WOMEN'S SAFETY AUDIT OF DHAKA

FINAL REPORT

by Safetipin

DHAKA

BANGLADESH

23.7578°N / 90.3929°E

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WOMEN'S SAFETY AUDIT OF DHAKA

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DHAKA NORTH AND SOUTH CITY CORPORATIONS'

WOMEN SAFETY AUDIT OF PUBLIC SPACES

Safety, accessibility and inclusion in public space

Public spaces play a significant role in enhancing the liveability of cities. They may range from informal street corners to prominent city plazas and landmarks. Public spaces can contribute to city's functionalities including social interactions and fostering health and economy. Streets as public spaces promote social inclusion and cohesion by providing a platform for people from different communities and neighbourhoods to interact on issues of common interest. They enhance access to public infrastructure and amenities (such as education, health, recreation, etc.) for all user groups including women, children, elderly and differently abled.[9] They enable residents to use and claim their right to the city. Due to their significant benefits in improving the liveability in cities, universal access to public spaces is now part of the Sustainable Development Goals.[10]

On the contrary, unhealthy urban environments and poorly managed public spaces can take a toll on the liveability, resilience and inclusivity in cities. Poorly designed and maintained public spaces impact the life of residents who rely on them to access jobs and earn a livelihood. Global experience has shown that public spaces are successful when they are focused on local communities, urban living and place making. Human-centred design, diverse activities, inclusion and safety contribute to a sense of place in the public domain. Public spaces are more meaningful and create value when they are co-created by people of the local communities who will be the prime users of the space.

Ease of access to a public space is one of its key elements that determines how it will be used. Different modes of commute including walking, cycling and public transport enables users to access various public spaces such as streets, markets, etc. in their everyday lives. Public transport, walking and other non-motorized modes of transport are of greater significance for women as they often have limited mobility choices as compared to men.

WOMEN IN PUBLIC SPACES OF DHAKA

With rapid urbanization, more women are migrating to urban areas from rural areas in search of better livelihood opportunities. Women's lives have changed tremendously in the past 30 years in Bangladesh and has improved in many ways. Bangladesh has made great strides in female labour force participation (FLFP) and now outperforms its neighbours; India and Pakistan. However, FLFP rates in Bangladesh have been declining in the recent years. As per the 2018 statistics of Bangladesh Bureau of Statistics, FLFP rates fell from 34.5 percent in 2010 to 33 percent in 2013 and most recently to 31 percent in 2016 and 2017. This is a troubling trend considering the recent urbanization trends.

As Bangladesh continues to urbanize, it is important to understand the factors that reduce women's social and economic participation in public spaces. Mobility, walkability and access for women is limited in public spaces due to poorly planned or inadequate infrastructure and services (such as lack of adequate footpaths, streetlights, public toilets, etc.) as well as prevailing socio-cultural norms. Perceptions of, and actual threats to, public safety limit women's use of public spaces. In one study, it was reported that 93% of women in Dhaka do not use public toilets while 42% perceive the city's parks to be unsafe.[11]

Walking is still a prevalent mode of commute in Dhaka. Of the 65% trips made by non-motorized transport (NMT), 39% trips are made on foot, while the balance are on bicycles and rickshaws.[12] More than half of the people in the poorest income quintile still walk to work. Among the poorest, access to jobs falls off drastically beyond a 5km commute radius. This is usually more common for women who have limited mobility choices as compared to men. As per The World Bank's Bangladesh Poverty Assessment: Facing old and new frontiers in poverty reduction report, 2019, women are 3 to 4 times less likely to work as compared to men. Those who work are more likely to walk and commute shorter distances as compared to men.

In low-income communities, women are discouraged to take up jobs outside of the neighbourhood. 30% of surveyed women said that they return home before dusk due to safety concerns and many of them avoid public transport due to fear of sexual harassment.[13] Embedded and persistent cultural and social norms also act as barriers to women's mobility in both high and low-income communities. Childcare emerges as an key constraint for women's mobility in urban areas.

As per another study by The World Bank titled "What Works for Working Women?" Understanding Female Labour Force Participation in Urban Bangladesh, lack of safety in public spaces affects the choice of employment of women in Bangladesh.[14] The study revealed that public spaces in Dhaka are often male dominated and that this is correlated to women's employment decisions. Women who do not feel safe and are 10% less likely to participate in the workforce. The research also highlights that for many women, working and moving out in public spaces is not deemed desirable. Men spend almost four times more time outside their communities than women do. A quarter of women only leave their neighbourhood once in a month and one in ten never leave their community at all.

Lack of safety has adverse implications on the life of girls and women. These include lack of self-confidence, low productivity levels and overall low self-esteem. To encourage girls and women to use public spaces freely, availability of safe, affordable and reliable modes of public transport is a necessity.

To address the safety concerns of women and girls in Dhaka and to improve access, mobility and inclusion in the city, this project collected data on the quality, usage and perceptions of public spaces, particularly from a safety perspective of women and girls.

9 UN-HABITAT Public Spaces – Drivers of Prosperity (2013)
10 Infographic: Why gender equality matters to achieving all 17 SDGs | Digital library: Multimedia | UN Women – Headquarters
11Action Aid (2015), "Women and the City III"
12 Transport Sector Briefs, World Bank Transport & ICT Global Practice (2017) based on "The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka" by JICA and Dhaka Transport Coordination Authority (2016)
13 World Bank (2019) Bangladesh Poverty Assessment: Facing old and new frontiers in poverty reduction Washington DC © World Bank
14 Aphichoke Kotikula, Ruth Hill and Wameq Azfar Raza, 2019, What works for working women? Understanding female labor force participation in urban Bangladesh. Washington, DC: World Bank

WOMEN SAFETY AUDIT BY SAFETIPIN

A Women's Safety Audit (WSA) was conducted in two city corporations in Dhaka – Dhaka North City Corporation (DSCC) and Dhaka South City Corporation (DNCC), using Safetipin digital tools to provide accurate data on aspects of the built environmental which are linked to safety, accessibility and inclusion for women in public spaces. This information can be integrated into existing government GIS platforms and can be used to guide policies and interventions in both the city corporations. WSAs have been used successfully globally, including in India, where data and evidence collected through such audits has led to number of city-wide public infrastructure up-gradation projects and hence has improved the usage of spaces in the city.

UNESCO's definition of public space refers to an area or place that is open and accessible to all people, regardless of gender, race, ethnicity, age or socio-economic level. These are public gathering spaces such as plazas, squares and parks. Spaces connecting these, such as footpaths and streets, are also public spaces. Within such reference, the study collected data mainly on the streets and footpaths to evaluate safety, accessibility and inclusion; conducted analysis of the collected data and gave recommendations to improve streets and footpaths. In addition, this project intended to provide analysed data to city stakeholders for decision making in order to make city spaces accessible, safe and inclusive by responding to the priority issues identified through the use of the Safetipin application.

The 'women safety audit of public spaces' was conducted using two application - Safetipin Nite and My safetipin. The apps provided large scale data at the street level to investigate on the challenges on safety and accessibility encountered by women while using public spaces in the area. Further it conducted analysis of the data and highlighted the issues around safety, accessibility and inclusion and provided recommendations to improve women's access to and participation in public spaces, and to meet the current and future demands of the area exclusively for public space usability. This data could be valuable source of information for both citizens and governments. The details of how the applications were used and data was produced to give recommendations for improvement are given in the following chapters.

2. SAFETY AUDIT METHODOLOGY

Safety mapping using Safetipin applications

2.1 PUBLIC SPACE AUDITS WITH MY SAFETIPIN

Two Safetipin applications are used for this project -
My Safetipin and Safetipin Nite.
My Safetipin application has the Women's Safety Audit at its core. Based on the global experience of 20 years on safety audits, 8 important parameters namely, lighting, walk path, public transport, visibility, openness, crowd, gender diversity and security that define safety perceptions are fixed. Feeling being the ninth parameter is exclusively on perception. These together help to understand the perception of safety of public spaces. A location is audited based on these nine parameters. Each safety audit results in a pin on the specific geo-tagged location where the audit was performed and also records the time and date. Results of the safety audit are aggregated to a 'Safety Score' for areas and neighbourhoods. The information on the application specifically focuses on the experience of women and girls, providing them with an interactive and empowering tool around feelings of safety.

2.2 IMAGE MAPPING WITH SAFETIPIN NITE

Safetipin Nite is an application which generates data by taking photographs of public spaces across the city using a smartphone camera which is mounted on the windshield of a moving vehicle. Photos are taken to capture pedestrian safety and accessibility conditions at regular intervals of 30-50 metres. Every picture is geo-referenced and uploaded on to a server which is further analysed by a team of visual analysts using Safetipin parameters and sub-parameters (refer text box and rubrics on parameter and sub-parameter). These eventually are translated into data sets that appear as audit points on Safetipin maps. This image bank of evidence based, geo-located (GIS) data is then shared with local stakeholders, government authorities and concerned agencies to address safety and accessibility concerns in the city.

SAFETIPIN AUDIT PARAMETERS:

Lighting *– Availability of enough light to see all around you*

Walkpath *– Either a pavement or road with space to walk*

Public Transport *– Availability of public transport like metro, buses, autos, rickshaws*

Visibility *– Vendors, shops, building entrances, windows and balconies from where you can be seen*

Security *– Presence of formal police or private guards*

People *– Number of people around you*

Gender Usage *– Presence of women and children near you*

Openness *– Ability to see clearly and move in all directions*

Feeling *– How safe do you feel*

Parameter	Score 0	Score 1	Score 2	Score 3
Lighting (Night)	**None**	**Little**	**Enough**	**Bright**
	No street or other lights	Can see lights, but there is low visibility in the area	Lighting is enough for clear visibility	Whole area brightly lit
Openness	**Not Open**	**Partly Open**	**Mostly Open**	**Completely Open**
	Many blind corners and no clear sightlines	Able to see a little ahead and around	Able to see in most directions	Can see clearly in all directions
Visibility	**No Eyes**	**Few Eyes**	**More Eyes**	**Highly Visible**
	No windows or entrances of shops or residences overlook the point	Less than 5 windows or entrances overlook the point	Less than 10 windows or entrances and vendors overlook the point	More than 10 windows or entrances and vendors overlook this point
People	**Deserted**	**Few People**	**Some Crowd**	**Crowded**
	No one in sight	Less than 10 people in sight	More than 10 people visible	Many people within touching distance
Security	**None**	**Minimal**	**Moderate**	**High**
	No guards or police visible in surrounding area	Some private security visible in surrounding area but not nearby	Private security within hailing distance	Police / reliable security within hailing distance
Walk Path	**None**	**Poor**	**Fair**	**Good**
	No walking path available	Path exists but in very bad condition	Can walk but not run	Easy to walk fast or run
Public Transport	**Unavailable**	**Distant**	**Nearby**	**Very Close**
	No metro, bus, auto/rickshaw stop within 10 mins walk	Metro or bus auto/rickshaw stop between 5-10 mins walk	Metro or bus, auto/rickshaw stop between 2-5 mins walk	Metro or bus, auto/rickshaw available within 2 mins walk
Gender Usage	**Not Diverse**	**Somewhat Diverse**	**Fairly Diverse**	**Diverse**
	No one in sight, or only men	Mostly men, very few women or children	Some women and children	Balance of all genders or more women and children
Feeling	**Frightening**	**Uncomfortable**	**Acceptable**	**Comfortable**
	Not venture here without sufficient escort	Will avoid this place whenever possible	Feel safe enough, but will be careful	Feel safe here even after dark

THE RATING RUBRIC

Image on left

The ratings for each of the parameters are defined on a scale of 0-3

2.3 DATA CODING ON SAFETIPIN PORTAL

To enhance efficiency in terms of time – quicker assessment of images; accuracy – better assessment of images; and scale – wider collection of images, Safetipin upgraded the above methodology through Machine Learning (ML). Machine learning is an application of artificial intelligence (AI) that provide systems the ability to automatically learn, adapt and improve from experience without being explicitly programmed but by using algorithms and statistical models to analyse and draw inferences from patterns in data. Thus, Machine Learning has been developed by Safetipin as the approach to automate the assessment of some of the Safetipin parameters and sub-parameters – viz., Lighting, Visibility and Gender Diversity – quickly and reliably. Please refer the complete lists and rubrics of parameter and sub-parameters given here.

SAFETIPIN'S MACHINE LEARNING MODEL:

Over the years, Safetipin has collected millions of images in cities and generated over five hundred thousand safety audits based on those images. An audit technically is labelled information of a location through assessment of photographs by rating parameters and sub-parameters. We used this large collection of labelled dataset to train the ML model.

A ML model is like a black box which by means of training, accumulates knowledge from the datasets and trains itself to rate the parameters and sub-parameters. The ML model trained by us is capable of generating scores in the same way analysts do it manually by assessing photographs.

The ML model was trained in two stages:

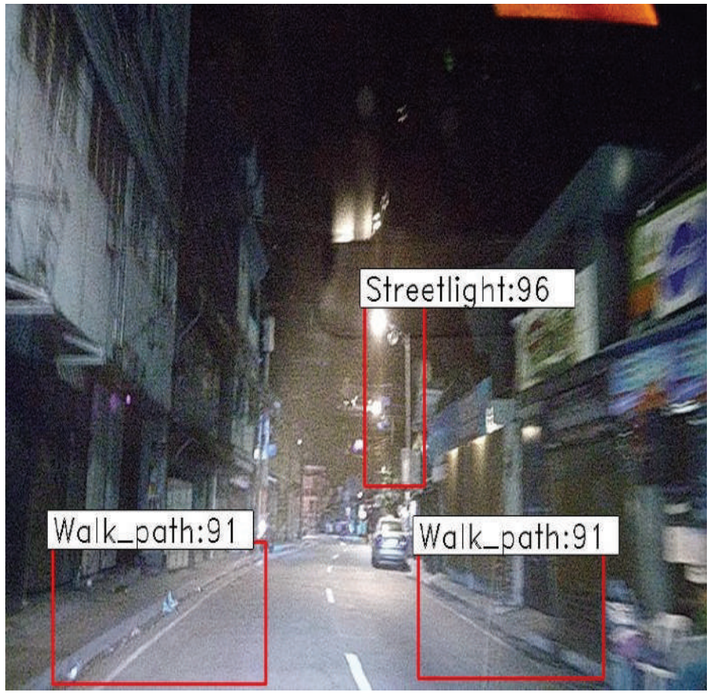
1) Training the model to detect key features:
We prepared annotated dataset of photographs which have bounding boxes (as seen in the images) around key features which were used to train the model.

Some of the key features are:
1. Pedestrians
2. Pavements
3. Streetlights
4. Lights from other sources such as,
   i. Roof lights
   ii. Lights from shops fronts, residences, buildings
   iii. Lights from hoardings, adverts, signages
   iv. Head lights of vehicles
5. Vehicles
6. Two wheeler drivers

Analysts manually look for the above mentioned features in a photograph and assign ratings for parameters and sub-parameters. The trained model was able to detect key features as visualised in the given photographs.

2) Training the model to rate parameters /sub parameter:
Using key features we further trained the model to rate Safetipin parameters and sub parameters.

Currently Safetipin uses a hybrid process of data analysis. Analysts receive audits generated by the trained ML model. An algorithm drops markers every 100 meters (red markers as seen in the screenshot below). Each marker is a ML audit having scores (aggregated ratings of parameter and sub-parameters) generated using the trained ML model. For each ML audit, the algorithm automatically analyses all photographs in the vicinity of a marker. To ensure quality and to validate the ML audits, analysts review the entire set of ML generated audits. The final audit points are then prepared as GIS datasets for further analysis and use.



ML MODEL IMAGE

Image on left

Bounding boxes showing the parameters as detected by the machine learning model

ML MODEL IMAGE

Image on left

Bounding boxes showing the parameters as detected by the machine learning model

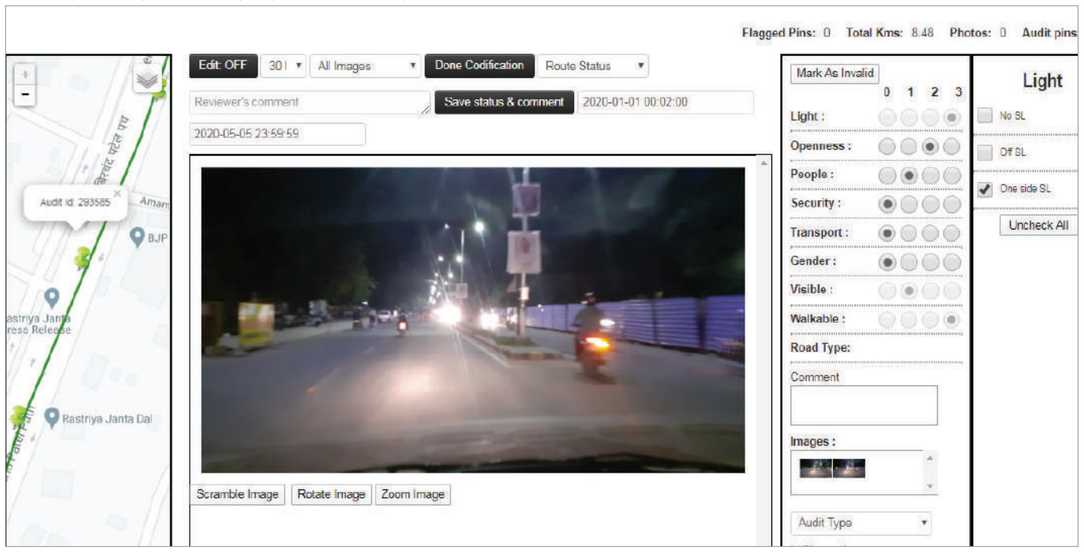
2.4 ACCESSIBILITY MAPPING WITH SAFETIPIN NITE

To gain a deeper understanding of accessibility and safety in public spaces of Dhaka, a thorough investigation on accessibility was done. Safetipin Nite was used to map the area from an accessibility perspective too. An additional set of accessibility parameters apart from the standard Safetipin parameters explained before were applied to assess the status of physical accessibility in the area especially from a user's perspective. Since walking is a basic and common means of access in the city, walkpaths which facilitate walking, become the crucial form of urban infrastructure which provides physical access to services and resources. Detail mapping of walkpaths were put together to analyse the ease of accessibility in the area. The additional accessibility parameters applied are categorised under 'Footpath Conditions' and 'Footpath Barriers' as given below.

Footpath Conditions:
Non-existent footpath
Broken, unpaved, dis-continuous footpath
Availability of curb ramps, median breaks and zebra crossings

Footpath Barriers:
Garbage, construction debris/material dumped on footpaths
Vehicles parked on footpaths
House and shop extensions onto footpaths
Temporary stalls and vendors obstructing footpaths
Light, electric, signage and advert poles obstructing footpath

Image below
Snapshot of the coding screen showing the parameters and sub-parameters



2.5 GENERATING MAPS, ANALYSES AND REPORTS

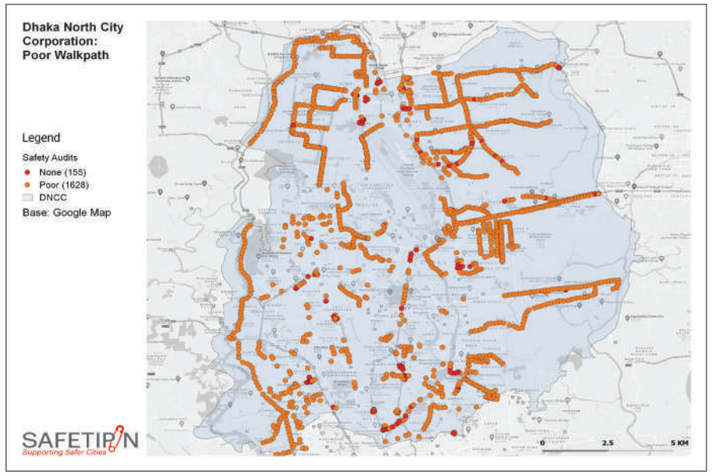
Based on the collected and coded data, the Safetipin team analyses and produces maps and reports that can be used for actual on ground responses and actions to work toward improving safety and accessibility on the streets and public spaces in cities. Maps are produced on each parameter with geo-tagged location of audit points, supported with images. These maps could be seen on Google Maps too for easier assess to information. Data is also analysed in terms of correlations and linkages with other possible data sets which further supports or reinforce the findings. Based on these analyses, a concrete set of recommendations are drawn out for key stakeholders for city improvement programs.

Lighting	Visibility	Walkpath	Security	Public Transport
No SL	50% Boundary Wall	No Pavement	Private Guards	Metro/Rail
Off SL	100% Boundary Wall	Broken Pavement	Police Van/Bike	Bus/Mini bus
Dim SL	Unused Land	Unpaved Pavement	Police Check	Auto/Shared Auto
High SL	Road side Vendors	Car Blocking	Police Booth	Cycle Rickshaw
Too Far SL	Temporary Stalls	Vendor Blocking	Police Station	Taxi
Leaves cover SL	Shops	Houses Extending	Other Govt.	Rental Bicycle
Other cover SL	Houses upto 4 Floors	Trees Blocking		
One side SL	Houses >4 Floors	Other Blocking		
		Walkable Road		
		On-street Parking		

SUB-PARAMETER RUBRIC

Image on left

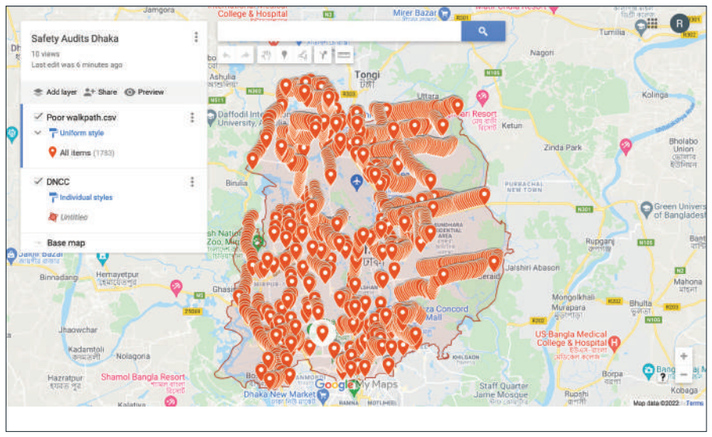
Rubric showing all the sub-parameters for the listed five parameters



DNCC'S POOR WALKPATH AS AUDIT MAP

Image on left

The map shows locations in the city where there are no or poor street lighting



DNCC'S POOR WALKPATH AS GIS LAYER

Image on left

GIS layer of street lighting on Google Maps with image links

3. DATA COLLECTION

Data collection using Safetipin applications

3.1 CITY-WIDE IMAGE MAPPING WITH SAFETIPIN NITE - ONLINE APP TRAINING AND DATA COLLECTION

Due to the COVID crisis in Dhaka, data collection was not possible for a long time. But as soon as the lockdown, night curfew and public space restrictions were lifted and vehicular movement was resumed in the city after dark, Safetipin conducted 'Online Data Collectors' Training Program' with the verified drivers and field investigators assigned by a resource agency in Dhaka. The agency - Nexel Research, hired by Safetipin, supported the Safetipin team to individually train every driver and field investigators through online sessions in order to use 'Safetipin Nite' application on the smart phones provided by Safetipin.

Over the app training sessions, Safetipin Nite App was introduced to two field investigators and two drivers who were chosen for the work. They were even trained to use the app in their personal phones as backups. Alongside, they were also trained on how to mount the phones on the windshields of the cars to do the image collection. Pre-assigned data collection routes were run on their phones and few rounds of test runs were done with the field investigators and drivers to check the accuracy of the image collection process.

A distance of 915 km were covered by the drivers and their respective field investigators in North Dhaka, collecting 52627 images of the area. Similarly, a distance of 607 km were covered in South Dhaka, collecting 34328 images. The image mapping was done between 6:30pm to 9:00pm. The quality of most of the images collected were certified good after an initial round of review by the Safetipin team and were processed for visual analysis through Machine Learning and thereafter a thorough review by the image analysts. The field investigators and drivers worked efficiently in collecting data with the help of Safetipin Nite app.

Nevertheless, we met with a few challenges. These were - on certain routes because of the road width being insufficient for vehicles it was difficult accessing them. Also, because of heavy traffic congestion and unorganised rickshaw parking on the roads, vehicular movement was slow which made the data collection process slower on almost all the roads. Apart from this we received a small percentage of shaky images due to bad road condition, water logging and rain water blurring the camera view.

Data collection details: DNCC

Total area covered: 208 Sq Km
Total road length covered: 915 Km
Image collection time: 6:30 pm to 9:00 pm
Total images collected: 52627 nos
Total audits points - 4750
Safety Score - 4.3

Data collection details: DSCC

Total area covered: 106 Sq Km
Total road length covered: 607 Km
Image collection time: 6:30 pm to 9:00 pm
Total images collected: 34328 nos
Total audits points - 3646
Safety Score - 3.8

DATA COLLECTION CAR

Image on left

Safetipin Nite app running on data collector's/ driver's smart phones

GOOD IMAGE

Image on left

Photo collected through Safetipin Nite app - an example of a good image

BAD IMAGE

Image on left

Photo collected through Safetipin Nite app - an example of a bad image

3.2 PUBLIC SPACE AUDITS WITH MY SAFETIPIN - ONLINE APP TRAINING AND DATA COLLECTION

Two women data collectors were selected by the resource agency for conducting public space safety audits. Safetipin team trained both the women data collectors through two online 'App Training' sessions. The first session of the training initiated informal discussions with the data collectors on women's safety in public spaces and the significance of safety audits. The second session was conducted on the user generated audits using My Safetipin application.

During the second session, the women data collectors were introduced with the functioning of the My Safetipin app and were helped to install the app in their smart phones. After installing the app each data collector did some trial audits to make sure that they have understood the process correctly. After trial audits were done, each volunteer was assigned with areas which were convenient for them to access and do the safety audits. These two sessions of the training complemented each other in generating quality data at the end of the audits.

100 public places comprising of transport stops/stations/ terminals, markets, street intersections (mors), institutions, parks and community centres were selected for My Safetipin audit after consulting World Bank and including suggestions from both corporations - DNCC and DSCC. Each audit location generated 10-15 audit points in and around the identified locations.

