 specific aspects: personal safety & security; crowding; reliability; information; state of repair of bus; cleanliness; bus stations; bus stops & shelters; smoothness of ride; staff behavior and value for money
Engineering Quality Monitoring	25% of each operator's fleet is evaluated	To assess the mechanical condition and maintenance procedures of the fleet
Driver Quality Assessment	Periodical assessments of driver's technical ability	6,500 assessments each year across the London Bus network to assess driving skills
Safety	Accident reports. CCTV and on-road recording equipment	Failure to comply with the safety indicator standard implies the cancellation of the contract and/or disqualifying the operating company for future operation contracts.

Source: (The Global Green Growth Institute 2018) and (TfL 2015)

<sup>9</sup> 5 or more buses per hour

<sup>10</sup> 4 or less buses per hour

<sup>11</sup> Aspects evaluated include bus conditions, visibility of variable message signs, cleanliness, timetable or frequency information display at bus stops and lighting, among others.

<sup>12</sup> Bus service: crowding, reliability and overall performance of equipment on board, including smart card validation, doors and route information displays. The driver is evaluated on aspects such as his/her availability to answer questions, driving skills (e.g. smoothness of braking and acceleration) and his/her appearance.



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