While we were able to collect good quality data but due to the ongoing pandemic, Safetipin team had to re-collect data on some locations by a second batch of data collectors as the first one could not perform the expected work. This duplication of work extended the data collection process. Women auditors at few instances were not able to audit public spaces at night because of COVID induced restrictions and safety concerns after dark.

Public spaces audited with My Safetipin app:

Community Centres - 14
New 1 Lalkuthi Community Center
New 2 Majed Sarder Community Center
New 3 Moulovi Bazar Community Center
New 4 Abdur Rahim Community Center
New 5 Nolgola Community Center
New 6 Haji Jummon Community Centre
New 7 Golam Morshed Community Centre
New 8 Lalbagh Community Center (Amligola)
New 9 New Community Center (Khilgaon Block C)
New 10 Mohanogor Natto Moncho
Repair 11 Rokonpur
Repair 12 Bongshal Community Center
Repair 13 Fakir Chand Sardar Community Center
Repair 14 Bashabo Community Center

Institution / University - 3
Bangla Academy, Dhaka University, TSC

Junctions (Mor) - 21
Airport-Hajj Camp Junction, Bangla Motor Mor, Bonoshree Mor, Gulistan Fulbaria Mor, Gulshan-Badda-Beraid Junction, Gulshan 1 Circle, Gulshan 2 Circle, Jurain Mor, Khamar Bari, Indira Road Junction, Khikhet Junction, Mirpur 10 Golchakkar, Mouchak Chowrasta Mor, Mugdapara Mor, Paltan Mor, Panthapath Mor, Sabujbagh Mor, Satrastar Mor, Science Lab Junction, Shahbag Mor, Shantinagar Mor, Uttara House Building Mor

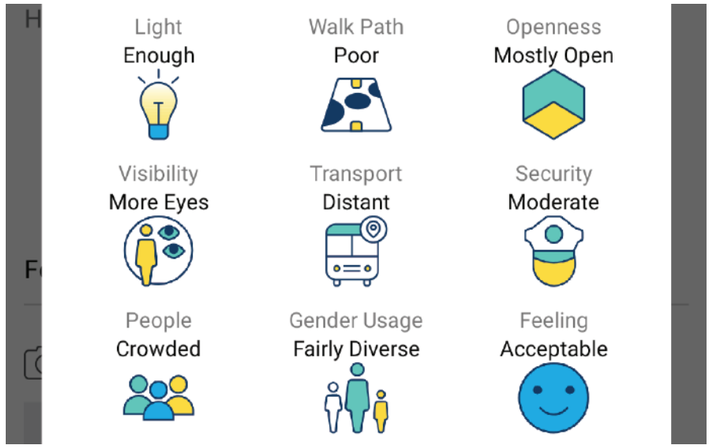
Markets -14
Bangla Bazar, Bashundhara City Shopping Complex, Chawk Bazar, Kawran Bazar, Krishi Market, Mirpur 2 Shopping complex, Mohammadpur Town Hall Market, Naya Bazar, New Market, Nilkhet Market, Palashi Bazar, Rayer Bazar Boddobhumi, Shopping Markets (opposite Dhaka College), Tanti Bazar

Parks -12
Botanical Garden, Chandrima Udyan, Dr. Fazle Rabbi Park, Jamuna Future Park, Ramna Park Sector 13 Park, Shahid Park, Sohrawardy Uddyan, Uttara Sector 3 Park, Uttara Sector 11 Park, Uttara Sector 14 Park, Uttara 12 No. Sector Park

Public Buildings - 2
Bashundhara RA Entrance Gate 1, Walkway in front of National Assembly building

Tourist Places - 6
Rabindra Sharobar, Sadarghat, Hatirjheel, Lalbagh Fort, Zero Point, Press Club

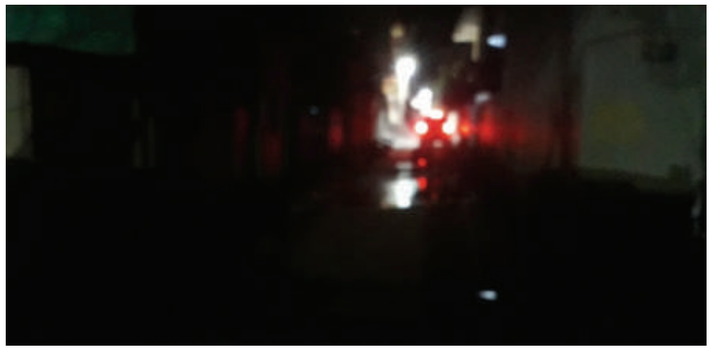
Transport Stands/Stops - 22
Azimpur Masjid Bus Stand, Bata Signal Bus Stand, Demra Bus Stand, Dhanmondi 27 Bus Stand, Farmgate Bus Stand, Gabtoli Bus Stand, Jatrabari Bus Stop, Kakoli Bus Stand, Kallyanpur Bus Stop, Kazipara Bus Stop, Malibagh Mor Bus Stop, Mirpur 1 Bus Stop, Mirpur 14 Bus Stand, Mohammadpur Bus Stand, Pallabi Bus Stand, Rampura Bus Stop, Shamoly Bus Stand, Shewra Para Bus Stand



MY SAFETIPIN SCREEN

Image on left

My Safetipin app screen showing all the nine audit parameters



BAD IMAGE

Image on left

Photo collected through My Safetipin app - an example of a bad image

GOOD IMAGE

Image on left

Photo collected through My Safetipin app - an example of a good image

4.1 WOMEN'S SAFETY AUDIT FINDINGS

Parameter maps and safety ratings

4.1.1 KEY PARAMETER MAPS OF DHAKA NORTH CITY CORPORATION (DNCC)

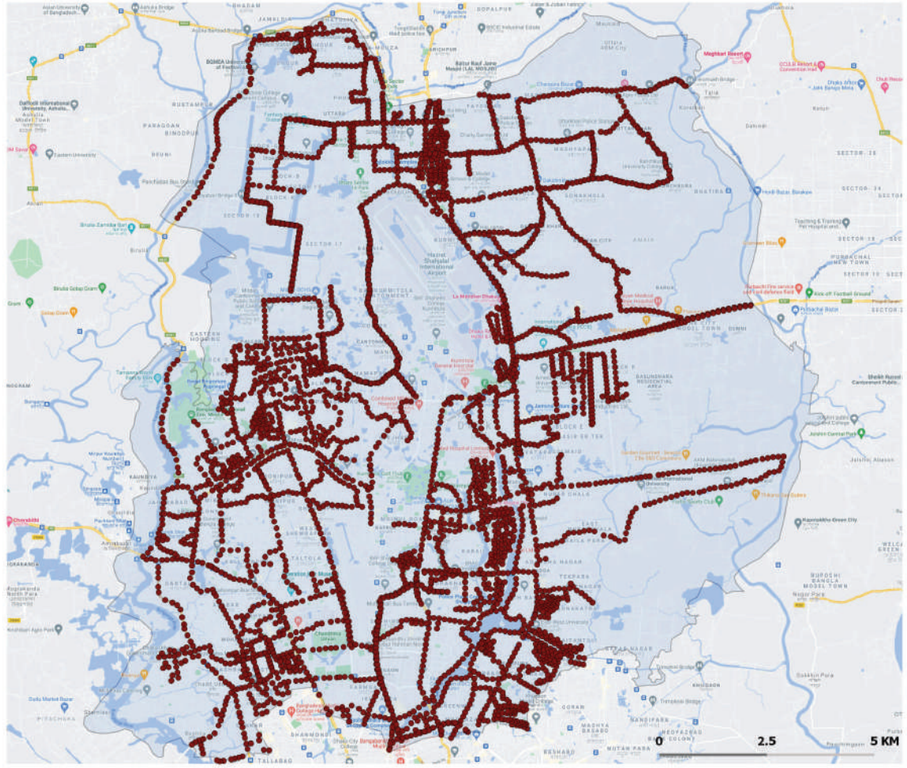
After image analysis of the collected data by Safetipin Nite in both the Dhaka Corporations, representational maps for six key parameters were prepared for data visualisation. The following parameter maps represent the data as audit points generated through image analysis methodology. The parameter maps also include public space audits points by My Safetipin. An overall map showing the aggregated Safety Score of all the parameters combined is generated for safety rating for the audited locations in Dhaka. These maps help to read and compare the data geographically and understand where the gap lies in making public spaces safe and accessible, especially for women and others. The parameter maps of DNCC are presented first, followed by parameter maps of DSCC. Overall, 4750 audit points were generated for DNCC, 4081 audit points by Safetipin Nite and 669 audit points by My Safetipin.

The map below shows the safety audit points mapped by Safetipin Nite application.

Dhaka North City Corporation: Safetipin Nite Audits

Legend
- Safety Audits (4081)
- DNCC

Base: Google Map



SAFETIPIN
Supporting Safer Cities

Comments from public space audits with My Safetipin app:

Two women data collectors audited the selected public spaces in Dhaka. As an additional layer of information they included comments for some of their audits. An assortment of comments with user insights are given below. The app allowed comments in Bangla which helped the data collectors to express their safety concerns eloquently.

"Kub kom manus aktu voy lagselo."
Very few people, felt little unsafe.
"Hata cola korte kub somossha."
Very difficult to walk here.
"Rastar pase light kub kom sob hocce dokan garir alo."
There's very less light on the streets, most light is coming from the shops and cars.

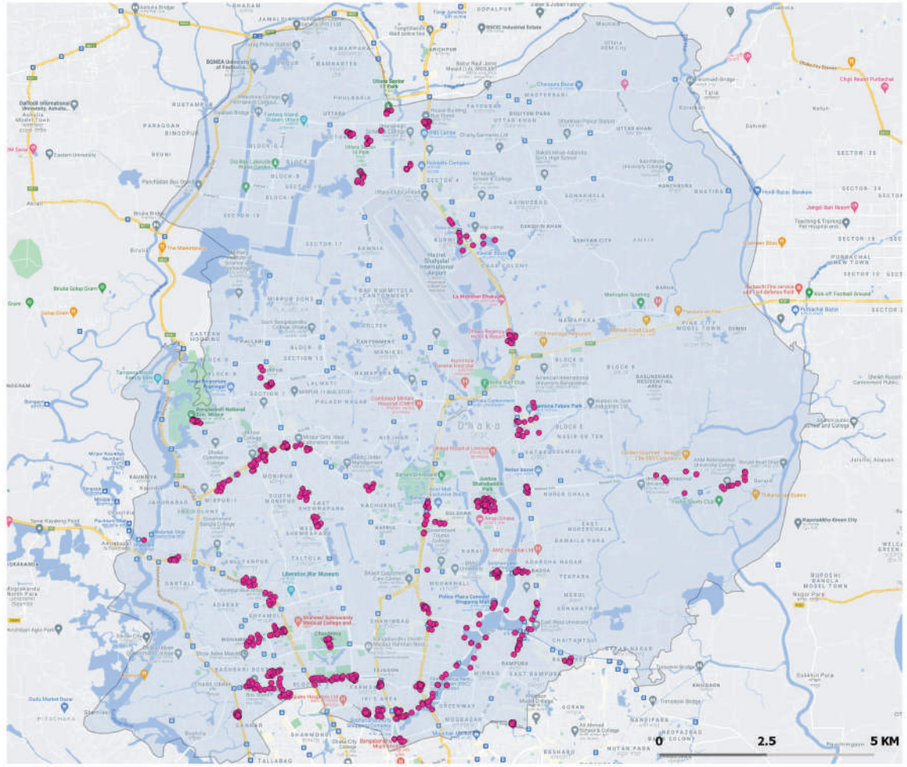
Of the nine parameters used for mapping and evaluation of public space, Lighting, Walkpath, Public Transport and Visibility are actionable parameters on which physical interventions are possible. People (presence of people on the streets), Gender Diversity (presence of women, children and others in the public domain) and Feeling (perception of safety) are used to measure the impact of the actionable parameters on safety, accessibility and inclusion in public spaces. Security and Openness are parameters which provide supplementary information for overall analysis.
Findings on the actionable parameters Lighting, Walkpath, Public Transport, Visibility are given below along with People and Gender Diversity.

The map below shows the safety audit points mapped by My Safetipin application.

Dhaka North City Corporation: My Safetipin Audits

Legend
- Safety Audits (669)
- DNCC

Base: Google Map



SAFETIPIN
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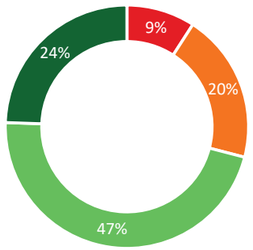
71%

OF THE AREA MAPPED HAS ADEQUATE STREETLIGHTS



71% of the area has adequate street lighting and only 29% has not any or poor street lighting. When this data is represented geographically (map below) it is seen that areas with lower ratings on street lighting are concentrated in the east and north-west peripheral areas of DNCC. Few are even sporadically spread across at a few locations within the area. This means, either there are not any or non-functional street lighting in these parts of the mapped area. This geo-located data, provided as a GIS layer, could be used for improving street lighting in the area and making it fully functional.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

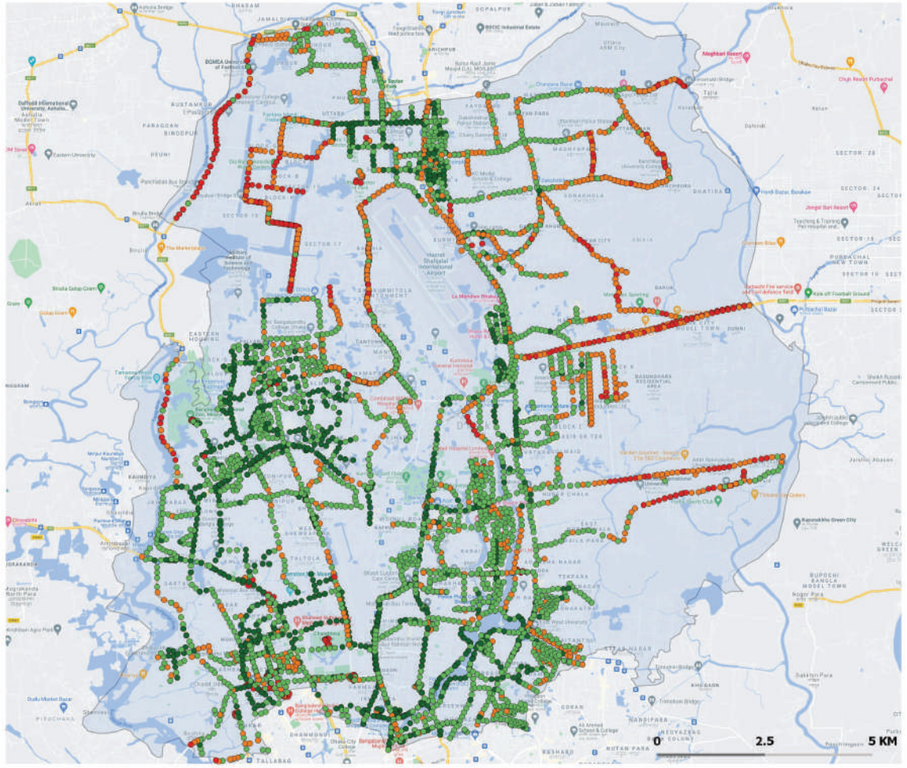
Dhaka North City Corporation: Parameter Lighting

Legend

Safety Audits
- Poor Light
- Some Light
- Enough Light
- Bright Light

DNCC

Base: Google Map



SAFETIPIN
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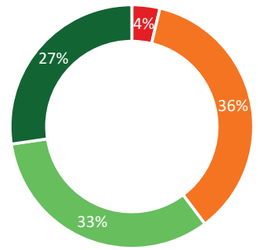
60%

OF THE AREA MAPPED HAS WALKABLE FOOTPATHS



60% of the area has walkable footpaths, rest 40% scores poorly on the same. When this data is represented geographically (map below) it is seen that areas with lower ratings on footpaths are mostly on the periphery with high concentration on the eastern and north-western areas. Few corridors and clusters with poor ratings are seen across the mapped area as well. This means, either there are not any or very poor quality footpaths in these parts of DNCC. A detailed footpath analysis follows to understand accessibility better.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

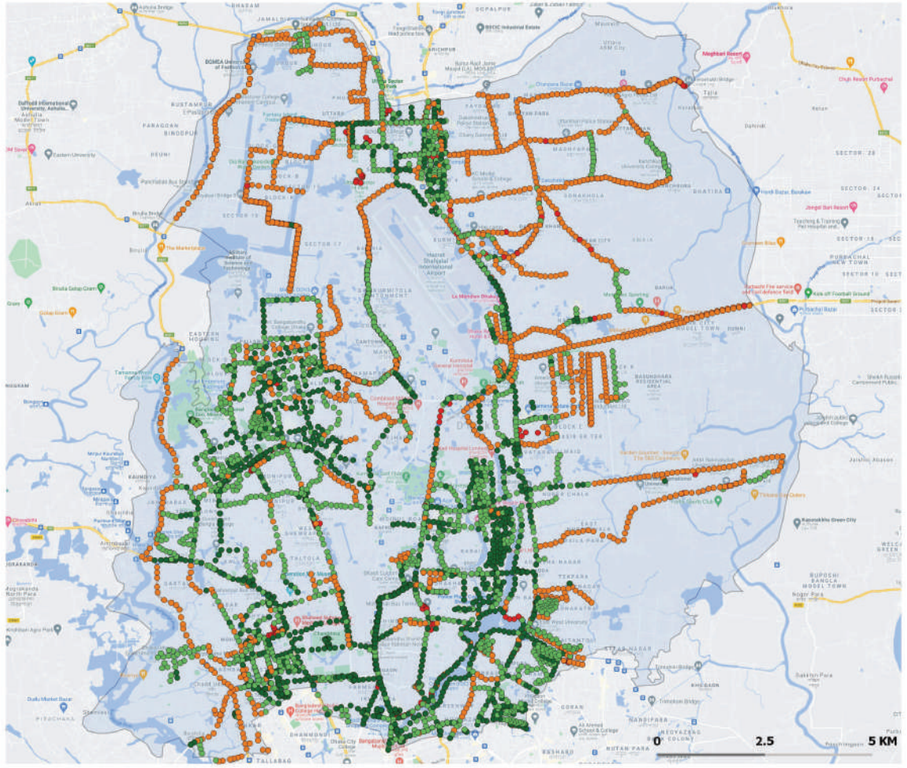
Dhaka North City Corporation: Parameter Walkpath

Legend

Safety Audits
- None
- Poor
- Fair
- Good

DNCC

Base: Google Map



SAFETIPIN
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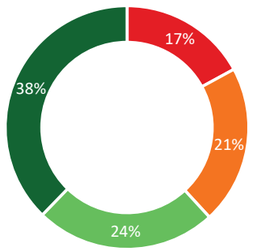
62%

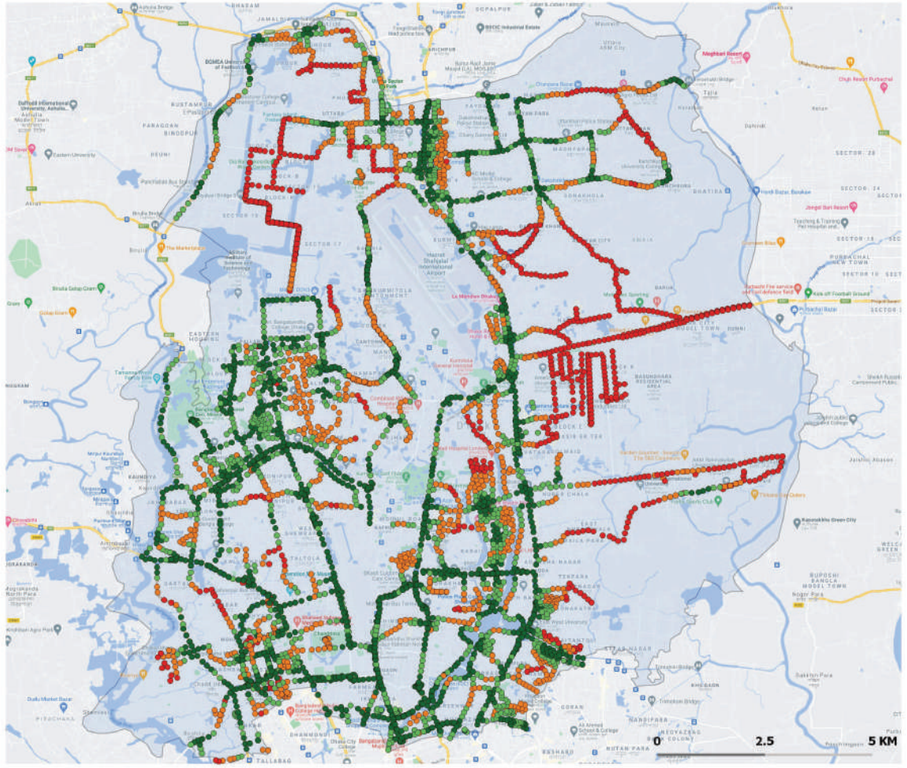
OF THE AREA MAPPED HAS PUBLIC TRANSPORT STOPS WITHIN REACH



62% of the area has public transport stands/stops within 2-5 minutes walking distance, 21% can reach them in 5-10 minutes and the rest 17% does not have any formal or informal transport stands/stops reachable within 10 minutes. When this data is represented geographically (map below) it is seen that areas with lower ratings on public transport are in clusters across DNCC and particularly in the eastern and north-western periphery. This means, formal public transport stands/stops are either unavailable or not within reach in these parts.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

Dhaka North City Corporation: Parameter Public Transport



SAFETIPIN
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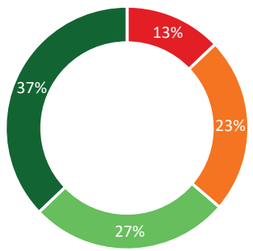
64%

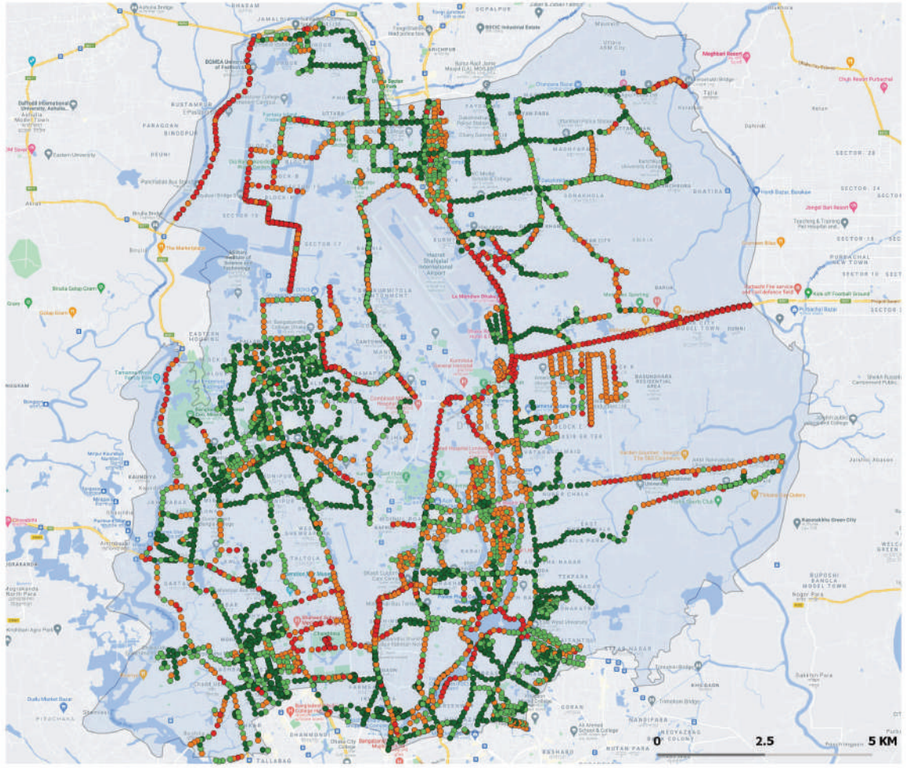
OF THE AREA MAPPED HAS GOOD VISIBILITY



64% of the area has good visibility or has active streets, i.e., these parts have less number of high boundary walls or blank facades facing the streets and have more people, vendors, shops on the streets. But 36% of the area still scores poorly on the same. When this data is represented geographically (map below) it is seen that areas with lower ratings on visibility are concentrated at the north-western and central-eastern periphery, along with a large cluster in the south. This means, either there are not any or very low visibility along these corridors.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

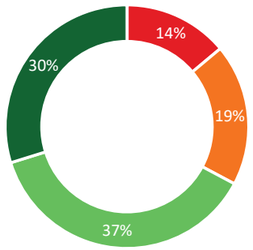
Dhaka North City Corporation: Parameter Visibility



SAFETIPIN
Supporting Safer Cities

67%

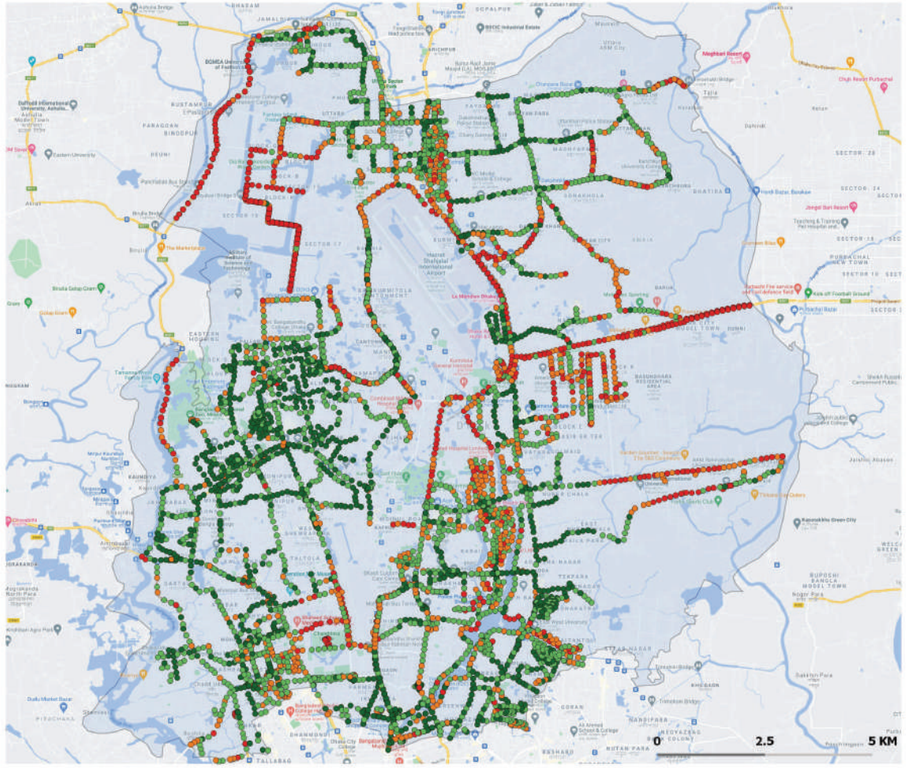
OF THE AREA MAPPED HAS GOOD PRESENCE OF PEOPLE



67% of the area had good number of people present on the streets during the time of the audit, while 19% had less than 10 people after dark and 14% were quite deserted. When this data is represented geographically (map below) it is seen that areas with lower ratings on people are at the north-western and on long stretches on the central-eastern periphery. Few clusters on the south are also seen with poor ratings. This means, either there were no or few people in these parts during the mapping. This data could be supplemented with other data sets to understand why these parts are underused.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

Dhaka North City Corporation: Parameter People



SAFETIPIN
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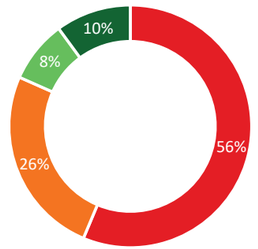
18%

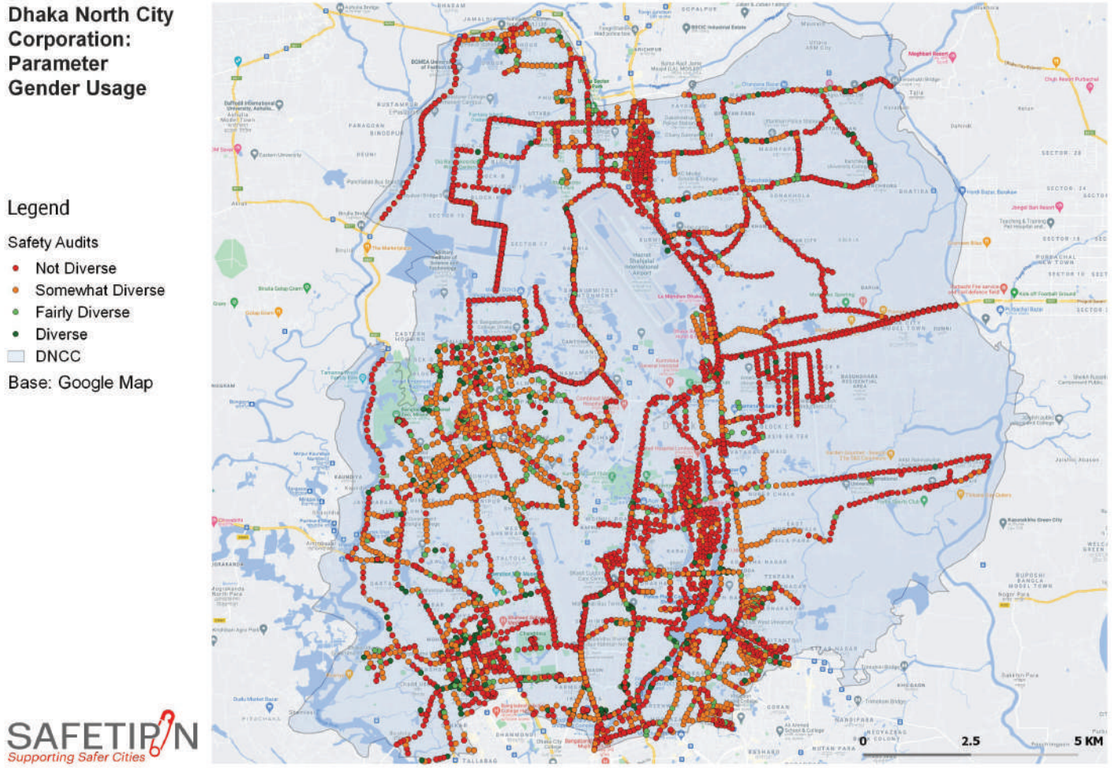
OF THE AREA MAPPED HAS PRESENCE OF WOMEN



Only 18% of the area had women and children present in public spaces during the time of the audit, rest 82% had either no or very few women and children present on the streets. When this data is represented geographically (map below) it is seen that areas with lower ratings on gender usage are evenly present across the entire DNCC area barring very few locations. This means, that there were no women and children present at night on most of the streets in the mapped area. This data too could be supplemented with other data sets to understand why streets are underused by women and children.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

Dhaka North City Corporation: Parameter Gender Usage



SAFETIPIN
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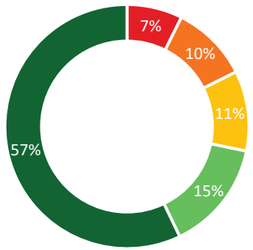
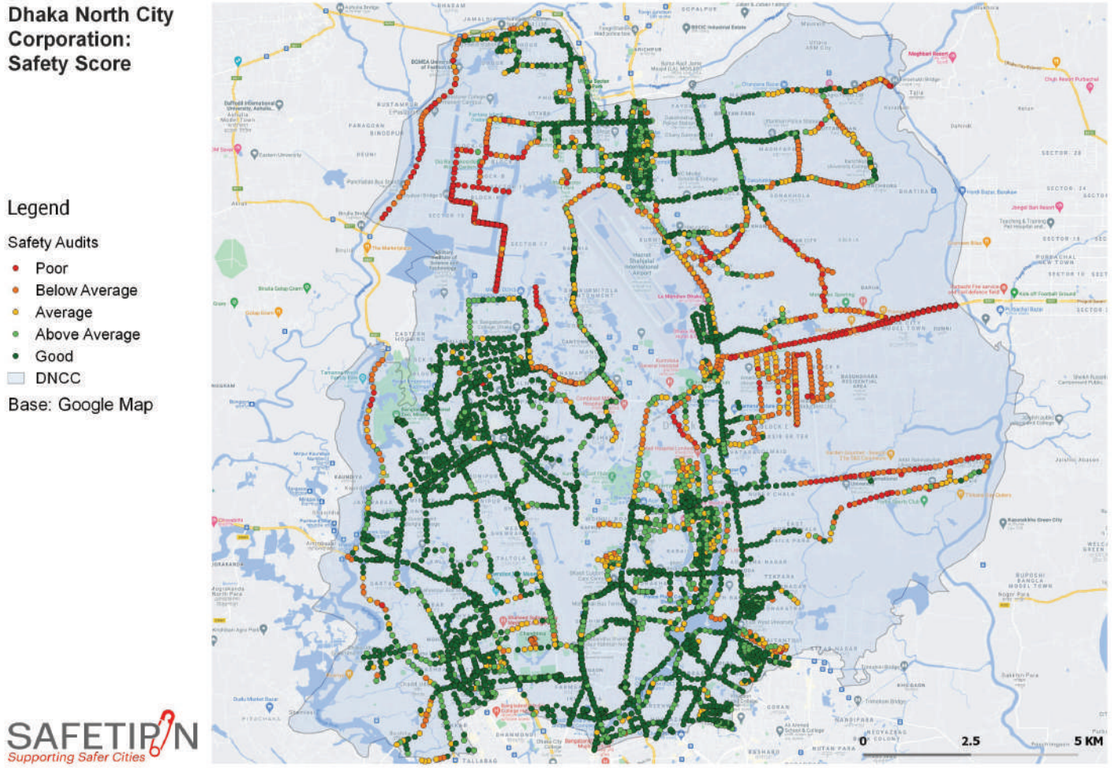
4.3/5

SAFETY SCORE OF DNCC



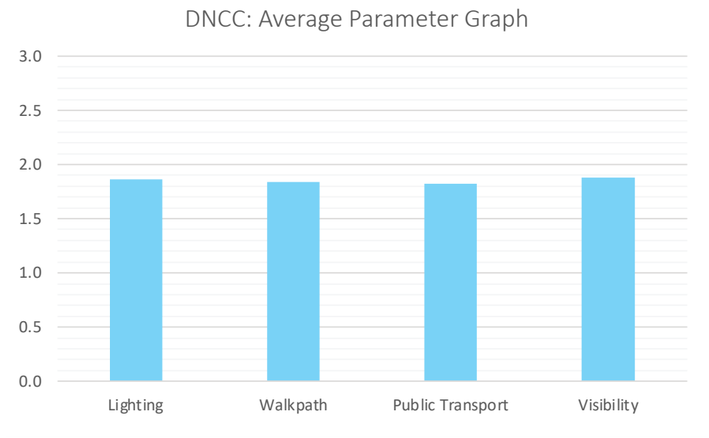
Based on the collected data, a safety score of 4.3 on a scale of 5 is given to DNCC which evaluates its status as 'above average' on safety and accessibility. The safety score map below shows some areas across DNCC with poor physical infrastructure and poor usage of public space. This means that the condition of street-lighting, footpath, visibility and public transport needs improvement at these locations and would together contribute to make DNCC safe and accessible for women and others. A thorough analysis follows to understand which of the parameters must be prioritised to improve the overall safety status of the mapped area.

On the left, percentage distribution pie of the safety score map below. Tally with the legend below.



4.1.2 GRAPHIC INTERPRETATION OF KEY PARAMETERS

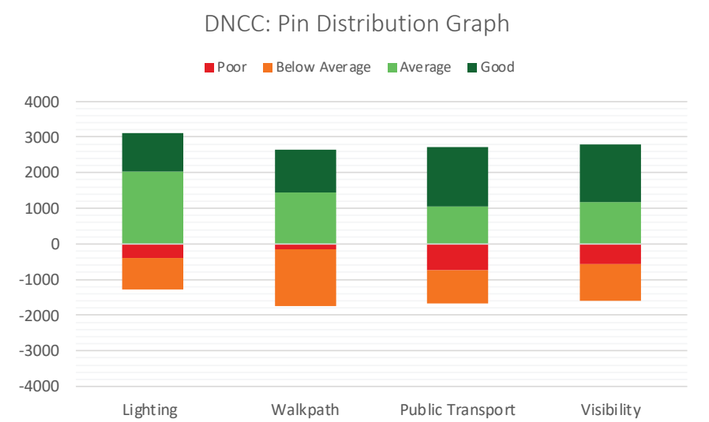
To further analyse the findings, the parameters on which physical interventions are possible are put together for data comparison. The average parameter rating graph indicates the average rating for each parameter on a scale of three. Each of the four parameters are rated either 0,1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, the Visibility parameter has been rated the highest, followed by other parameters such as Lighting and Walkpath which are rated little lower. Public Transport has been rated the lowest. The parameter wise pin distribution graph indicates the number of points rated as 0, 1, 2 and 3. The good ratings are taken as positive and poor ratings as negative. As shown on the graph, for Walkpath, Public Transport and Visibility little less than half audit points are rated below average or poor. Whereas, for Lighting over three quarter audit points are rated good or average. Further, since Lighting has the highest number of good ratings its average rating is the highest, followed by Visibility, Public Transport and Walkpath, in that order.



PARAMETER RATING

Graph top left

The graph shows average rating for each parameter on a scale of three.



PIN DISTRIBUTION

Graph bottom left

The graph shows parameter wise pin distribution on a scale of three.

4.1.3 KEY PARAMETER MAPS OF DHAKA SOUTH CITY CORPORATION (DSCC)

A set of representational maps for six key parameters were prepared for data visualisation. The following parameter maps of Lighting, Walkpath, Public Transport, Visibility, People and Gender Usage represent the data as audit points generated through image analysis methodology. The parameter maps also include public space audits points by My Safetipin. An overall map showing the aggregated Safety Score of all the parameters combined is generated for safety rating for the audited locations in DSCC. These maps help to read and compare the data geographically and understand where the gap lies in making public spaces safe and accessible, especially for women and others. Overall, 3646 audit points were generated for DSCC, 3099 audit points by Safetipin Nite and 547 audit points by My Safetipin.

The map below shows the safety audit points mapped by Safetipin Nite application.

Dhaka South City Corporation: Safetipin Nite Audits

Legend
- Safety Audits (3099)
- DSCC

Base: Google Map

SAFETIPIN
Supporting Safer Cities

Comments from public space audits with My Safetipin app:

Two women data collectors audited the selected public spaces in Dhaka. As an additional layer of information they included comments for some of their audits. An assortment of comments with user insights are given below. The app allowed comments in Bangla which helped the data collectors to express their safety concerns eloquently.

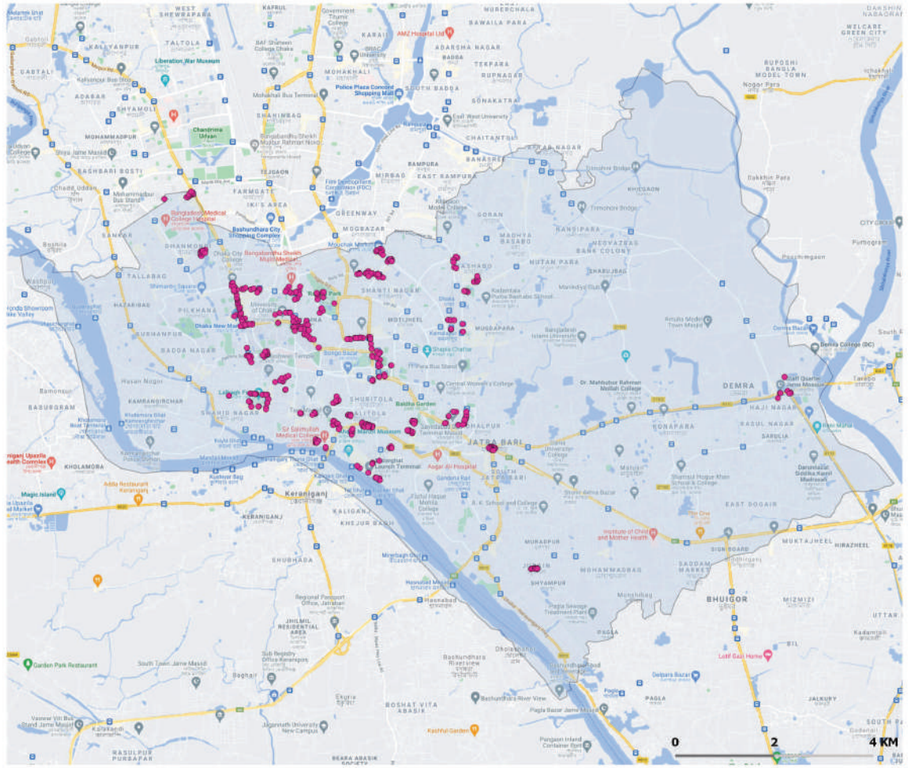
"Ratar bala aka asta voy kora."
I feel scared to come here in the night.
"Kono light nei kintu rasta gulo kub valo ace jaygata kub ondokar."
The place is very dark, no lights present but the footpaths are very good.
"Rasta gulo maje maje bangha ace kono puth path nei hata cola kora kub kosta hoy."
The road is broken at places, there are no footpaths, very difficult to walk here.
"Rast gulo kubi bangha tobe light ace onek valo."
The footpath is very broken but there's good streetlight present.
"Akane aber alo ace tobe rasta gulo kubi bangha hata cola kora kub kosta kor."
There's streetlight here but the footpath is very broken and very difficult to walk.
"Kub saru rasta hata cola kora kub koster kono lighting nei."
The road is very narrow, no street lights, very difficult to walk.
"Kub ondokar proyojon na hole astam na."
Very dark, wouldn't come here if not required.

The map below shows the safety audit points mapped by My Safetipin application.

Dhaka South City Corporation: My Safetipin Audits

Legend
- Safety Audits (547)
- DSCC

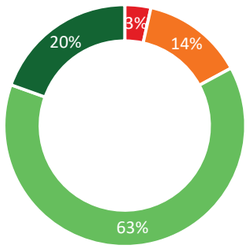
Base: Google Map



SAFETIPIN
Supporting Safer Cities

83%

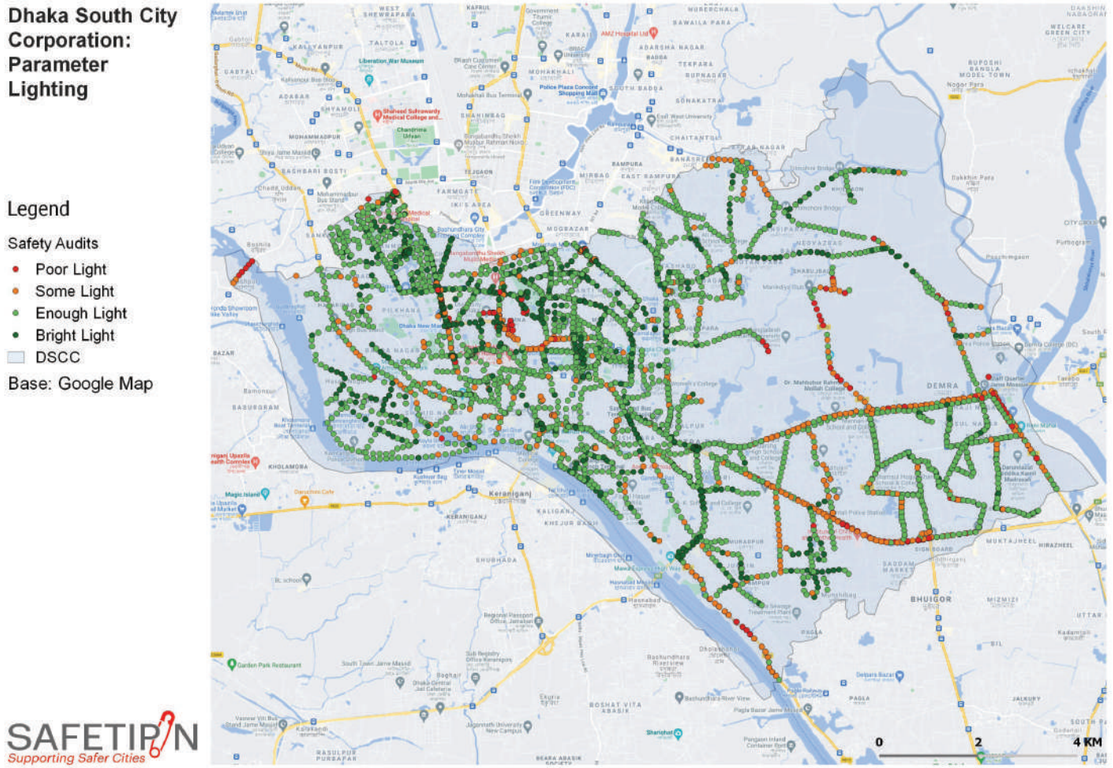
OF THE AREA MAPPED HAS ADEQUATE STREETLIGHTS



83% of the area has adequate street lighting and only 17% has not any or poor street lighting. When this data is represented geographically (map below) it is seen that areas with lower ratings on street lighting are concentrated in the south-east peripheral areas of DSCC. Few locations with such ratings are sporadically spread across within the area. This means, either there are not any or non-functional street lighting in these parts of the mapped area. This geo-located data, provided as a GIS layer, could be used for improving street lighting in the area and making it fully functional.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

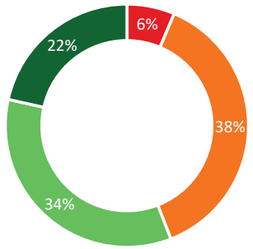
Dhaka South City Corporation: Parameter Lighting



SAFETIPIN
Supporting Safer Cities

56%

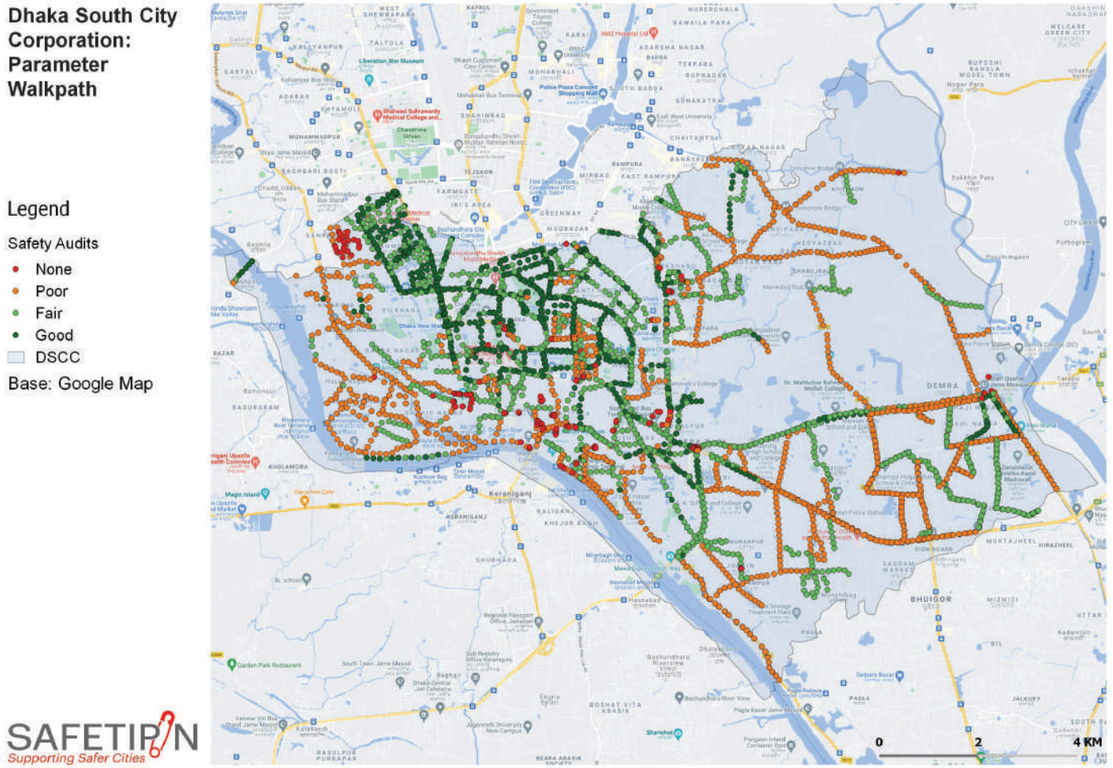
OF THE AREA MAPPED HAS WALKABLE FOOTPATHS



56% of the area has walkable footpaths, rest 44% scores poorly on the same. When this data is represented geographically (map below) it is seen that areas with lower ratings on footpaths are seen across the mapped area with an exception of a large part of the dense development in the north-west and a few corridors in the eastern periphery. This means, either there are not any or very poor quality footpaths in these parts of DSCC. A detailed footpath analysis follows to understand accessibility better.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

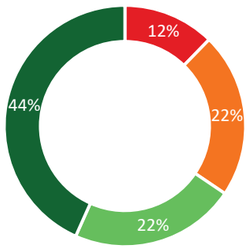
Dhaka South City Corporation: Parameter Walkpath



SAFETIPIN
Supporting Safer Cities

66%

OF THE AREA MAPPED HAS PUBLIC TRANSPORT STOPS WITHIN REACH



66% of the area has public transport stands/stops within 2-5 minutes walking distance, 22% can reach them in 5-10 minutes and the rest 12% does not have any formal or informal transport stands/stops reachable within 10 minutes. When this data is represented geographically (map below) it is seen that areas with lower ratings on public transport are in clusters in the western part and in the entire eastern periphery barring a few corridors. This means, formal public transport stands/stops are either unavailable or not within reach in these parts.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

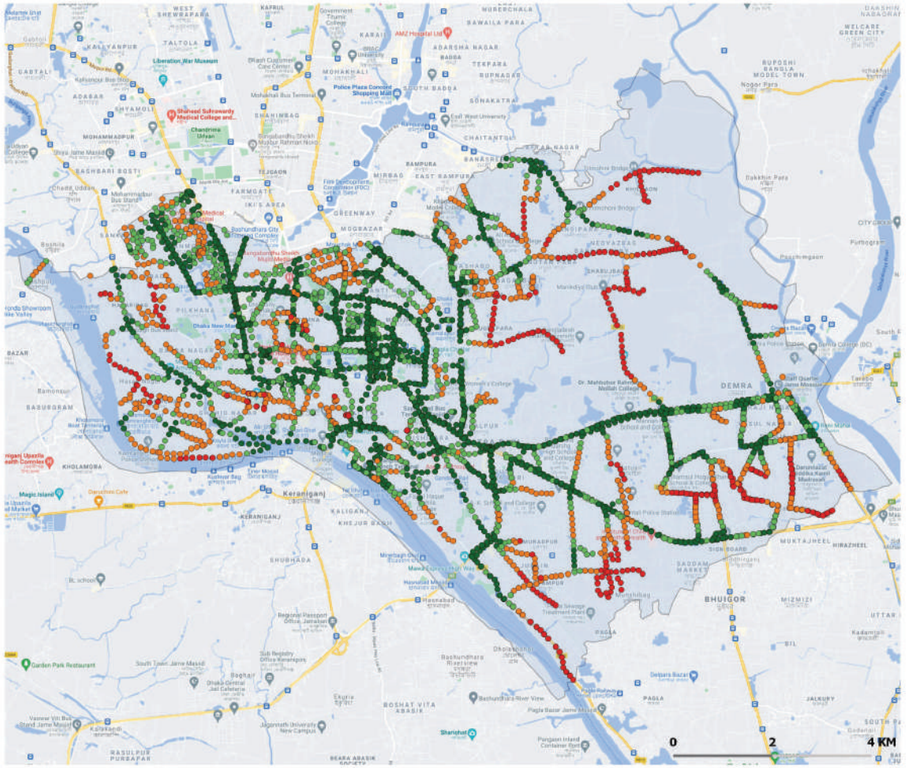
Dhaka South City Corporation: Parameter Public Transport

Legend

Safety Audits
- Unavailable
- Distant
- Nearby
- Very Close

DSCC

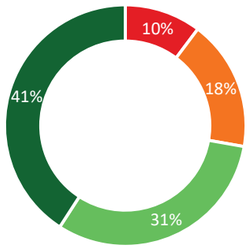
Base: Google Map



SAFETIPIN
Supporting Safer Cities

72%

OF THE AREA MAPPED HAS GOOD VISIBILITY



72% of the area has good visibility or has active streets, i.e., these parts have less number of high boundary walls or blank facades facing the streets and have more people, vendors, shops on the streets. But 28% of the area still scores poorly on the same. When this data is represented geographically (map below) it is seen that areas with lower ratings on visibility are concentrated at the center of the dense development in the west and along a few corridors in the eastern periphery. This means, either there are not any or very low visibility in these areas.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

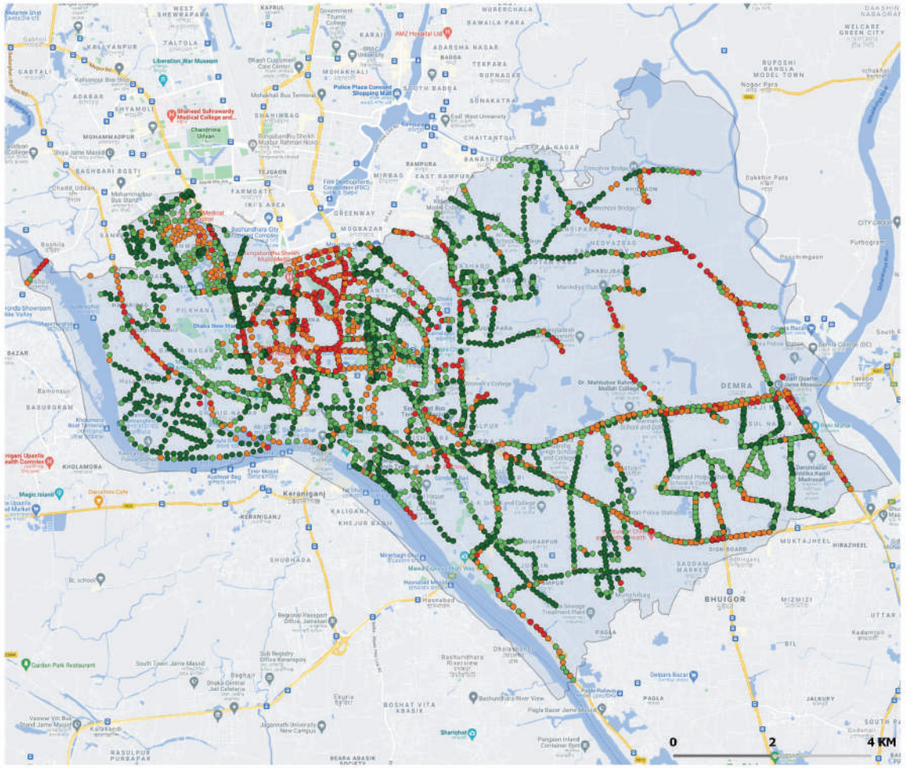
Dhaka South City Corporation: Parameter Visibility

Legend

Safety Audits
- No Eyes
- Few Eyes
- More Eyes
- Highly Visible

DSCC

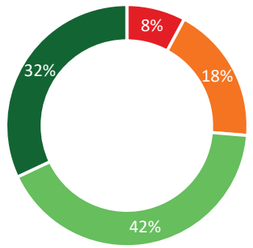
Base: Google Map



SAFETIPIN
Supporting Safer Cities

74%

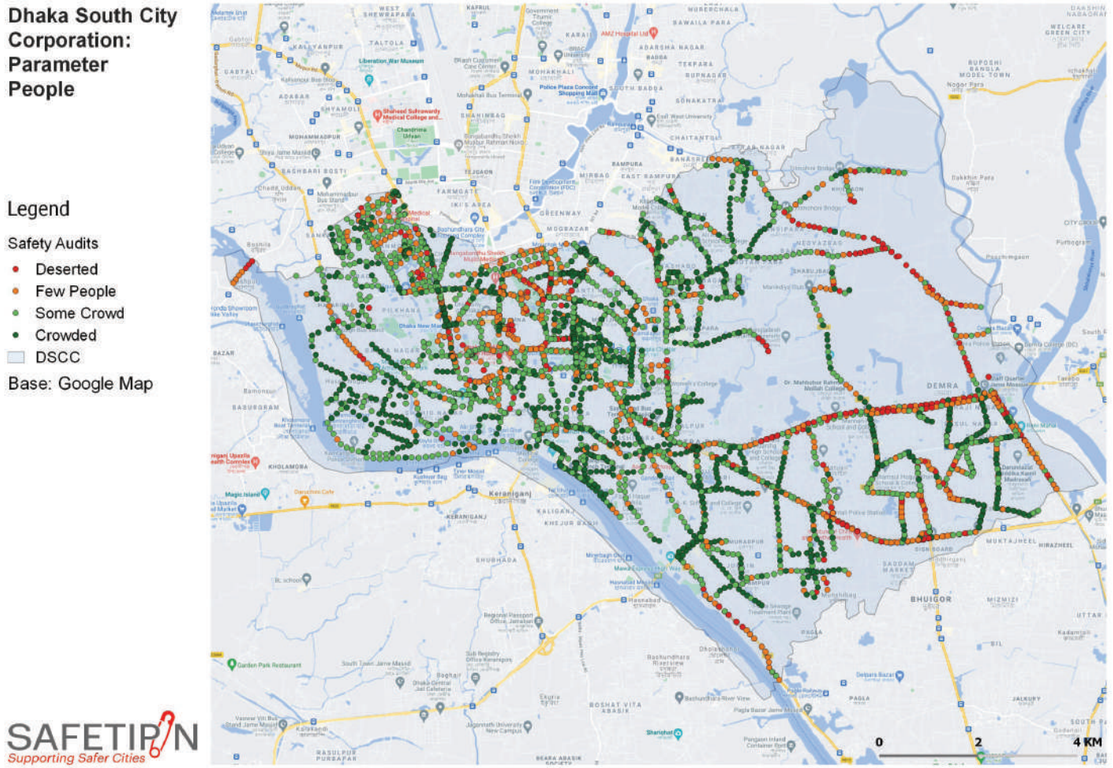
OF THE AREA MAPPED HAS GOOD PRESENCE OF PEOPLE



74% of the area had good number of people present on the streets during the time of the audit, while 18% had less than 10 people after dark and 8% were quite deserted. When this data is represented geographically (map below) it is seen that areas with lower ratings on people are at the heart of the dense development in the west and along a few stretches on the eastern periphery. This means, either there were no or few people in these parts during the mapping. This data could be supplemented with other data sets to understand why these parts are underused.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

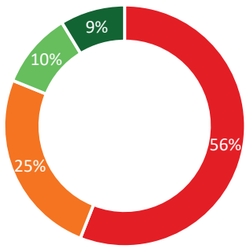
Dhaka South City Corporation: Parameter People



SAFETIPIN
Supporting Safer Cities

19%

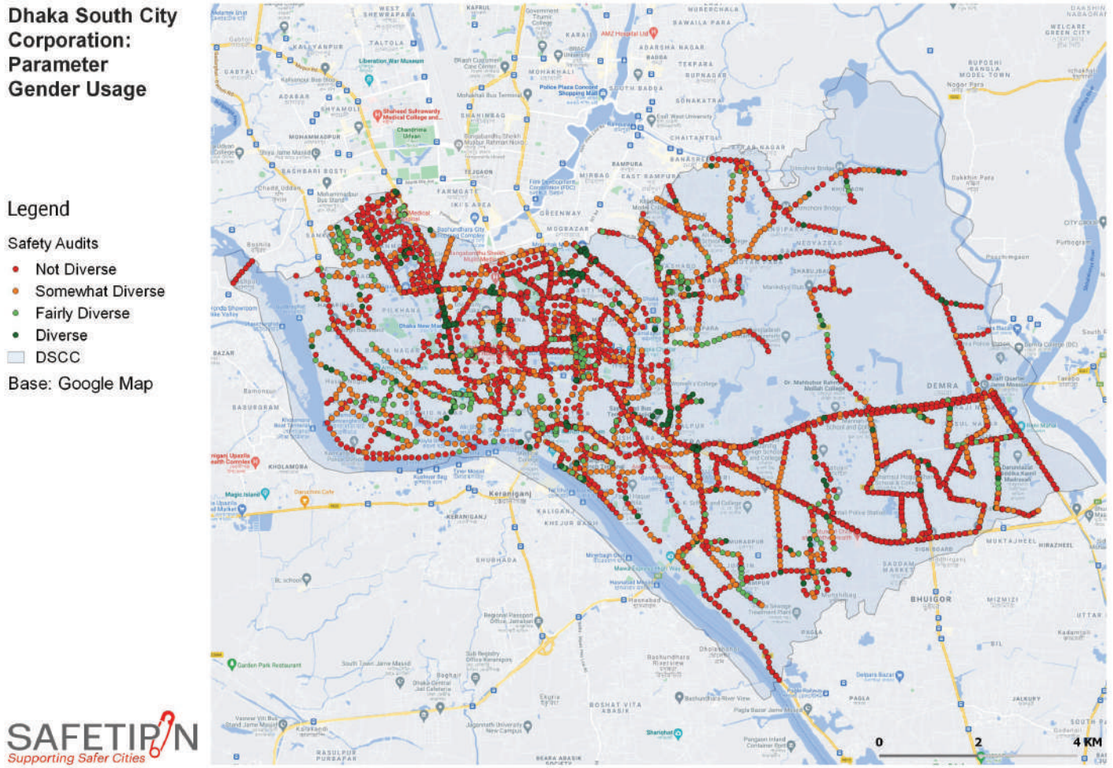
OF THE AREA MAPPED HAS PRESENCE OF WOMEN



Only 19% of the area had women and children present in public spaces during the time of the audit, rest 81% had either no or very few women and children present on the streets. When this data is represented geographically (map below) it is seen that areas with lower ratings on gender usage are evenly present across the entire DSCC area barring very few locations. This means, that there were no women and children present at night on most of the streets in the mapped area. This data too could be supplemented with other data sets to understand why streets are underused by women and children.

On the left, percentage distribution pie of the parameter map below. Tally with the legend below.

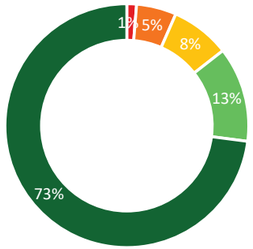
Dhaka South City Corporation: Parameter Gender Usage



SAFETIPIN
Supporting Safer Cities

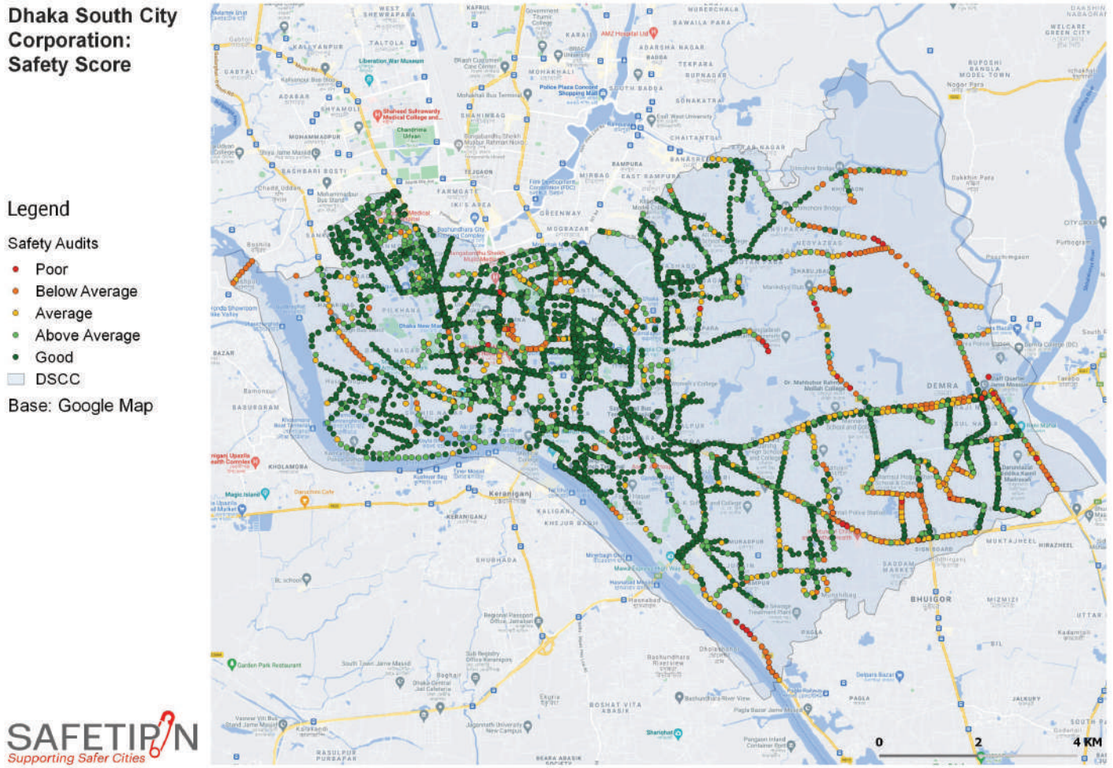
3.8/5

SAFETY SCORE OF DSCC



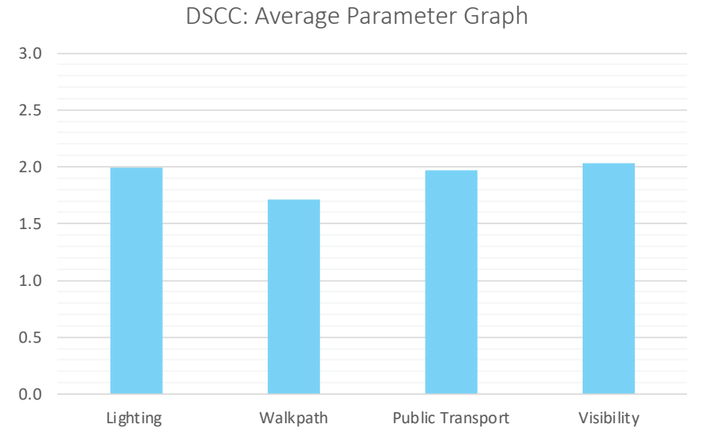
Based on the collected data, a safety score of 3.8 on a scale of 5 is given to DSCC which evaluates its status as 'above average' on safety and accessibility. The safety score map below shows some areas across DSCC with poor physical infrastructure and poor usage of public space. This means that the condition of street-lighting, footpath, visibility and public transport needs improvement at these locations and would together contribute to make DSCC safe and accessible for women and others. A thorough analysis follows to understand which of the parameters must be prioritised to improve the overall safety status of the mapped area.

On the left, percentage distribution pie of the safety score map below. Tally with the legend below.



4.1.4 GRAPHIC INTERPRETATION OF KEY PARAMETERS

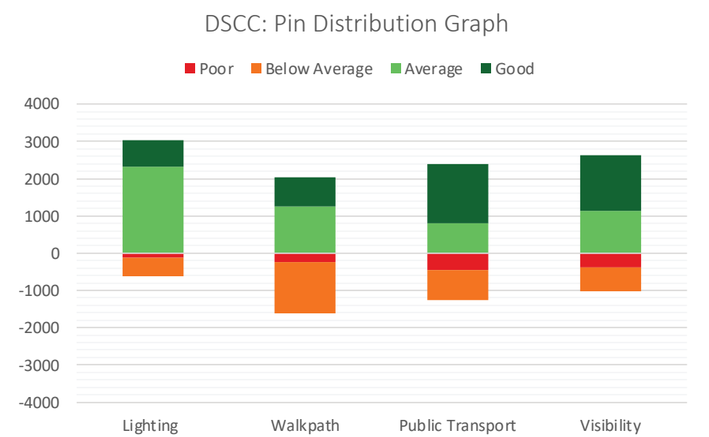
To further analyse the findings, the parameters on which physical interventions are possible are put together for data comparison. The average parameter rating graph indicates the average rating for each parameter on a scale of three. Each of the four parameters are rated either 0,1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, the Lighting parameter has been rated the highest, followed by other parameters such as Visibility and Public Transport which are rated little lower. Walkpath has been rated the lowest. The parameter wise pin distribution graph indicates the number of points rated as 0, 1, 2 and 3. The good ratings are taken as positive and poor ratings as negative. As shown on the graph, for Walkpath, little less than half audit points are rated below average or poor. Whereas, for Visibility and Public Transport, little more than half audit points are rated good or average. Further, since Lighting has the highest number of good ratings its average rating is the highest, followed by Visibility, Public Transport and Walkpath, in that order.



PARAMETER RATING

Graph top left

The graph shows average rating for each parameter on a scale of three.



PIN DISTRIBUTION

Graph bottom left

The graph shows parameter wise pin distribution on a scale of three.

4.2 ACCESSIBILITY MAPPING FINDINGS

Accessibility maps and associated findings

4.2.1 ACCESS FOR ALL

Everyone is a pedestrian. Walking is a basic and common mode of transport in all societies across the world. Virtually, every trip begins and ends with walking. Walking comprises the sole means of travel on some journeys, whether a long trip or running an errand. Therefore, footpaths are a fundamental form of urban infrastructure that facilitate walking, socializing and interacting with the public domain. In order to have a safe, barrier-free and successful trip, the street systems must be accessible to all pedestrians and especially to vulnerable users - women, children, elderly and people with disabilities using mobility devices such as wheelchairs and walkers, those who have vision, speech, hearing impairments or those with intellectual disabilities. The ease with which pedestrians can access and use streets influences their everyday life choices. A good street design which enables the user to seamlessly complete a trip from doorstep of origin to the doorstep of the destination is critical.

In the absence of accessible footpaths, pedestrians are forced to share the street with motorists which enhances the chances of pedestrian injuries, disablement and fatalities. Absence or poor condition of footpaths also drastically restrict access to public spaces, services and amenities especially for women. It has a direct impact on their mobility patterns. It influences their ability to move around, connect to wider transport networks and access the opportunities present in the city. Therefore, footpaths impact the quality of their daily life and even their life choices.

Because streets are an important component of public space, designing them with people in mind is the key. Therefore, it is important to go beyond just having a footpath, it means that careful attention must be given to providing a comfortable, safe, engaging experience to all users of the street to fulfill their daily roles and responsibilities and also to enjoy the city as pedestrians.

4.2.2 ACCESSIBILITY MAPPING OF DNCC & DSCC

To map accessibility in public spaces of Dhaka, especially for women users, data collected through Safetipin Nite application was visually analysed with an additional set of accessibility parameters apart from the standard safety parameters mentioned in the previous chapter. This was done for better understanding of the status of accessibility in both the city corporations, especially for the vulnerable groups. Images revealed the actual condition and usage of the footpaths when in maximum use during the working hours. Images also revealed the street lighting condition clearly in the evening hours apart from footpath condition and usage. Such visual findings were then put together to analyse the ease of accessing the footpaths in the city, considering walking as a primary way of access.

To map this, two sets of factors were considered to assess ease of walking on footpaths. First - to map the present condition of the footpaths. Second - to see if the footpaths are clear of any barriers or not. Based on this, the accessibility parameters considered are as given below. Composite maps are generated for each parameter with geo-tagged information which helps to assess the nature of the issues related to accessibility and locate the same for physical intervention in the city.

Accessibility parameters used for mapping:

Footpath Conditions:

Non-existent footpath

Broken, unpaved, dis-continuous footpath

Availability of curb ramps, median breaks and zebra crossings

Footpath Barriers:

Garbage, construction debris/material dumped on footpaths

Vehicles parked on footpaths

House and shop extensions onto footpaths

Temporary stalls and vendors obstructing footpaths

Light, electric, signage and advert poles obstructing footpath

CURB RAMPS

Image on left

The image shows correctly designed, located and executed curb ramps.

ZEBRA CROSSING

Image on left

The image shows correctly designed, located and executed pedestrian crossings.

MEDIAN BREAK

Image on left

The image shows correctly designed, located and executed median breaks.

4.2.3 DNCC: MAPPING OF FOOTPATH CONDITIONS

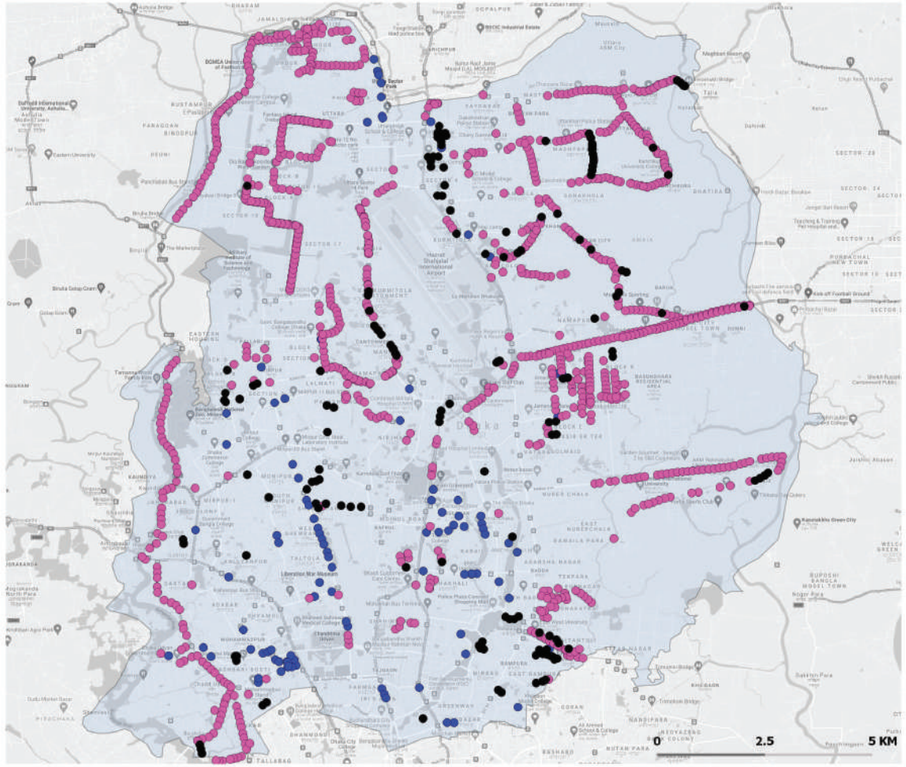
Safetipin identified three types of footpath conditions which mar pedestrian walking experience and cause distress among pedestrians while navigating the streets, especially the vulnerable users. These conditions are namely, one, having no dedicated walking space on the streets, two, having no built footpath, and three, having broken, partly paved, discontinuous walking surface on footpaths. We mapped all of the above conditions wherever found in the area and geo-located the information on GIS layers. The composite map below represents all the non-functional footpaths as found on the streets and highlights the intensity of the issue in Dhaka North City Corporation.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show non-functional footpaths

Dhaka North City Corporation: Footpath Conditions



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4.2.4 DSCC: MAPPING OF FOOTPATH CONDITIONS

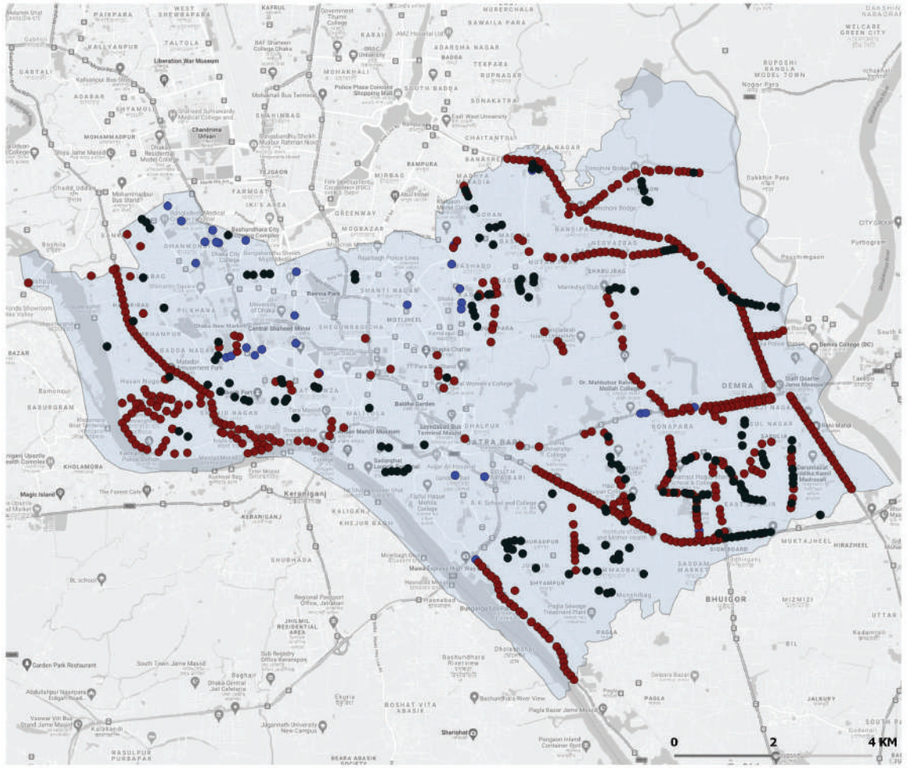
Similarly, the composite map below represents all the non-functional footpaths as found on the streets and highlights the issue of ease of access and mobilty in Dhaka South City Corporation. Please follow the legend to see the total number of locations where these conditions were identified. As mentioned, this geo-located data is also provided as a GIS layer and could be used for improving walkability in the area.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show non-functional footpaths

Dhaka South City Corporation: Footpath Conditions



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4.2.5 DNCC: MAPPING OF ACCESSIBILITY ELEMENTS

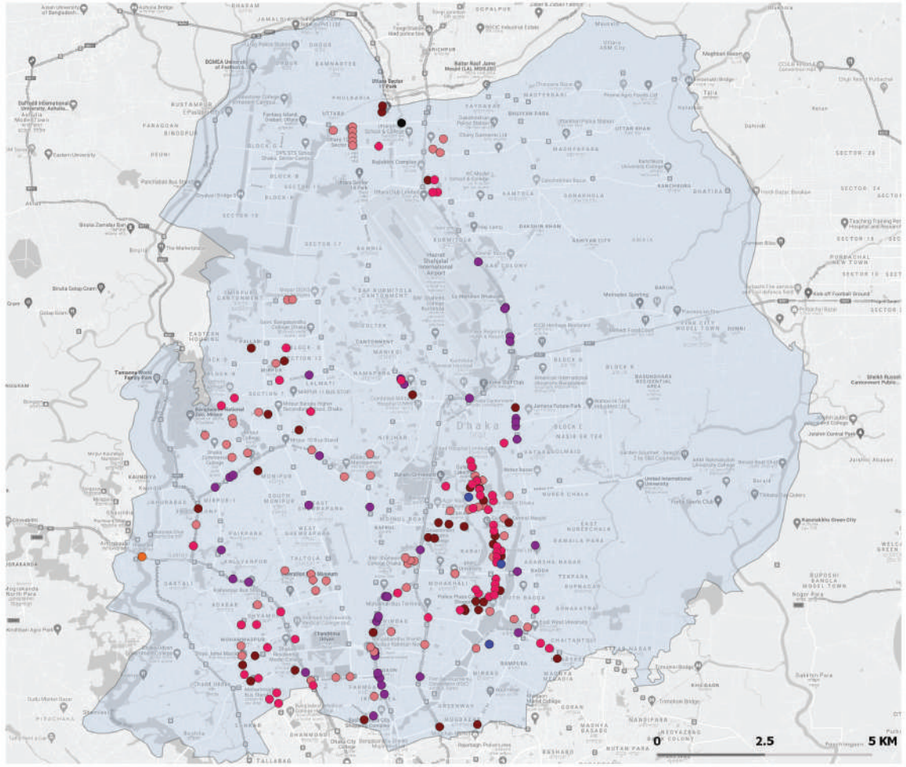
Safetipin identified five types of physical elements which assist pedestrians to have at grade walking experience, especially the vulnerable users. These are namely tactile tiles, pedestrian ramps, curb ramps, median breaks and zebra crossings. We mapped all of the above wherever found in the area and geo-located the information on GIS layers. The composite map below represents all the accessibility elements found on the streets and highlights the complexity of the issue of having inadequate curb ramps, median cuts and pedestrian crossings for a seamless, at grade walking experience. One pedestrian underpass and 43 foot-over bridges were located. Most of the accessibility elements were found on the southern end of DNCC within the dense urban settlements.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show accessibility elements on streets

Dhaka North City Corporation: Accessibility Elements



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4.2.6 DSCC: MAPPING OF ACCESSIBILITY ELEMENTS

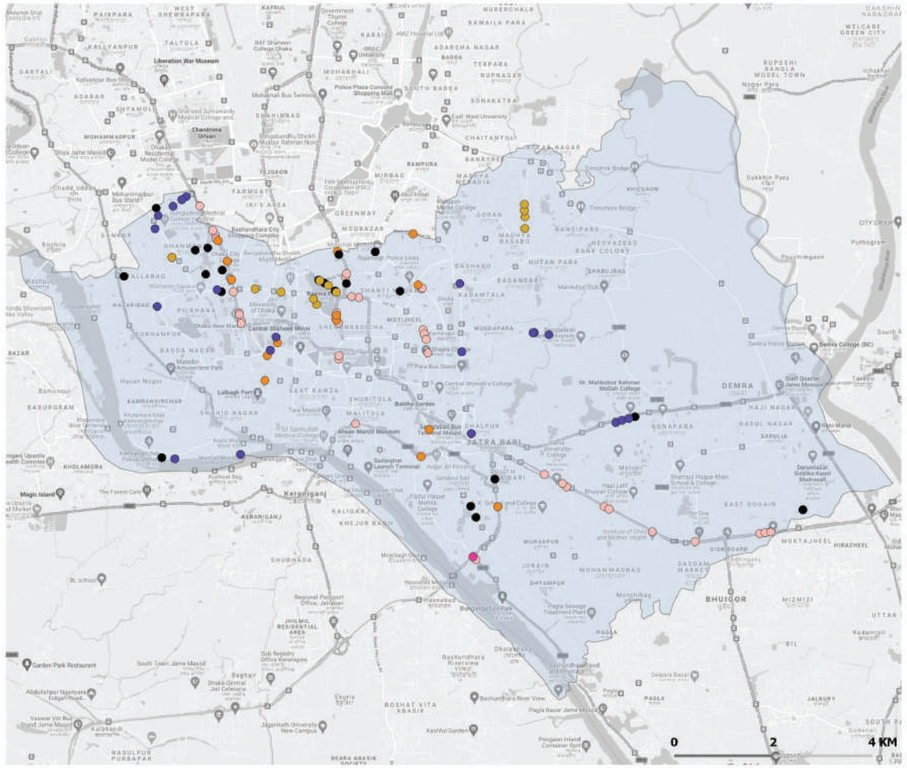
Similarly, the composite map below represents all the accessibility elements as found on the streets and highlights the issue of ease of access and mobilty in Dhaka South City Corporation. Please follow the legend to see how inadequately these accessibility elements are present at only a few locations in the area. Most of the accessibility elements were found on the western side of DSCC within the dense urban settlements. This geo-located data is also provided as a GIS layer and could be used for improving walkability in the area.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show accessibility elements on streets

Dhaka South City Corporation: Acessibility Elements



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4.2.7 DNCC: MAPPING OF FOOTPATH OBSTRUCTIONS

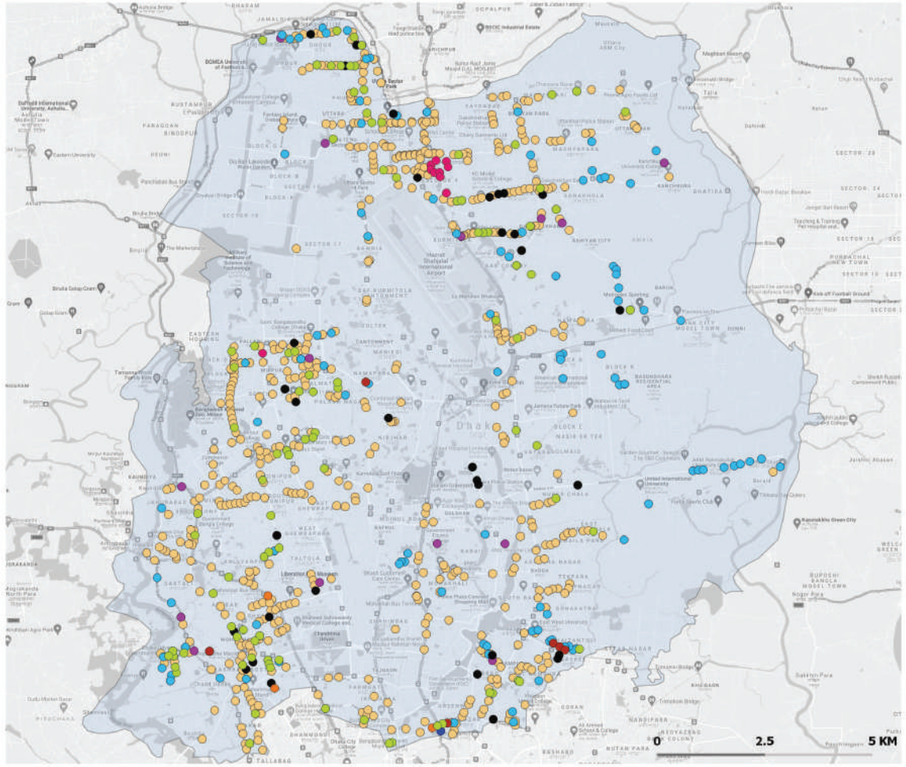
Safetipin identified five types of physical barriers disrupting clear walking space for pedestrians, especially the vulnerable users. These are namely parked vehicles, shop/house extensions, temporary stalls/ vendors, electricity/signage poles, and lastly dumped garbage/construction material. We mapped all of the above when found on footpaths and geo-located the information on GIS layers. The composite map below represents all barrier types found on footpaths and shows the magnitude of the issue. The total number of locations where these obstructions are found are indicated in the legend.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show obstructions on footpaths

Dhaka North City Corporation: Footpath Obstructions



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4.2.8 DSCC: MAPPING OF FOOTPATH OBSTRUCTIONS

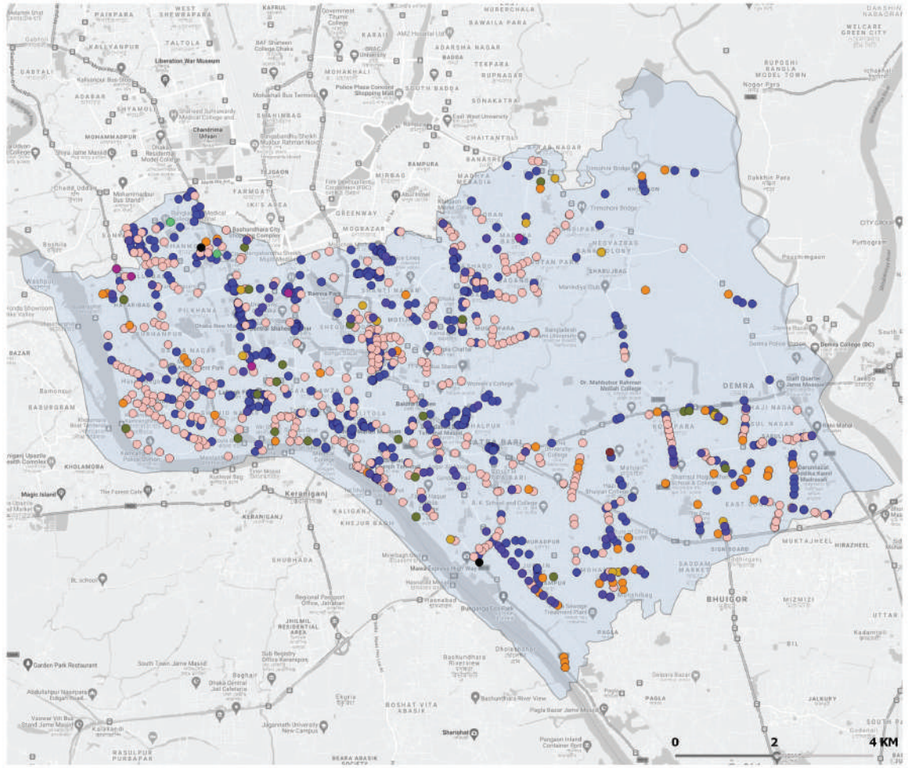
Similarly, the composite map below represents all barrier types found on footpaths and shows the magnitude of the issue of accessibility and mobility in Dhaka South City Corporation. Please follow the legend to see the total number of locations where these obstructions were identified. As seen, the obstructions are present across the entire area and the presence of vendors/temporary stalls posing as obstructions are the highest, in both the corporations. This geo-located data is too provided as a GIS layer and could be used for removing obstructions and improving walkability in the area.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show obstructions on footpaths

Dhaka South City Corporation: Footpath Obstructions



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4.2.9 DNCC: MAPPING OF FOOTPATH OBSTRUCTIONS - PARKING

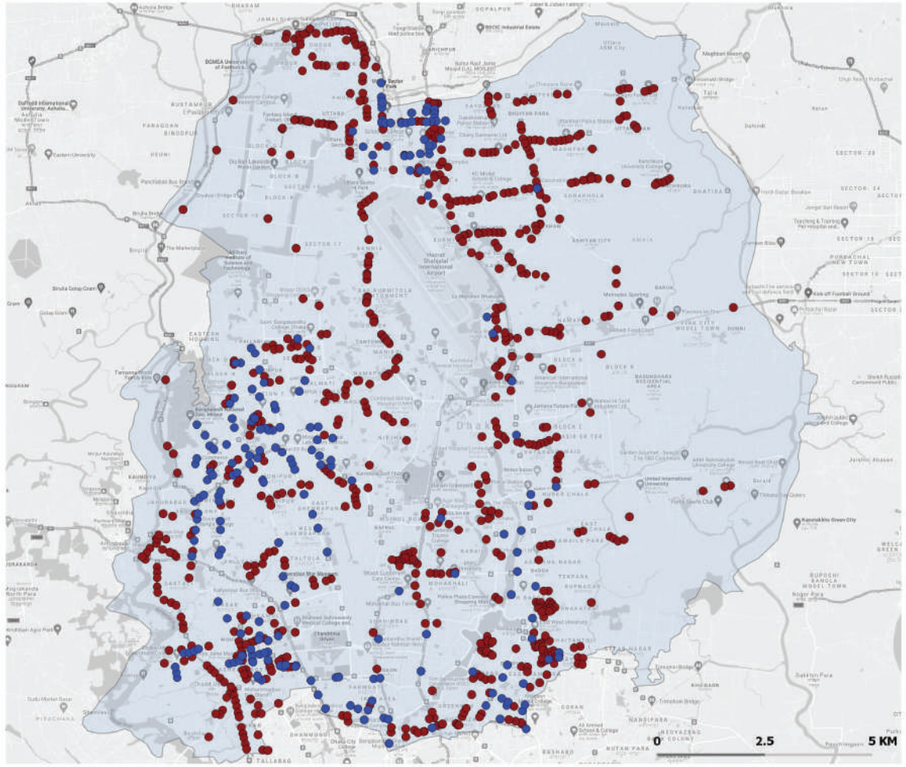
Safetipin identified locations within the corporations where vehicles were parked on footpaths, disrupting clear walking space for pedestrians, especially the vulnerable users. These are mainly two wheelers, four wheelers, small delivery vehicles, rickshaws, carts and cycles. We also mapped clusters of non-motorised vehicles, mainly rickshaws parked on the vehicular roads obstructing assess to footpaths and causing traffic congestion. These conditions were mapped and such geo-located information is available as GIS layers. The map below represents all locations in DNCC with parked vehicles on footpaths and beside footpaths to highlight the intensity of the issue. It is found that majority of the footpaths were either occupied by obstructions, were difficult to access or did not have a good, at grade, walking surface.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show parked vehicles on footpaths

Dhaka North City Corporation: Footpath Obstructions



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4.2.10 DSCC: MAPPING OF FOOTPATH OBSTRUCTIONS - PARKING

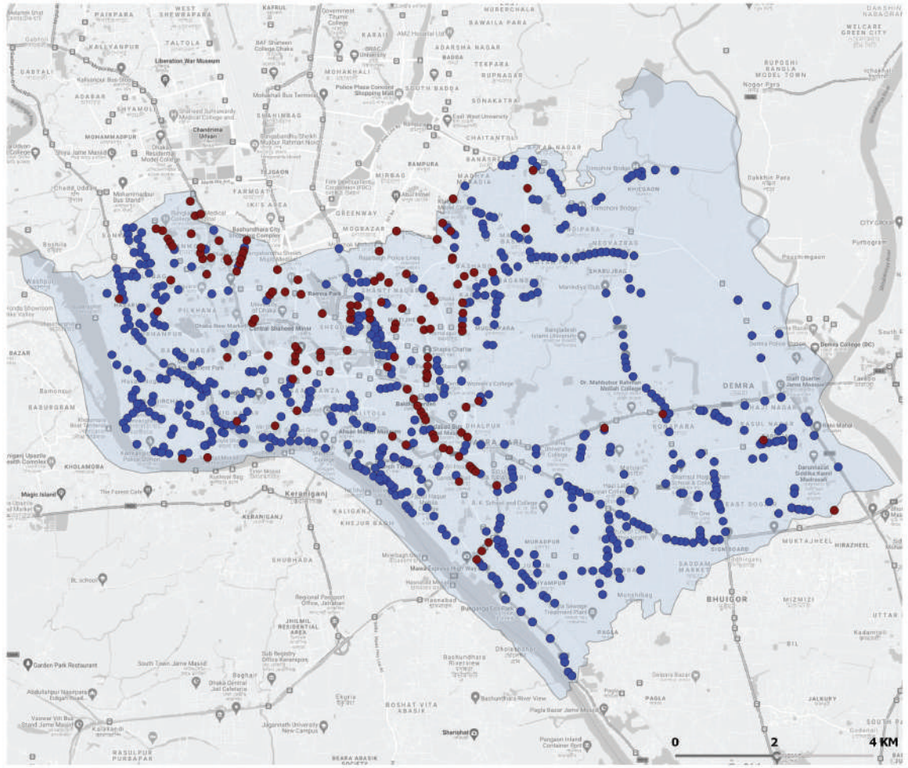
Similarly, the map below represents all locations in DSCC with parked vehicles on footpaths and beside footpaths to highlight the intensity of the issue. Please follow the legend to see the total number of locations where motorised and non-motorised vehicles were parked. This geo-located data is too provided as a GIS layer and could be used for removing obstructions and organising parking to improve walkability in both the city corporations.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show parked vehicles on footpaths

Dhaka South City Corporation: Footpath Obstructions



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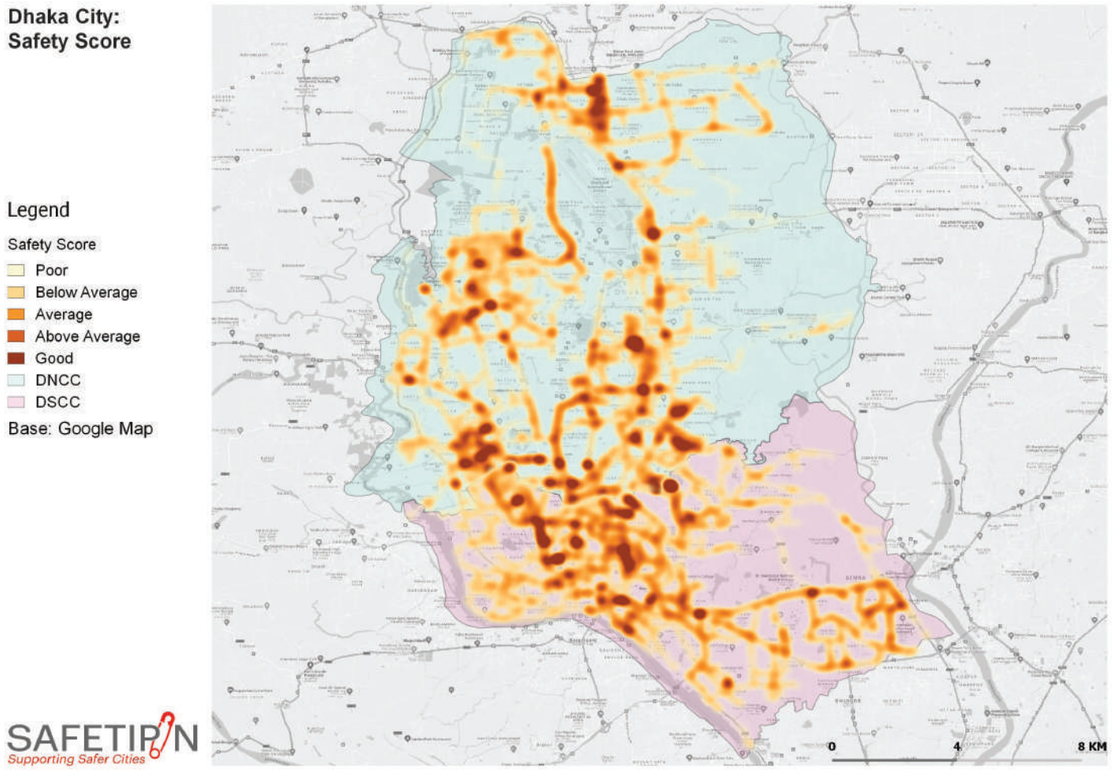
4.3 DATA ANALYSIS

Data representation and correlation maps

To further analyse the data layers generated by Safetipin and to gain a deeper understanding of the spatial issues related to safety and accessibility, some data layers were overlaid onto other data layers. This helped in understanding their relationship with each other and how they interacted with space. Such understanding could be applied to inform decision making for spatial interventions. The following correlation maps explore this understanding at a spatial level. Safetipin also looked at representation of data layers by grouping and segregating them. For example the Safety Score heat map below illustrates Safety Scores generated throughout DNCC and DSCC and can be used by the development authorities to prioritise on the location which appear light yellow on the map and have scored below average or poor on safety and accessibility.
A set of recommendations for both corporations, on the actionable parameters for immediate improvement which would positively impact the safety scores, is included in the next chapter.

Dhaka Safety Score map below showing poor and below average safety score in various locations.



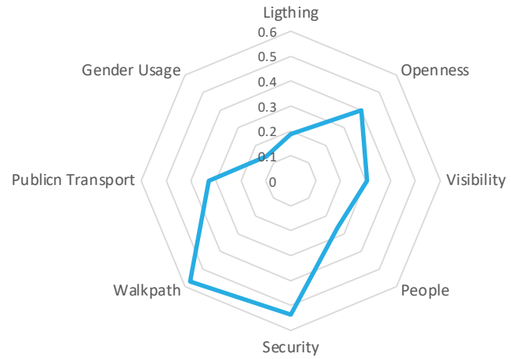
4.3.1 KEY PARAMETERS IMPACTING SAFETY PERCEPTIONS

The graph below indicates the correlation drawn between each of the eight parameters with respect to feeling, the ninth parameter. In case of Dhaka, 'My Safetipin' audits show Walkpath, Security and Public Transport to be rated the highest when correlated with feeling. This clearly shows the strong relationship of these parameters to women's perception of safety. Visibility have been rated high as well. Lighting however has been rated lower. The reason for this could be presence of good lighting in the denser urban settlements in both Dhaka corporations - DNCC (71%) and DSCC (83%) - as mapped in the Lighting parameter. This analysis helps in identifying the key actionable parameters on which physical intervention is possible and would have a positive impact on women and other vulnerable users of public space.

CORRELATION GRAPH

Graph on right

The graph shows each parameter correlation with the Feeling parameter



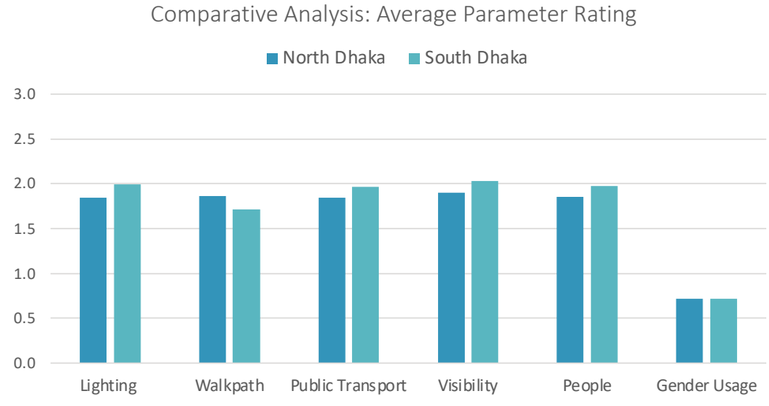
4.3.2 COMPARING DNCC AND DSCC KEY PARAMETERS

Audits generated using 'Safetipin Nite' in DNCC and DSCC were compared for six key parameters - Lighting, Walkpath, Public Transport, Visibility, People and Gender. It is seen that Lighting, Visibility, Public Transport and People have similar average ratings but Walkpath in DNCC has better average ratings than DSCC. Similarly, average rating for Gender is lower in both the city corporations but they are similar, indicating women participation in public spaces to be poor after dark.

COMPARATIVE RATING

Graph on right

The graph shows average rating of key parameters for DNCC and DSCC audits



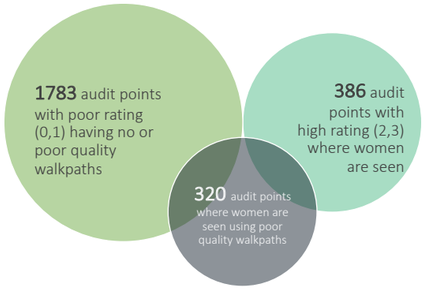
4.3.3 DNCC: CORRELATING GENDER USAGE WITH WALKPATH

Safetipin overlaid 'presence of gender in public spaces' data on 'walkpath' data, generated by Safetipin's visual mapping analysis. This is done to geographically locate the areas where women and others are seen using walkpaths with various obstructions. The heat map below clearly illustrates this correlation. The dark green areas are where walkpath is good and the light green areas are where walkpath is non-existent or of poor quality. The blue dots are the audit points showing presence of gender. There are all together 142 audit points identified in DNCC where women can be seen accessing the streets where the walkpath condition is poor. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images. Such photographic evidence could be used for deeper investigation into the area's walking infrastructure and improve accessibility in public spaces. A good walking environment will improve women's mobility and access to opportunities, resources and services.

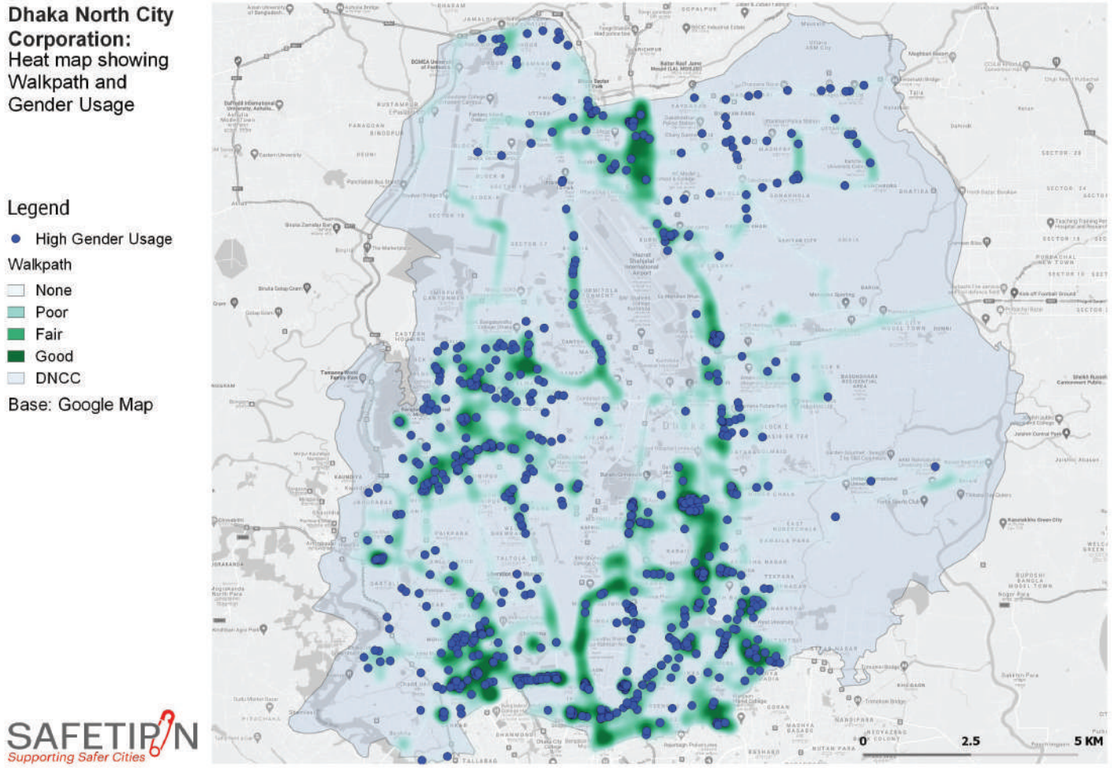
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and walkpath



Dhaka North City Corporation:
Heat map showing Walkpath and Gender Usage



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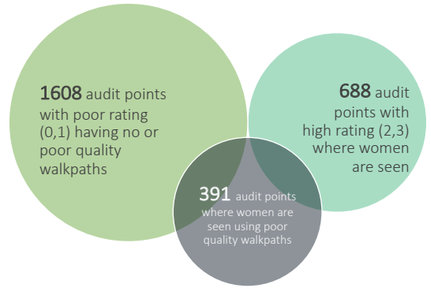
4.3.4 DSCC: CORRELATING GENDER USAGE WITH WALKPATH

Similarly for DSCC, all together 142 audit points were identified, where women can be seen accessing the streets where the walkpath condition is poor. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images.

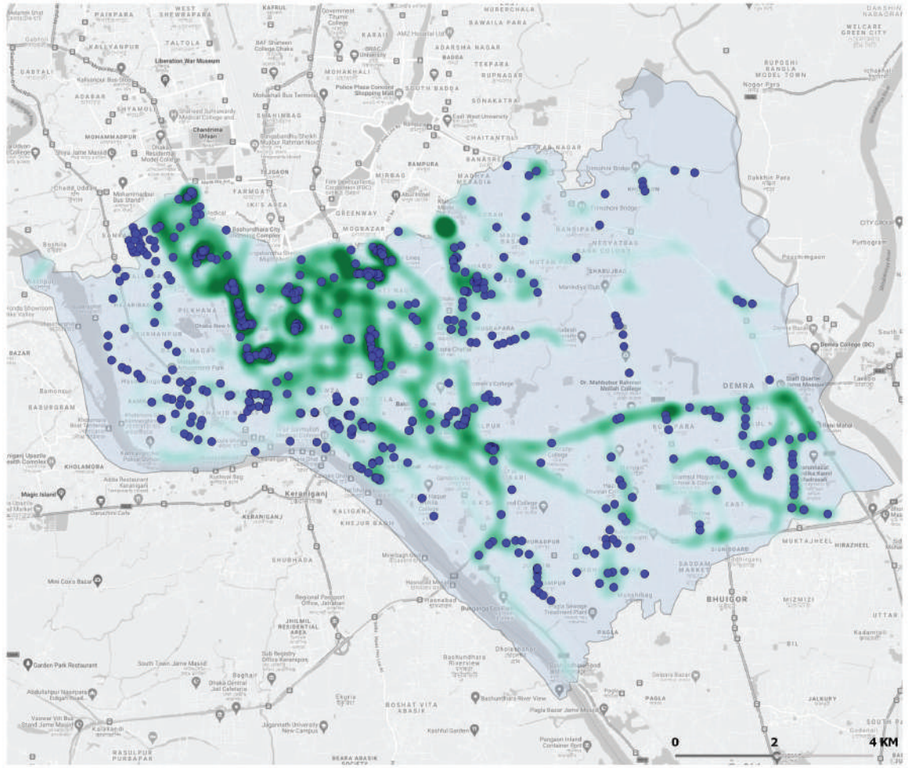
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and walkpath



Dhaka South City Corporation:
Heat map showing Walkpath and Gender Usage



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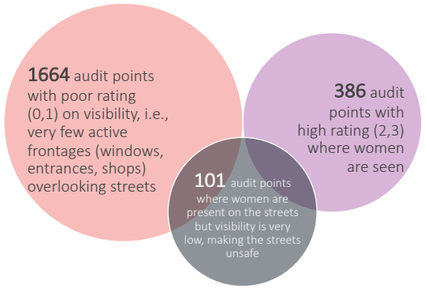
4.3.5 DNCC: CORRELATING GENDER USAGE WITH VISIBILITY

Safetipin overlaid 'presence of gender in public spaces' data on 'visibility' data, generated by Safetipin's visual mapping analysis. This is done to geographically locate the areas where women and others are seen using public spaces which have very low visibility. The heat map below clearly illustrates this correlation. The dark purple areas are where visibility or 'eyes on the street' is good and the light pink areas are where there is no visibility. The blue dots are the audit points showing presence of gender. There are all together 37 audit points identified in DNCC where women can be seen accessing public spaces after dark with no eyes on the streets. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images. Such photographic evidence could be used for further analysis of the area's safety aspects. Active and watched over public places encourage and enable women's participation in city life and enhance women's perception of safety.

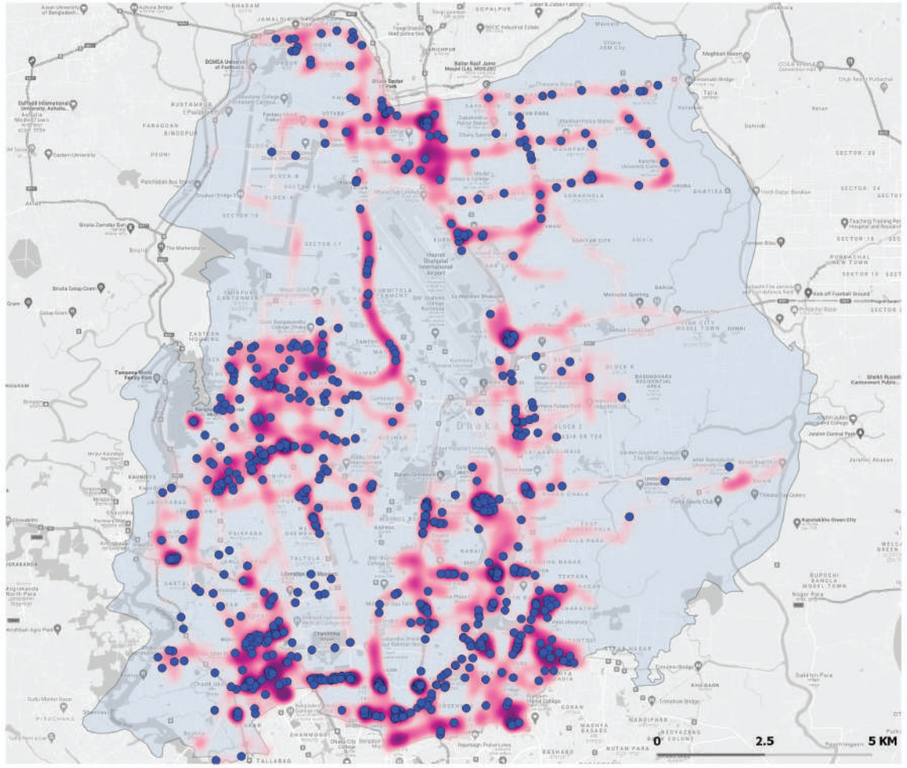
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and visibility



Dhaka North City Corporation:
Heat map showing Visibility and Gender Usage



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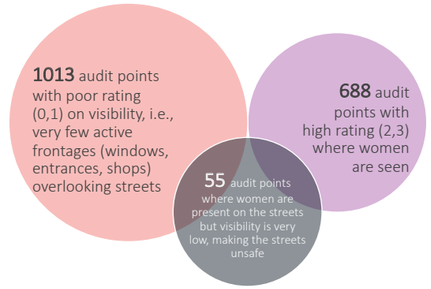
4.3.6 DSCC: CORRELATING GENDER USAGE WITH VISIBILITY

Similarly for DSCC, all together 142 audit points were identified, where women can be seen accessing public spaces after dark with no eyes on the streets. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images.

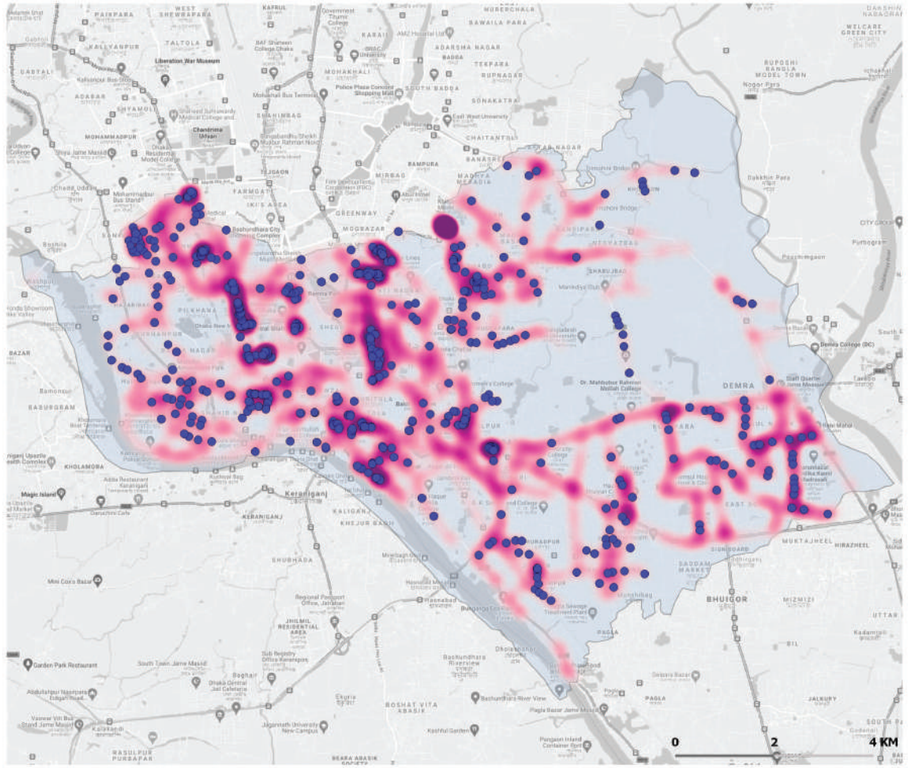
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and visibility



Dhaka South City Corporation:
Heat map showing Visibility and Gender Usage



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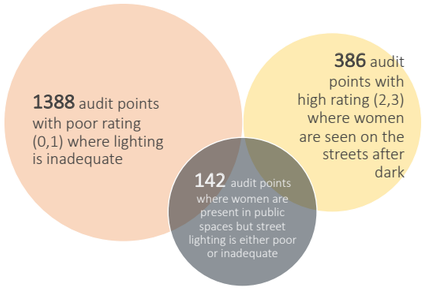
4.3.7 DNCC: CORRELATING GENDER USAGE WITH STREET LIGHTING

Safetipin overlaid 'presence of gender in public spaces' data on 'street lighting' data, generated by Safetipin's visual mapping analysis. This is done to geographically locate the areas where women and others are seen using public spaces which have very low street lighting. The heat map below clearly illustrates this correlation. The dark brown areas are where street lighting is good and the light yellow areas are where street lighting is non-functional or inadequate. The blue dots are the audit points showing presence of gender. There are all together 16 audit points identified in DNCC where women can be seen accessing public spaces in the dark. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images. Such photographic evidence could be used for deeper investigation into the area's street lighting infrastructure and improve safe access to public spaces. Women's access to public spaces would certainly improve if street lighting is prioritise.

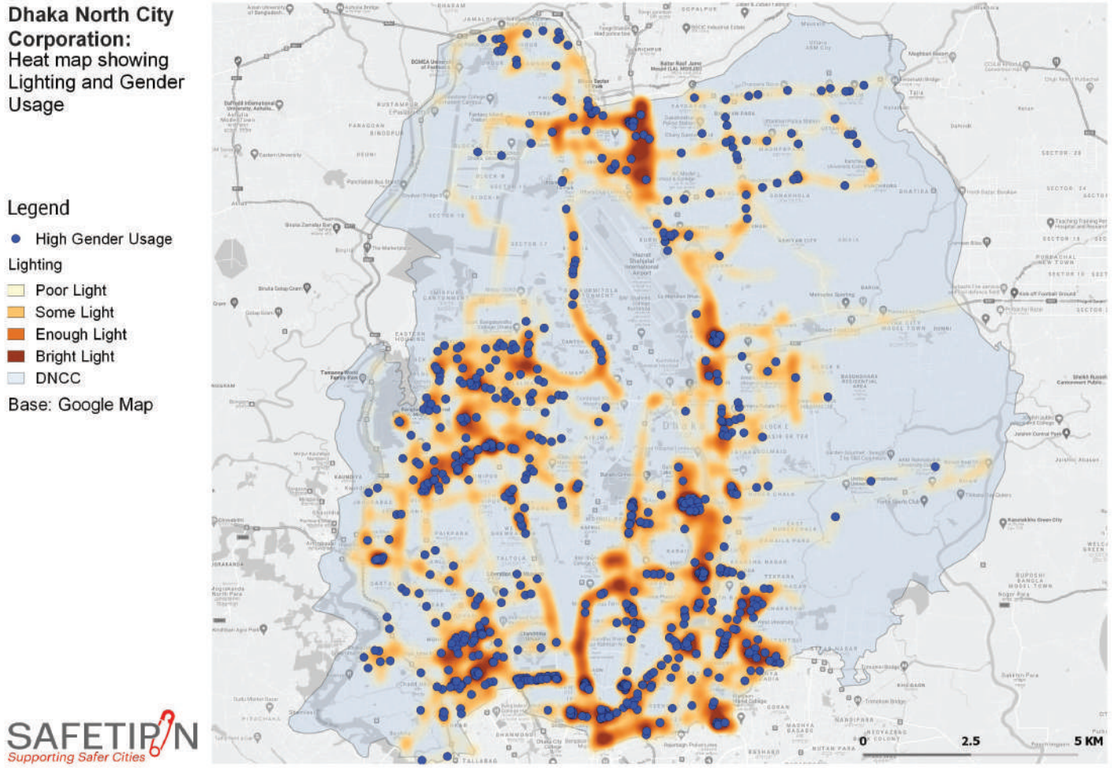
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and street lighting



Dhaka North City Corporation:
Heat map showing Lighting and Gender Usage



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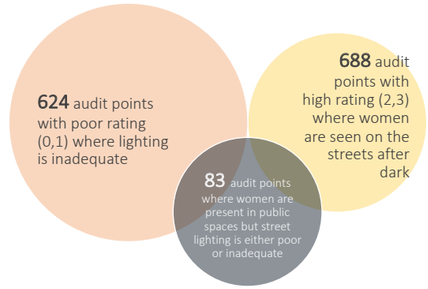
4.3.8 DSCC: CORRELATING GENDER USAGE WITH STREET LIGHTING

Similarly for DSCC, all together 142 audit points were identified, where women can be seen accessing public spaces in the dark. The diagram below represents this data quantitatively. Each geo-tagged audit point is supported by two or more images.

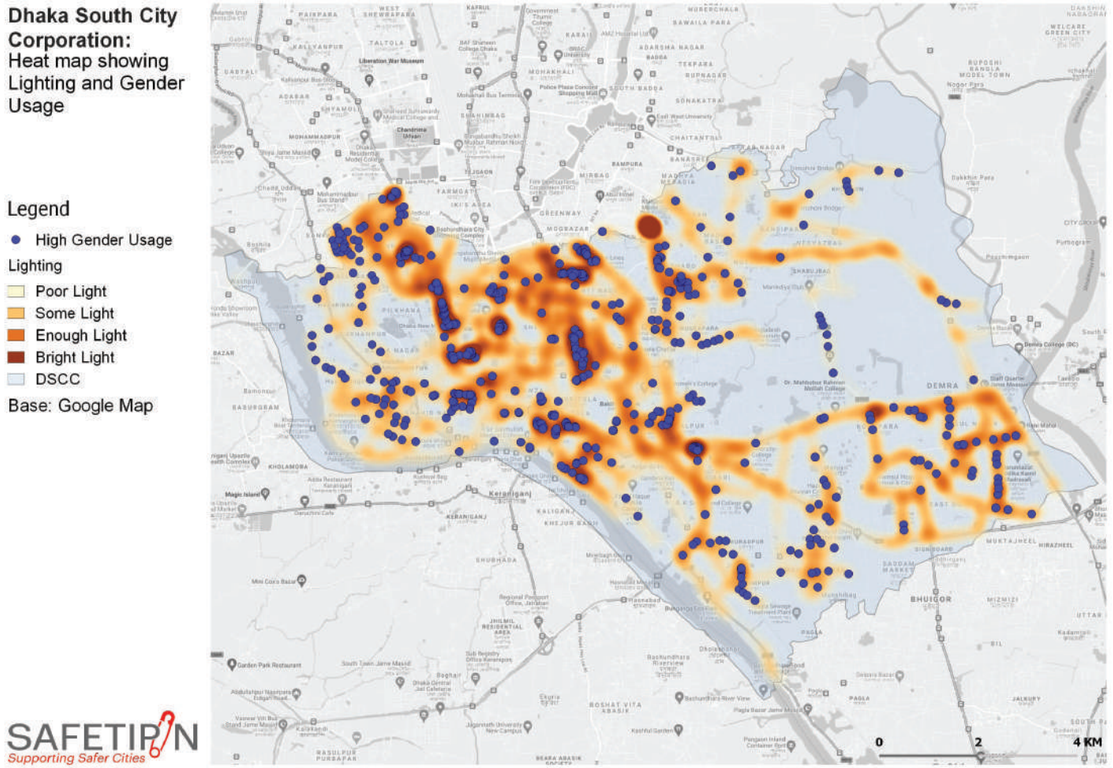
CORRELATION DIAGRAM

Diagram on right

The diagram represents correlation between gender usage and street lighting



Dhaka South City Corporation:
Heat map showing Lighting and Gender Usage



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5. RECOMMENDATIONS

Action points and planned interventions

5.1 KEY ACTION: MAKE PUBLIC SPACES WALKABLE

Walkable cities have places that are easily and safely navigable on foot. Walking has the capacity to promote equality and reduce social exclusion. As a free means of transport, walking can provide access to a range of resources and opportunities. Persons with disabilities (people walking with walking aid), people assisting others (pushing wheelchairs and prams) and people having reduced walking speed (children and elderly) - must have equal access to the walking facility. This implies that people on foot are given consideration first in street design by keeping the city's most vulnerable user in mind. This is the core principle of universal access: every street must be accessible by people of any age and ability.

Being an organically grown, densely built, predominantly mixed-used city, Dhaka has good local level pedestrian connections and a great potential to become a pedestrian priority city. By improving the quality of footpaths, walking environments and linkages to access public transport, it could leverage the existing street network to build a safe, accessible and inclusive city.

As discussed before, the analysed data highlights the state of physical infrastructure and social participation in public space. Hence, in order to make streets and public spaces more safe and accessible, especially for women, parameters such as lighting, footpath, visibility and public transport, need attention. Condition of street lighting, quality of footpath and access to public transport, are the physical infrastructure parameters and visibility, is the social usage parameter which need improvement. Specific maps for each parameter with data points having lower ratings are given below. Collated sheets are also included to look at the information at a glance. Analysed maps are also included with generic recommendations on bus stops, markets, community centres and educational institutions. A detailed recommendation on walkability is given as well which looks at immediate upgradation of the walking environment.

5.2 LEARNING FROM OTHER CITIES

Safetipin's mapping in other cities like Delhi, Gurgaon, and Bogota have yielded positive results in identifying and improving certain parameters for enhancing safety and accessibility in public spaces.

In Delhi in 2014, after the first round of mapping, 7438 darkspots were identified in the city. The authorities made dedicated efforts in making the city well lit at night to improve safety and usage of public space. In 2018, another round of audits were done to map the city's improved condition and to identify more dark spots.

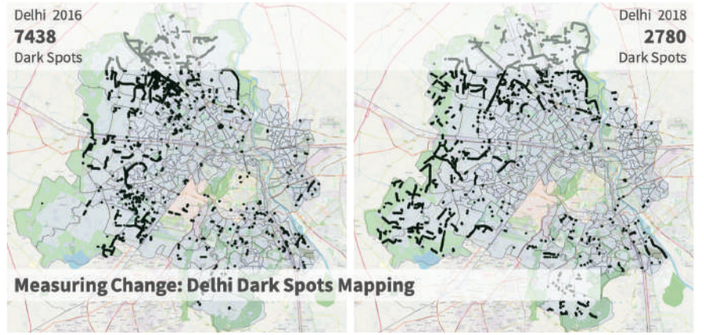
Similarly, in Gurgaon in 2016, mapping was done to improve the quality of street lighting in order to make people feel safer on the streets after dark. The Gurgaon Municipal Corporation had asked to identify places where people were seen at night and where street lighting was inadequate. 630 nos. of such spots were located in the city where street lighting was improved for better visibility and safety at night.

In Bogota, the secretary of women of the city municipality involved biker's community to use Safetipin application to map their cycle tracks in order to encourage more women could use them safely and easily. After the first mapping in 2016 they added cycle stands near bus stops, added CCTV cameras on tracks and improved the track surfaces. In 2019, they re-mapped the cycle tracks to measure the impact and added more cycle routes to the mapping.

Analysed data shows,

- *40% of DNCC & 44% of DSCC,* ***has no or poor quality footpath***
- *38% of DNCC & 34% of DSCC,* ***has distant or unavailable formal transport stops/stands within 5-10 mins of walking distance***
- *36% of DNCC & 28% of DSCC,* ***has no or poor visibility***
- *33% of DNCC & 26% of DSCC,* ***has deserted public spaces***

Women and children using public space in the evening (6-9pm)
Only *18% of DNCC & 19% of DSCC,* ***have presence of women & children in streets***



DELHI AUDIT

Image on left

The image shows dark spot mapping of the city of Delhi

GURGAON AUDIT

Image on left

The image shows before and after photos of a stretch of road where lighting was improved

BOGOTA AUDIT

Image on left

The image shows bikers' community in Bogota who mapped the cycle tracks via Safetipin Nite

5.3.1 DNCC: IMPROVE FOOTPATH CONDITION TO ENHANCE WALKABILITY

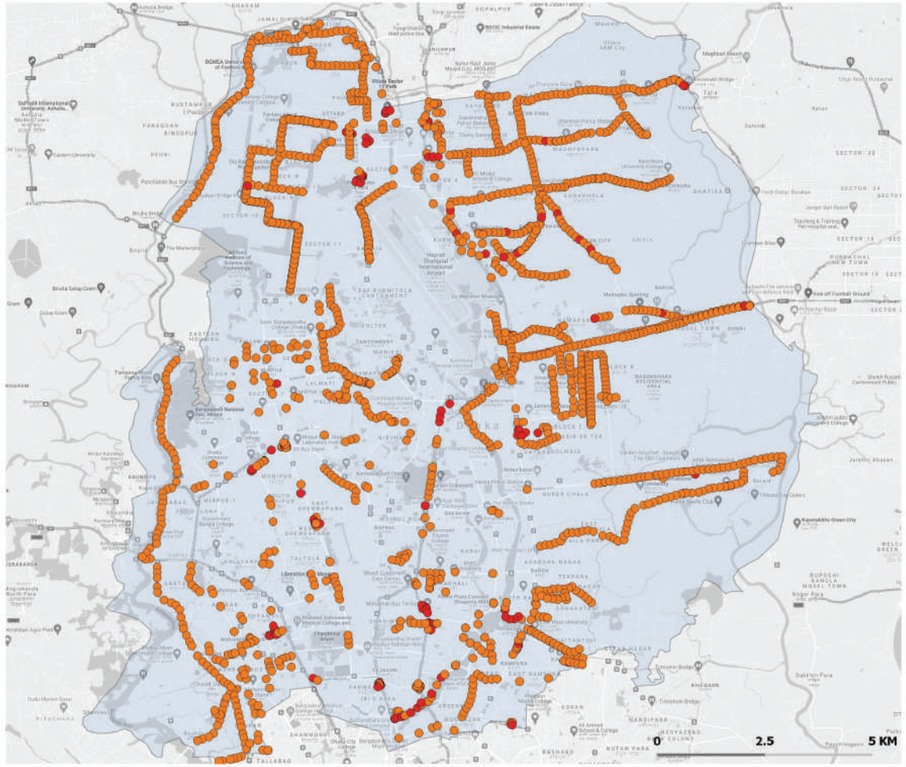
As seen on the walkpath parameter map on page 21 and on the accessibility mapping chapter which includes thorough analysis of the walkpath condition, availability of accessibility elements and types of obstruction present in DNCC - it is noted 40% of the area is either without any footpath or has very poor quality of footpath. Broken, discontinuous and blocked footpath could be easily fixed to achieve ease of walking in the area which is important for pedestrians, especially women to feel safe while accessing the area for various daily activities. Safetipin's data (GIS map with geo-located images) can be used to improve pedestrian access in both the corporations of Dhaka. The map below represents the locations where there are no dedicated walkpaths, no constructed footpaths and footpaths with obstructions.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show very narrow footpath.

Dhaka North City Corporation: Poor Walkpath



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5.3.2 DSCC: IMPROVE FOOTPATH CONDITION TO ENHANCE WALKABILITY

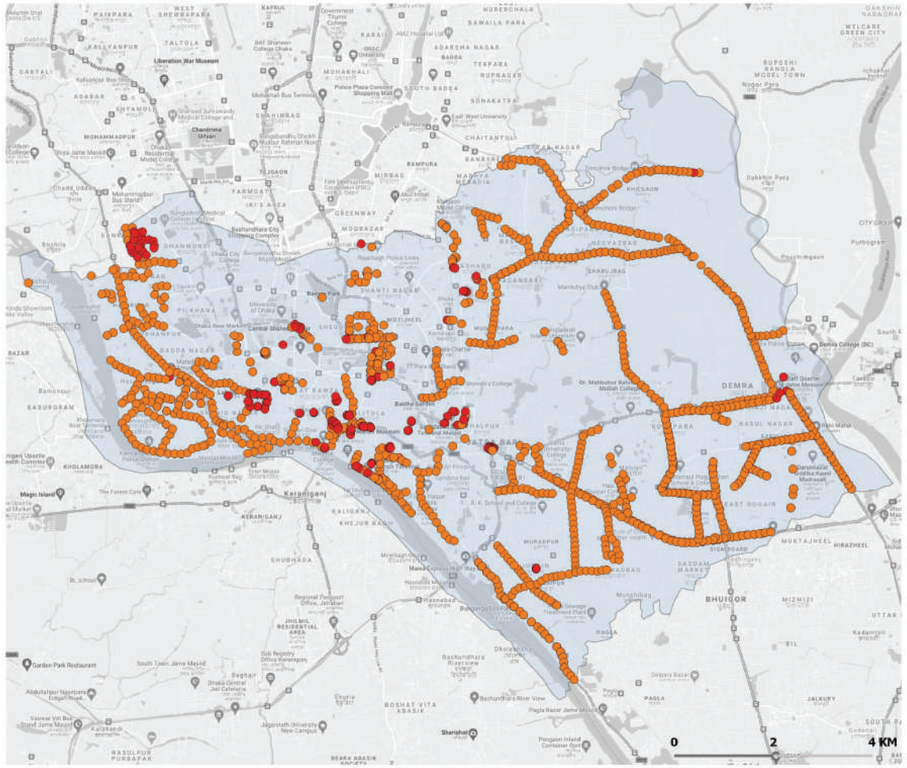
Similarly for DSCC, it is seen on the walkpath parameter map on page 31 and from the analysis given on the accessibility mapping chapter, that 44% of the area is either without any footpath or has very poor quality of footpath. The map below represents the locations where there are no dedicated walkpaths, no constructed footpaths and footpaths with obstructions. This GIS map with supporting geo-located images as evidence, could be used for footpath up-gradation program such as, construction of dedicated footpaths, repair of existing footpaths and removal of obstructions from built footpaths. More detailed recommendations on footpath follows at the end of this chapter.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show very narrow footpath.

Dhaka South City Corporation: Poor Walkpath



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5.3.3 DNCC: MAKE STREETS VISIBLE, ADD MORE 'EYES ON THE STREETS' TO MAKE THEM SAFER

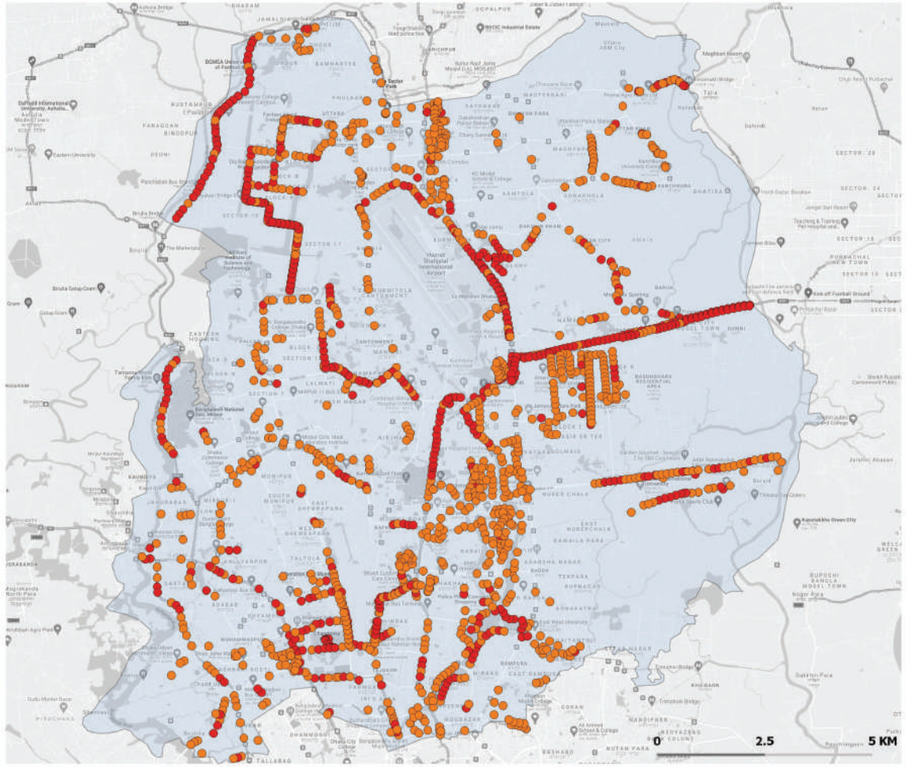
As analysed on the visibility parameter map on page 23, 36% of DNCC has either not any or poor visibility which means people present on the streets cannot be seen by other people living by or working on the streets - the concept of 'eyes on the streets'. Studies show perception of safety improves among women and others, when public places are active, used by diverse groups of people and are visible from adjacent buildings. Safetipin's data (GIS map with geo-located images) can be used to improve 'eyes on the streets' - the key component in making cities safe, accessible and therefore inclusive. The map below represents the locations where visibility is low. This information could be used for enhancement of visibility in DNCC.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show good visibility.

Dhaka North City Corporation: Poor Visibility



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5.3.4 DSCC: MAKE STREETS VISIBLE, ADD MORE 'EYES ON THE STREETS' TO MAKE THEM SAFER

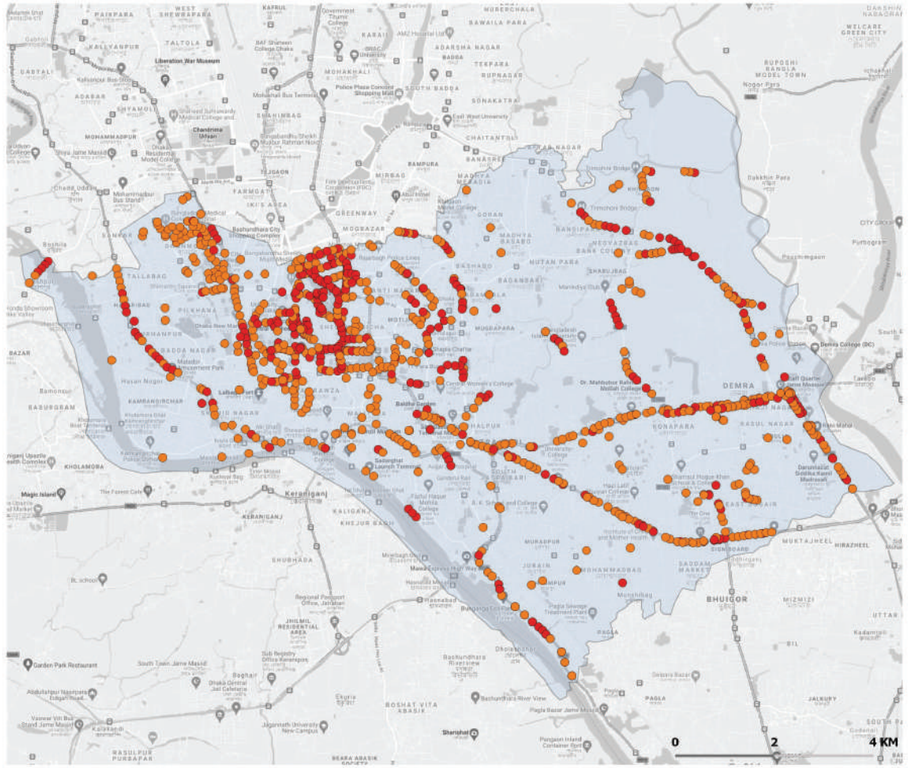
Similarly for DSCC, it is seen on the visibility parameter map on page 33 that 28% of the area has either not any or poor visibility. The map below represents the locations where visibility is low. This information could be used for enhancement of visibility by a range of strategies such as by replacing opaque, high, boundary walls with fences which restricts access but retains inside-outside visual connection, adding lights to transport stops, foot-overs bridges, underpasses, and organising vendors and on-street parking. If public spaces are active it positively impacts women's perception of safety in the city. Few strategies to improve visibility in public places are given at the end of this chapter.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show good visibility.

Dhaka South City Corporation: Poor Visibility



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5.3.5 DNCC: MAKE PUBLIC TRANSPORT ACCESSIBLE TO ENHANCE REACH TO OPPORTUNITIES

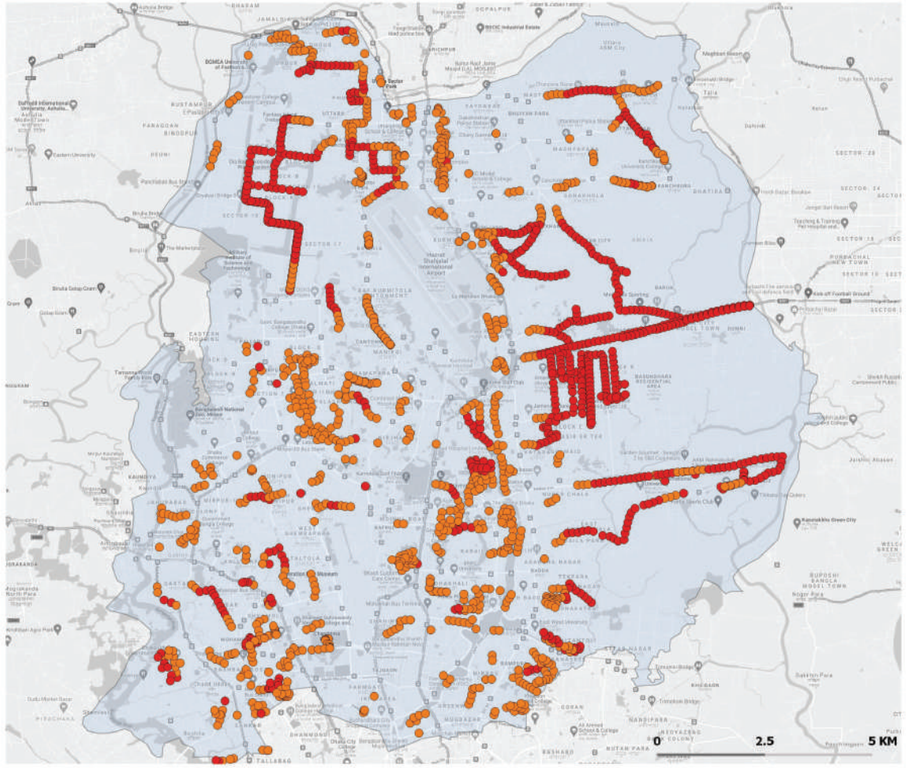
As shown on the public transport parameter map on page 22, 38% of DNCC has either distant (beyond 10 mins walking distance) or no public transport stops/stands available. Adding more public transport stops/stands will improve access for all. Safe and reliable public transport is the critical link between women's access to education, employment and resources in the city. Safetipin's data (geo-located images) can be used to improve access to public transport in both the corporations. The map below represents the locations where there are either no public transport stops available or the stops are distant (beyond 10 mins walking distance).

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show public transport stands.

Dhaka North City Corporation: Poor Public Transport



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5.3.6 DSCC: MAKE PUBLIC TRANSPORT ACCESSIBLE TO ENHANCE REACH TO OPPORTUNITIES

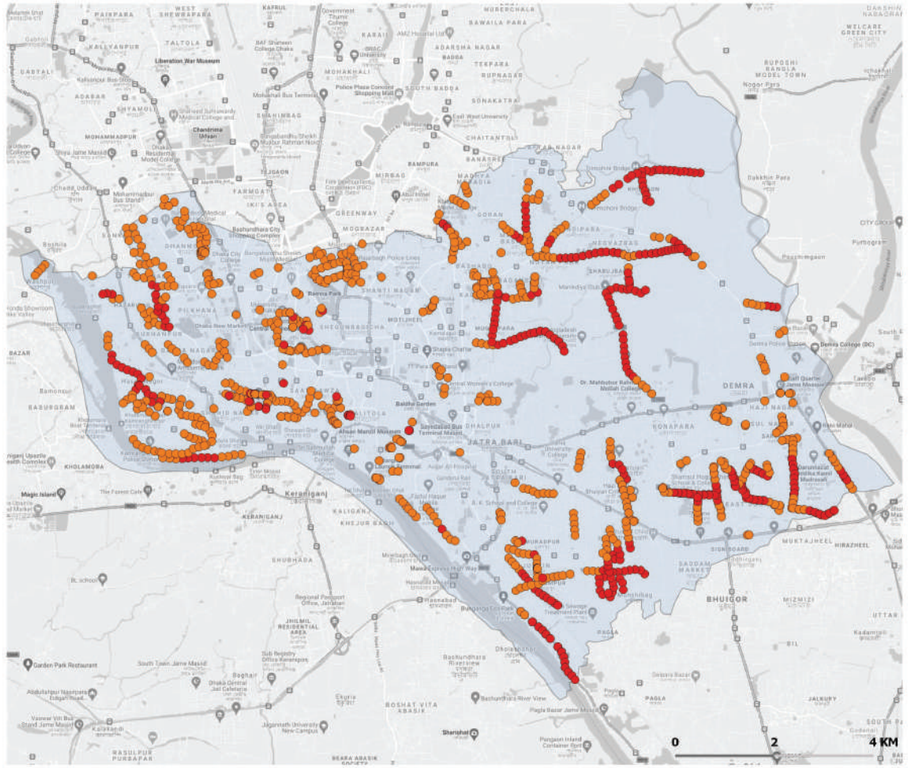
Similarly for DSCC, it is seen on the public transport parameter map on page 32 that 34% of the area has either distant (beyond 10 mins walking distance) or no public transport stops/stands available. The map below represents the locations where there are either no public transport stops available or the stops are distant. Such information could be used for planning transport linkages such as, adding more bus stops, formal auto/rickshaw stands within 2-5 minutes walking distance on the identified locations. The parking data (page 46 & 47) for DNCC and DSCC shows, good availability of NMT, mainly cycle rickshaws as a public transport option. But acute inadequacy of formal rickshaw stands to park and organise them for better access and reach.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show public transport stands.

Dhaka South City Corporation: Public Transport



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5.3.7 DNCC: MAKE STREET LIGHTING FULLY FUNCTIONAL TO IMPROVE SAFETY AND ACCESS

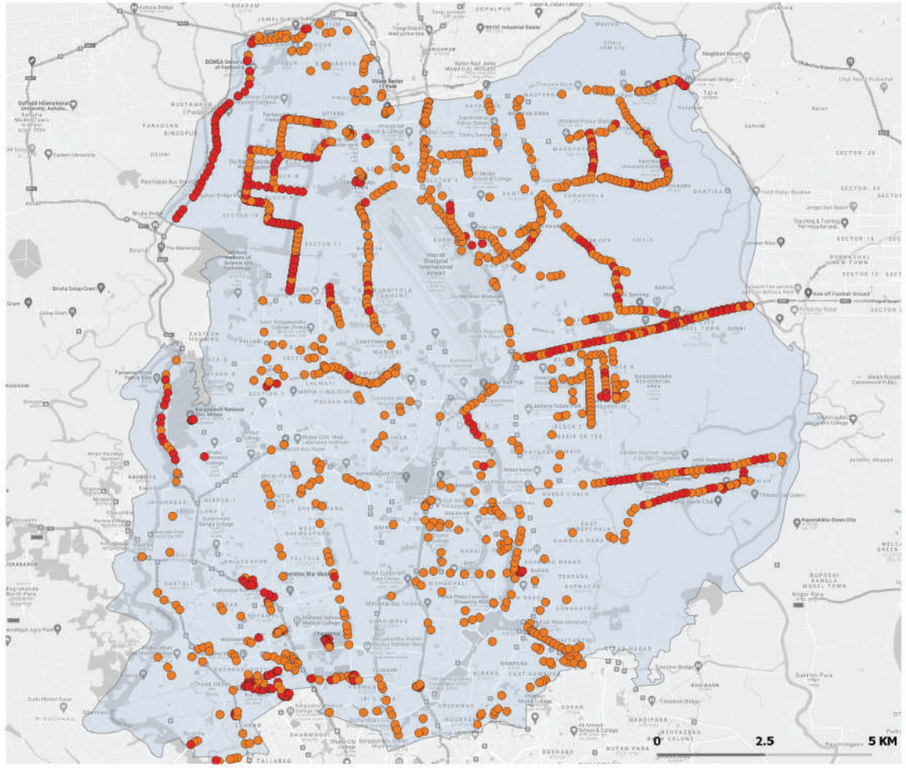
As seen on the lighting parameter map on page 20, only 09% of DNCC, has no street lighting and 20% has inadequate (low light affecting visibility) street lighting. This could be fixed immediately to achieve 100% adequate street lighting. Street lighting is crucial for ensuring safe access to and within public spaces and plays a vital role in people's, particularly women's perception of safety in streets and public places after dark. Safetipin's data (geo-located images) can be used to improve street lighting in the city. The map below represents the locations where there are either absolutely no lights, inadequate lights or non-functional street lights.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show low street lighting.

Dhaka North City Corporation: Poor Lighting



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5.3.8 DSCC: MAKE STREET LIGHTING FULLY FUNCTIONAL TO IMPROVE SAFETY AND ACCESS

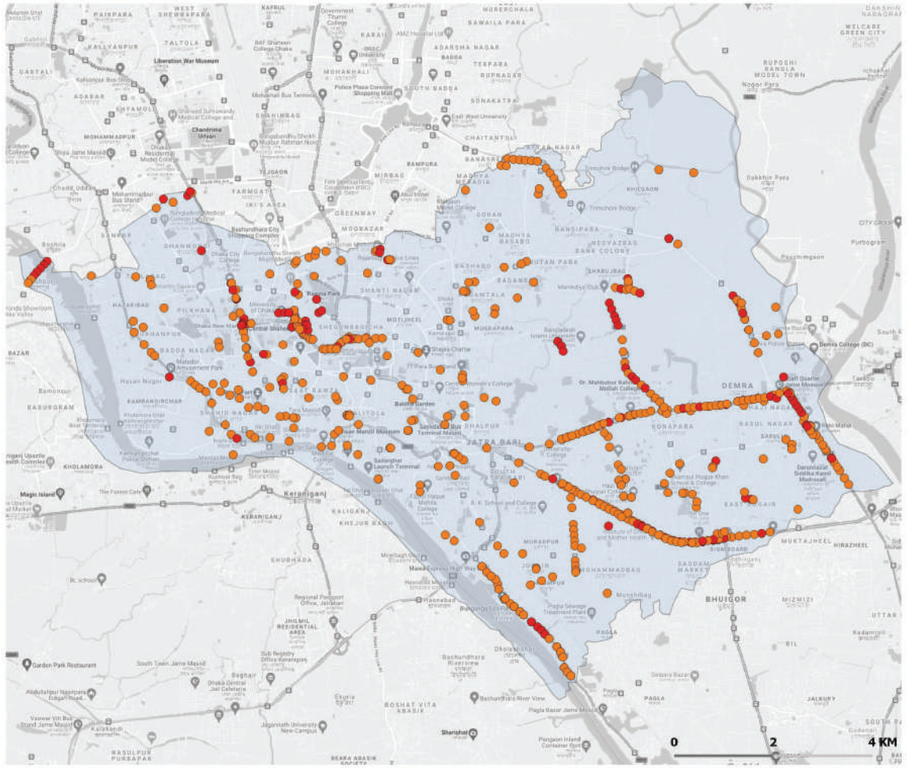
Similarly for DSCC, it is seen on the lighting parameter map on page 30 that only 03% of the area has no street lighting and 14% has inadequate (low light affecting visibility) street lighting. This could be fixed immediately to achieve 100% adequate street lighting. The map below represents the locations where there are either absolutely no lights, inadequate lights or non-functional street lights. This information could be used for the ease of planning for immediate up-gradation such as, adding more street lights and fixing non-functional street lights in order to improve women's perception of safety and actual, physical access to public spaces.

GEO-LOCATED IMAGES

Left to right

The geo-tagged photos show low street lighting.

Dhaka South City Corporation: Poor Lighting



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5.3.9 DNCC & DSCC: ACTIONABLE PARAMETERS WITH 0,1 RATINGS AT A GLANCE

The table below has collated data on number of audit points with ratings of 0 and 1 for the actionable parameters - Lighting, Walkpath, Visbility and Public Transport. For example, it says at how many points in DNCC, walkpath is not available at all - 155 points and is in poor condition - 1628 points. As mentioned, each point is supported by images and such information is available as a GIS layer for further action.

A table of public places which were audited with My Safetipin application is also included which consolidates audit points with poor safety ratings (0 & 1) only for actionable parameters.

	Parameter	Safety Rating 0		Safety Rating 1	
DNCC	LIGHTING	**None:** No street lights or light from any other sources	**403 points**	**Little:** Can see lights but there is low visibility in the area	**985 points**
	WALKPATH	**None:** No path for walking available	**155 points**	**Poor:** Footpath exists but in very bad condition	**1628 points**
	VISIBILITY	**No eye**s: No windows, balconies and entrances of shops and/or residences over look this point	**574 points**	**Few Eyes:**Less than 5 windows, balconies or entrances over looking this point	**1090 points**
	PUBLIC TRANSPORT	**Unavailable:** No metro station, bus stop or auto/rickshaw stand available within 10 minutes of walking distance	**768 points**	**Distant:** Bus stop or auto/rickshaw stand avialable within 5 to 10 minutes of walking distance	**1019 points**

	Parameter	Safety Rating 0		Safety Rating 1	
DSCC	LIGHTING	**None:** No street lights or light from any other sources	**127 points**	**Little:** Can see lights but there is low visibility in the area	**497 points**
	WALKPATH	**None:** No path for walking available	**232 points**	**Poor:** Footpath exists but in very bad condition	**1376 points**
	VISIBILITY	**No eye**s: No windows, balconies and entrances of shops and/or residences overlook the area	**374 points**	**Few Eyes:**Less than 5 windows, balconies or entrances over looking this point	**639 points**
	PUBLIC TRANSPORT	**Unavailable:** No metro station, bus stop or auto/rickshaw stand available within 10 minutes of walking distance	**448 points**	**Distant:** Bus stop or auto/rickshaw stand avialable within 5 to 10 minutes of walking distance	**808 points**

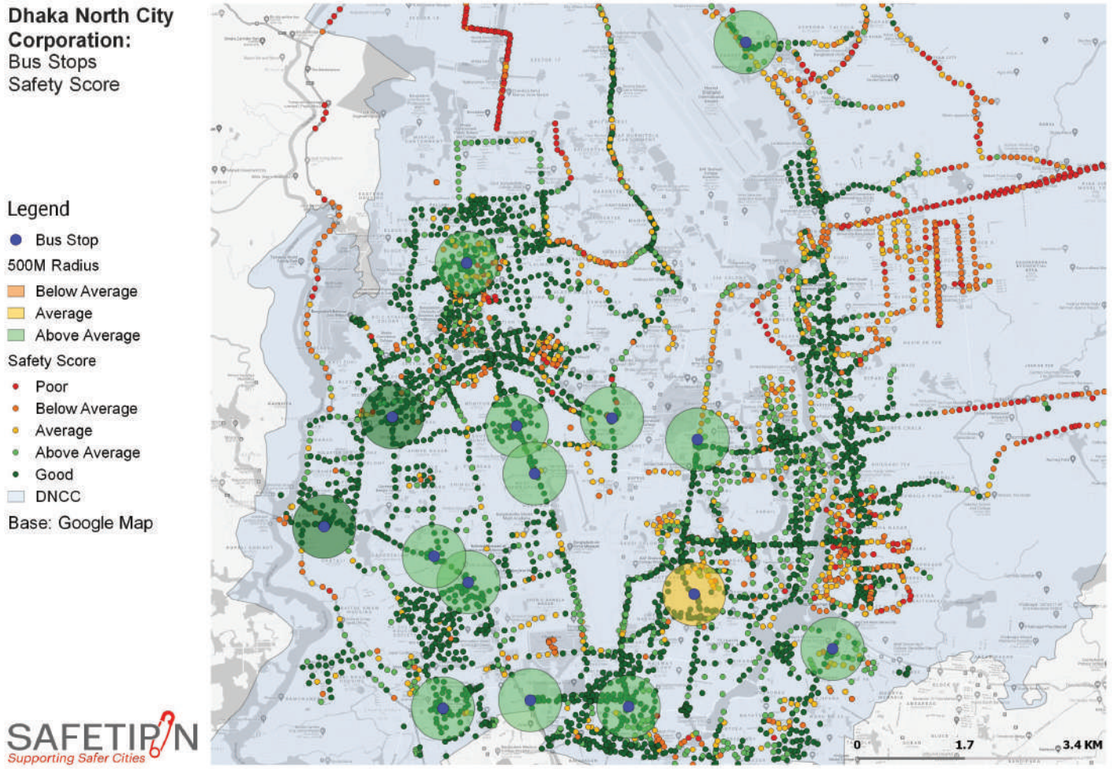
My Safetipin Audit Locations	Parameters with Safety Ratings of 0 & 1						Safety Score
	Walkpath	Visibility	Public Transport	Lighting	People	Gender Usage	
Community Centres							
New 1 Lalkuthi Community Center	35	2	10	2	0	32	**4.3**
New 10 Mohanogor Natto Moncho	36	18	0	3	9	52	**4.2**
New 2 Majed Sarder Community Center	47	0	37	8	3	18	**3.6**
New 3 Moulovi Bazar Community Center	32	7	30	4	6	23	**3.8**
New 4 Abdur Rahim Community Center	21	19	21	6	12	41	**4.0**
New 5 Nolgola Community Center	26	8	8	3	8	17	**3.7**
New 6 Haji Jummon Community Centre	78	8	32	11	12	35	**3.8**
New 7 Golam Morshed Community Centre	21	24	14	7	26	54	**3.9**
New 8 Lalbagh Community Center (Amligola)	24	5	23	9	5	21	**3.4**
New 9 New Community Center (Khilgaon Block C)	21	17	26	4	12	70	**4.2**
Repair 11 Rokonpur	26	10	14	2	9	53	**4.1**
Repair 12 Bongshal Community Center	43	10	3	4	8	37	**4.1**
Repair 13 Fakir Chand Sardar Community Center	23	18	23	6	13	41	**3.9**
Repair 14 Bashabo Community Center	11	8	13	1	7	33	**4.3**
Bus Stops							
Azimpur Bus Stand Masjid	15	25	2	9	20	46	**4.3**
Demra Bus stand	21	28	6	18	26	44	**3.1**
Dhanmondi 27 Bus Stand	2	12	0	10	14	33	**4.4**
Farmgate Bus Stand	10	10	1	5	2	28	**4.4**
Gabtoli Bus Stand	4	9	3	1	1	22	**4.5**
Jatrabari Bus Stop	16	11	0	1	13	34	**4.2**
Kakoli Bus stand	5	8	3	6	3	18	**4.2**
Kallyanpur Bus Stop	2	10	4	8	8	20	**4.3**
Kamalapur Railway Station Platform	8	15	6	4	7	32	**4.1**
Kazipara Bus Stop	2	9	7	7	2	24	**4.2**
Malibagh Mor Bus Stop	4	9	1	11	9	40	**4.6**
Mirpur 1 Bus Stop	3	8	6	0	3	36	**4.4**
Mirpur 14 Bus Stand	7	9	1	3	2	18	**4.3**
Mohakhali Bus terminal	23	9	6	1	9	26	**4.2**
Mohammadpur Bus Stand	12	10	14	25	14	39	**4.4**
Pallabi bus stand	7	10	9	8	9	42	**4.2**
Rampura Bus Stop	15	12	2	6	5	29	**4.3**
Sayedabad Bus Terminal	19	10	0	4	9	35	**4.2**
Shamoly Bus stand	1	11	6	7	7	23	**4.4**
ShewraPara Bus Stand	7	9	3	2	6	14	**4.1**
Markets							
Mirpur 2 Shopping complex	9	10	9	1	5	41	**4.3**
Krishi market	12	5	26	5	14	47	**4.5**
Mohammadpur Town Hall Market	11	15	19	30	32	76	**3.9**
Kawran Bazar	12	14	3	7	7	41	**4.4**
Bashundhara City Shopping Complex	8	10	4	7	8	46	**4.3**
Rayer Bazar Boddobhumi	17	12	9	10	11	23	**4.4**
Bangla Bazar	46	4	10	3	2	45	**4.2**
Naya Bazar	63	5	35	12	10	35	**3.7**
Tanti Bazar	63	9	12	11	8	42	**4.5**
New Market	3	17	1	16	20	38	**4.4**
Shopping Markets (opposite of Dhaka College)	1	17	2	15	18	58	**4.3**
Nilkhet Market	3	21	4	13	19	42	**3.5**
Palashi Bazar	11	36	7	8	21	49	**4.5**
Chawk Bazar	17	10	23	6	6	28	**4.0**
Educational Institutions							
Bangla Academy	16	51	31	23	36	56	**3.8**
Dhaka University	15	64	39	25	42	73	**3.8**
TSC	15	59	39	28	41	69	**3.6**

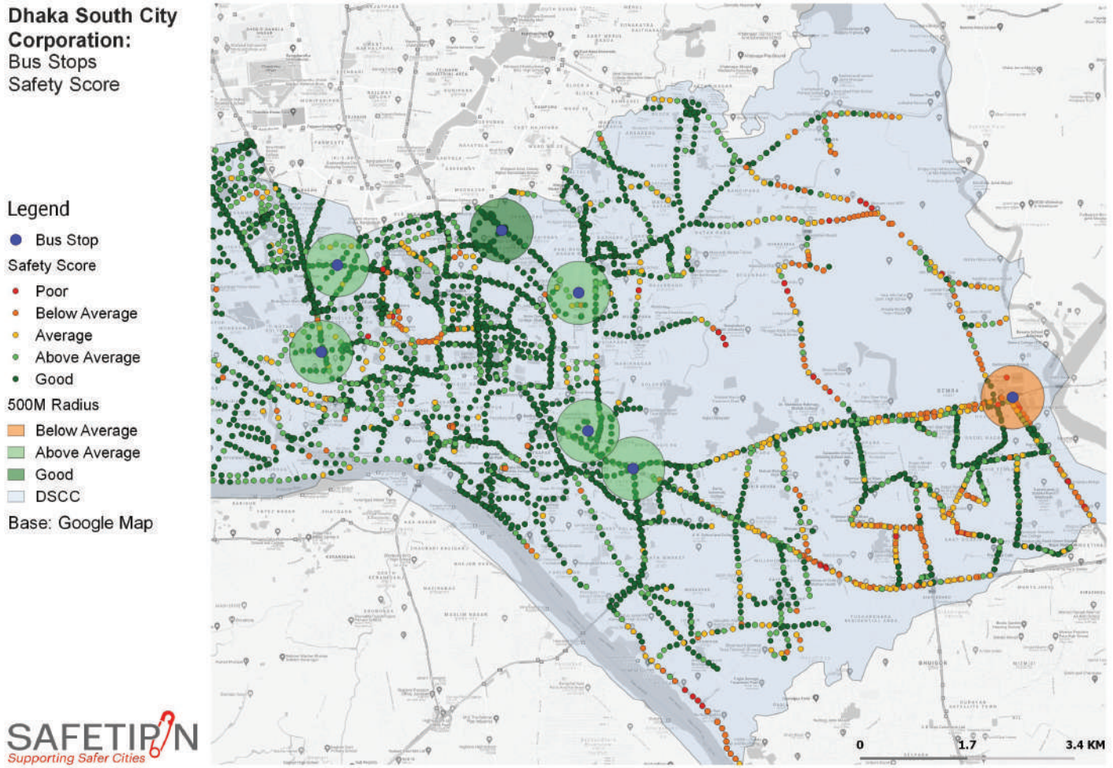
5.3.10 DNCC & DSCC: IMPROVE SAFETY AND ACCESS AT BUS STOPS TO ENHANCE USAGE

Data generated by Safetipin's visual mapping was segregated for bus stop locations. The maps below show 15 bus stop locations in DNCC and 7 bus stops in DSCC with their safety ratings. One bus stop was found to be average in DNCC and another below average in DSCC, mainly due to non availability of walkpath and very poor visibility conditions. During the time of mapping the locations were found to be deserted or had very few people present in them. No women were seen at these locations either during the mapping. A set of guidelines are given below for better access and safety for these bus stops.

1. Dedicated, unobstructed, paved pedestrian walkpaths must be provided to give people easy and safe access to bus stops (see Walkpath recommendations below).
2. Universal accessibility standards must be met for bus stops to allow people with disability better access to and from the bus stops and while boarding/unboarding the bus.
3. Pedestrian crossings must be appropriately placed near bus stops for safe and easy access to/from stops.
4. Bus stops must be avoided at intersections and should be placed at least 30 meters away from them.
5. Bus stops must have areas allocated near them for first/last mile connectivity transport options. They also must provide cycle stands as a park and ride facility.
6. Whenever possible, bus stops should be located in an area where there is enough visibility either from adjacent buildings and/or from people using that area. Having better visibility enhances the perception of safety among women and other users.

The maps of DNCC and DSCC show the safety audit points within 500 metre radius of every bus stop audited by My Safetipin application.



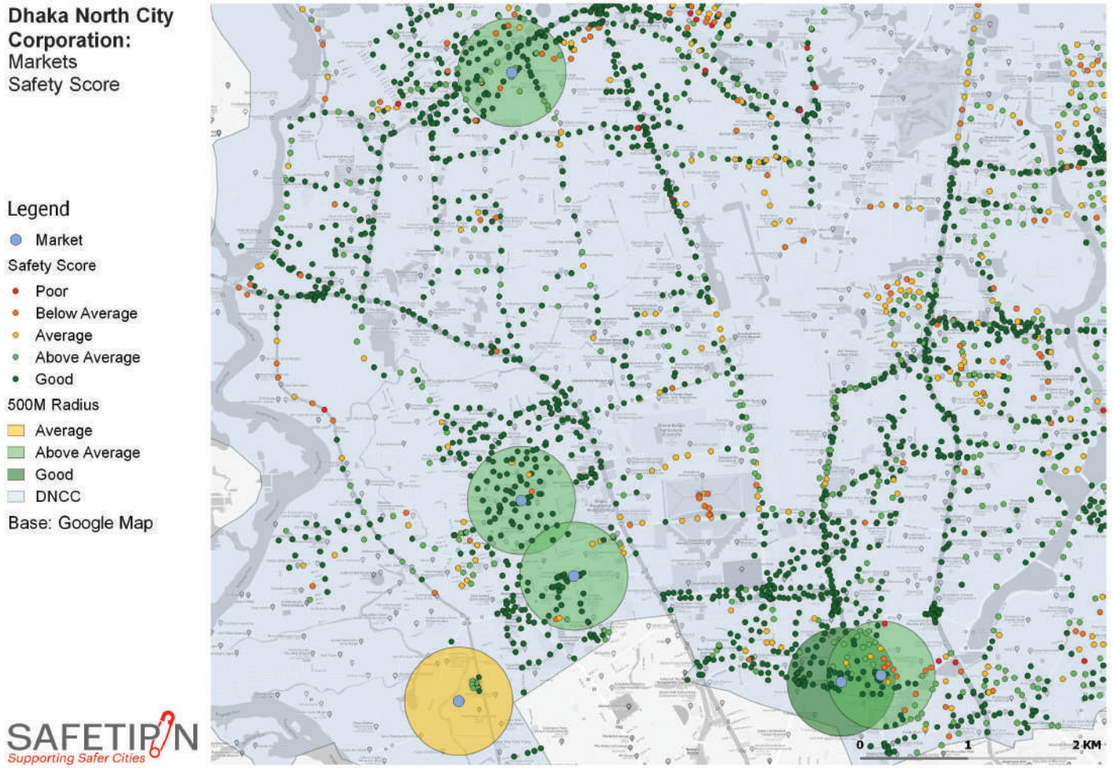


5.3.11 DNCC & DSCC: MAKE LOCAL MARKETS PEDESTRIAN FRIENDLY

Data generated by Safetipin's visual mapping was segregated for markets. Among 14 local markets being audited by both applications, in both the corporations, 5 markets were found to have lower safety ratings on Walkpath, Visibility and Public Transport. The maps below show these market locations in both DNCC & DSCC with their safety rating points within 500m radius. The ratings on the mentioned parameters were poor, below average and average at various audit points mainly due to poor walkpath quality, poor visibility conditions and public transport stands/stops being distant. During the time of mapping the locations were found to have very few women and children present in them. Mostly men were seen at these locations during the mapping. A set of guidelines are given below for better access and safety for these markets.

1. Dedicated, unobstructed, paved pedestrian walkpaths must be provided to give people easy and safe walking environment within and around local markets (see Walkpath recommendations below).
2. Universal accessibility standards must be met for walkpaths to allow people with disability better access within and around local markets (see Walkpath recommendations below).
3. Market places should have a parking strategy in place to organise and manage motorised and non-motorised traffic. Currently, cycle rickshaws are parked everywhere, blocking access to footpaths and causing traffic congestion.
4. Markets should have amenities such as public toilets, police assistance booths and resting areas.
5. Public transport stops must be with 2-5 mins reach and must have areas allocated near them for first/last mile connectivity transport options.
6. Areas around markets must have good visibility either from adjacent buildings and/or from people using that area. Having better visibility enhances the perception of safety among women and others.

Dhaka North City Corporation:
Markets
Safety Score



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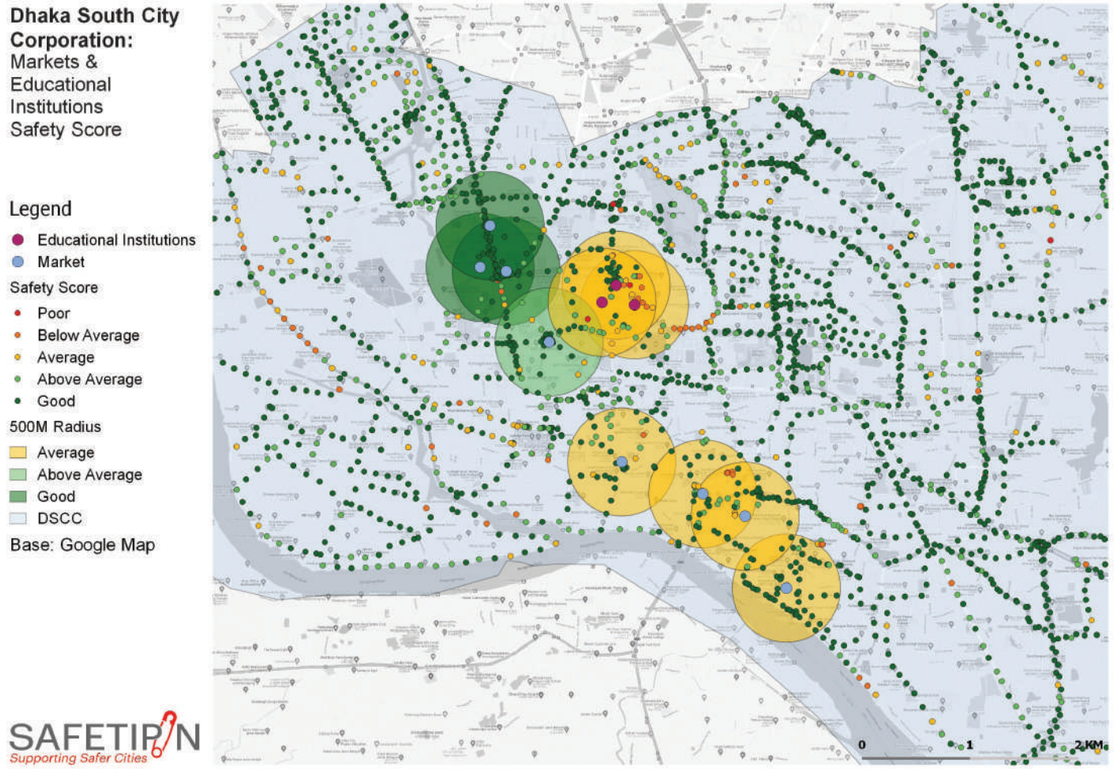
5.3.12 DNCC & DSCC: IMPROVE SAFETY AND ACCESS AROUND EDUCATIONAL INSTITUTIONS

Data generated by Safetipin's visual mapping was segregated for three educational institutions. All three were found to have lower safety ratings on Walkpath, Visibility and Public Transport. The map below shows the educational institutions with their safety rating points within 500m radius. The ratings on the mentioned parameters were poor, below average and average at various audit points mainly due to poor walkpath quality, poor visibility conditions and public transport stands/stops being distant. A set of guidelines are given below for better access and safety for these educational institutions.

1. Dedicated, unobstructed, paved pedestrian walkpaths must be provided to give people easy and safe walking environment within and around local markets (see Walkpath recommendations below).
2. Universal accessibility standards must be met for walkpaths to allow people with disability better access within and around local markets (see Walkpath recommendations below).
3. Public transport stops must be with 2-5 mins reach and must have areas allocated near them for first/last mile connectivity transport options. They also must provide cycle stands as a park and ride facility as a inexpensive and sustainable mode of transport for young people.
4. Areas around institutions must have good visibility either from adjacent buildings and/or from people using that area. Having better visibility enhances the perception of safety among women and other users. Reducing boundary wall heights, front setbacks of plots and encouraging 'active frontage' for better visual connection between the built edge and the pedestrian on the street are some useful strategies to incorporate in order to enhance safety (see Visibility recommendations).

The map below show the safety audit points within 500 metre radius of all the markets and institutions which were audited by My Safetipin app.

Dhaka South City Corporation:
Markets & Educational Institutions
Safety Score



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5.3.13 IMPROVE SAFETY AND ACCESS IN WARDS WITH LOWER SAFETY SCORES

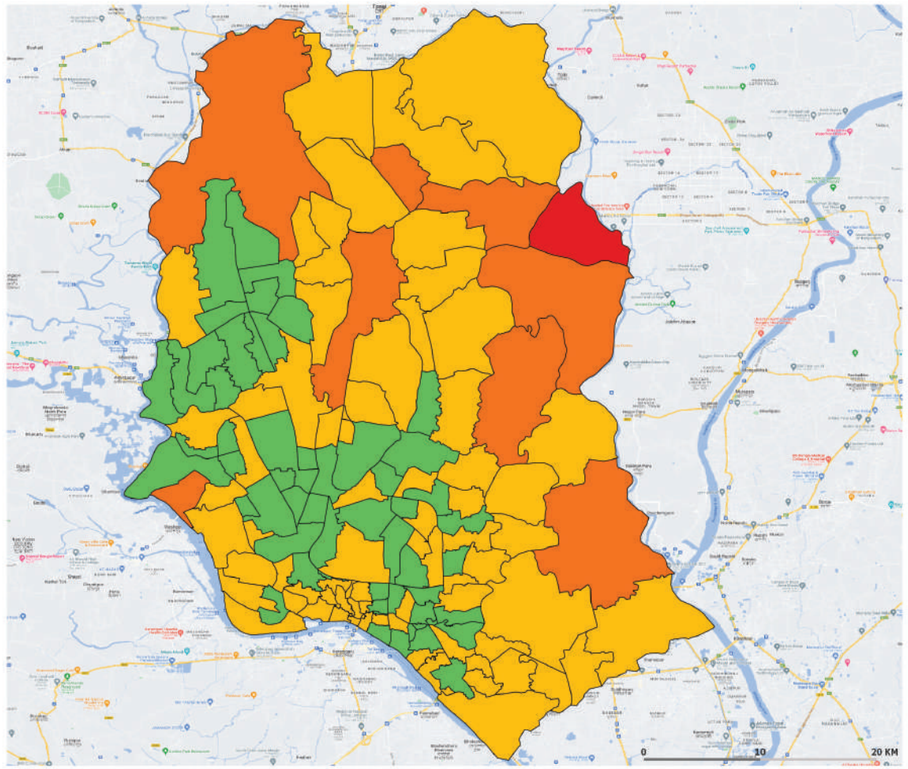
Lighting, Walkpath, Public Transport and Visibility are the parameters which address some of the key issues of safety and accessibility. Conditions of Walkpath and Public Transport directly affects accessibility and mobility in the city, especially for women. Whereas, Lighting and Visibility affects actual safety as well as perception of safety on the streets by the availability of street lighting after dark and by the presence of 'eyes on the streets.' These parameters along with Gender Diversity have the strongest correlation with the overall safety score. If physical infrastructure parameters - Lighting, Walkpath, Public Transport and Visibility could be improved with strategic interventions at neighbourhood and city level - collectively these will have a positive impact on Gender Diversity which is a parameter which measures social usage of space. Improving these parameters will impact safety and accessibility in the wards of Dhaka (red, orange and yellow as seen on the map below) which have scored 'average' or below on safety rating.

A set of recommendations on the actionable parameter are given below for these wards to improve their overall Safety Score.

A list of safety scores ward-wise along with parameter ratings of lighting, walkpath, Visibility and Public Transport is included here for ready reference.

The map below show the safety audit points within 500 metre radius of all the markets and institutions which were audited by My Safetipin app.

Dhaka:
Ward wise Safety Score



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Ward Number/Name	Safety Score	Colour Code	Lighting	Walkpath	Visibility	Public Tansport
Dumni	1.3		0.4	1.0	0.1	0.0
Satarkul	2.7		0.7	1.0	1.1	0.7
Beraid	3.0		0.9	1.4	1.3	0.1
Harirampur (part)	3.4		1.0	1.1	1.2	1.0
Ward No-46 (part)	3.6		1.6	1.5	1.5	2.0
Dakshinkhan (part)	3.6		1.3	1.2	1.9	1.1
Demra (part)	3.9		1.7	1.2	1.3	1.6
Nasirabad	4.1		2.2	1.4	1.7	0.0
Shyampur	4.2		1.6	1.2	2.0	0.8
Bhatara	4.3		1.5	1.5	1.9	0.7
Uttar Khan	4.5		1.1	1.2	1.9	1.7
Matuail (part)	4.6		1.6	1.4	2.0	1.9
Ward No-17 (part)	4.6		1.9	1.5	1.5	1.3
Ward No-61	4.7		1.9	0.6	2.3	0.9
Dakshingaon (part)	4.8		2.1	1.1	2.3	1.1
Ward No-98 (rest area)	4.8		1.8	2.0	0.9	1.9
Ward No-59	4.8		1.7	1.4	1.8	1.7
Ward No-68 (part)	4.8		2.1	0.7	2.1	2.0
Ward No-69	4.9		2.1	0.6	2.1	1.3
Saralia	4.9		1.8	1.5	1.9	1.6
Ward No-72	4.9		2.0	0.7	2.0	2.5
Ward No-66 (Part)	4.9		1.9	0.5	2.0	1.9
Ward No-15 (part)	4.9		1.6	1.9	2.1	1.8
Badda	4.9		1.7	1.5	2.3	1.1
Ward No-58	5.0		1.9	1.2	1.7	2.1
Manda	5.0		2.0	1.9	2.3	0.0
Ward No-89	5.1		2.0	1.1	2.4	1.1
Ward No-82	5.1		2.1	1.2	1.8	1.6
Ward No-65	5.2		1.7	1.3	2.1	2.1
Ward No-83	5.2		2.2	1.7	2.5	1.5
Ward No-77	5.2		1.8	1.0	1.9	1.6
Ward No-28	5.2		1.9	1.8	2.3	1.5
Ward No-60	5.2		1.8	1.1	2.0	1.6
Ward No-48 (part)	5.2		1.9	1.4	2.2	1.4
Dhania (part)	5.3		1.7	1.3	2.2	2.4
Ward No-88	5.4		2.3	2.0	2.0	1.6
Ward No-64	5.4		2.0	1.6	2.2	1.6
Ward No-63 (part)	5.4		1.9	1.7	1.7	2.5
Ward No-01	5.4		2.0	1.9	1.8	1.8
Ward No-16	5.4		2.3	2.2	1.4	2.7
Ward No-47 (part)	5.4		1.9	1.6	2.4	1.8
Sultanganj	5.4		2.0	1.5	2.7	1.5
Ward No-56 (part)	5.5		2.0	2.2	1.3	2.4
Ward No-78	5.5		2.1	1.3	2.5	2.0
Ward No-08	5.5		1.8	1.8	1.9	2.4
Ward No-31	5.6		2.2	2.0	1.6	2.7
Ward No-67 (part)	5.6		2.1	0.9	1.9	1.7
Ward No-33	5.6		2.4	2.2	1.4	2.2
Ward No-45	5.7		1.6	2.2	2.3	1.8
Ward No-30	5.7		1.7	2.1	2.1	2.6
Ward No-38 (part)	5.7		2.2	2.5	1.3	2.5
Ward No-18	5.7		2.1	2.4	1.7	2.1
Ward No-91	5.8		2.4	1.1	2.9	0.8
Ward No-34	5.8		2.1	2.5	1.5	2.4
Ward No-25	5.8		2.1	1.6	2.6	1.9
Ward No-26	5.8		1.8	1.8	2.4	2.0
Ward No-23	5.9		2.0	2.4	2.3	1.6
Ward No-41	5.9		2.3	2.2	1.6	2.1
Ward No-20 (part)	5.9		2.1	2.0	2.3	2.2
Ward No-54	6.0		2.3	2.3	2.1	2.5
Ward No-19	6.0		2.1	2.4	1.9	2.0
Ward No-87	6.0		2.1	2.2	2.2	2.7
Ward No-85	6.0		1.9	2.0	2.3	2.3
Ward No-43	6.0		2.1	1.8	2.3	1.7
Ward No-02	6.0		1.9	2.3	2.4	2.2
Ward No-80 (part)	6.1		2.2	2.7	1.5	3.0
Ward No-71 (part)	6.1		2.2	0.8	2.2	2.6
Ward No-37	6.1		2.3	1.9	1.9	2.6
Ward No-79	6.1		2.3	1.2	2.7	2.2
Ward No-32	6.1		2.2	2.3	1.9	2.8
Ward No-55	6.1		2.2	2.0	2.2	2.1
Ward No-46	6.1		2.0	1.8	2.2	2.0
Ward No-29	6.1		2.1	1.4	2.8	1.4
Ward No-76 (part)	6.1		2.3	1.6	2.0	2.6
Ward No-73	6.1		2.1	1.2	2.4	2.4
Ward No-40 (part)	6.1		1.9	2.6	1.6	2.4
Ward No-13	6.1		2.1	1.8	2.4	1.9
Ward No-81	6.2		2.1	1.4	2.4	2.9
Ward No-11	6.2		2.0	2.2	2.6	1.8
Ward No-53	6.2		2.1	2.5	1.7	2.2
Ward No-92	6.2		2.5	1.3	2.7	1.9
Ward No-22	6.2		2.2	2.0	2.3	2.3
Ward No-49	6.2		2.3	2.6	2.0	2.3
Ward No-24	6.2		2.1	1.6	2.6	1.2
Ward No-10	6.2		2.6	2.2	2.1	2.1
Ward No-74	6.2		2.0	2.4	2.3	2.4
Ward No-75	6.2		2.0	1.8	2.4	2.6
Ward No-86	6.2		2.2	1.8	2.3	2.7
Ward No-09	6.3		2.1	1.8	2.1	2.3
Ward No-27	6.3		2.0	1.6	2.6	2.0
Ward No-21	6.4		1.9	2.1	2.3	2.6
Ward No-90	6.4		2.4	1.9	2.4	2.7
Ward No-05	6.4		2.3	2.0	2.5	2.1
Ward No-84	6.4		2.3	1.6	2.1	2.9
Ward No-04	6.4		2.5	2.6	1.9	2.0
Ward No-42	6.4		2.5	2.2	2.7	1.4
Ward No-06	6.5		2.5	2.2	2.4	2.4
Ward No-57	6.5		2.3	2.6	1.5	2.3
Ward No-70	6.5		2.0	1.4	2.4	2.6
Ward No-50	6.6		2.6	2.6	2.4	2.4
Ward No-36	6.6		2.4	2.0	2.3	2.8
Ward No-62	6.7		2.0	2.3	2.0	2.7
Ward No-03	6.7		2.6	2.7	2.7	1.6
Ward No-07 (part)	6.7		2.4	2.4	2.2	2.6
Ward No-14 (part)	6.8		2.3	1.9	2.6	2.5
Ward No-35	6.9		2.1	2.5	2.4	2.8
Ward No-44	7.0		1.8	2.5	2.7	2.3
Ward No-51 (part)	7.1		2.3	2.4	2.4	2.8
Ward No-39	7.1		2.5	2.1	2.6	2.6
Ward No-12	7.2		2.5	2.5	2.4	2.6
Ward No-52	7.4		2.2	2.5	2.6	2.8

WARD WISE
SAFETY SCORE
List on left

The sheet lists safety rating for all the Dhaka wards along with the key parameter ratings for each ward. See the legend is given below.

Safety Score		
<=2	Poor	
>2 and <=4	Below Average	
>4 and <=6	Average	
>6 and <=8	Above Average	
>8	Good	

RECOMMENDATIONS FOR AUDIT POINTS WITH 0 AND 1 SAFETY RATING

PARAMETER	DNCC	DSCC	RECOMMENDATIONS
	points with 0 safety rating		The four actionable parameters, Lighting, Walkpath, Visibility & Public Transport need attention to improve overall safety and accessibility for women and others in Dhaka. The total number of points with 0 and 1 rating are included here for ready reference. These points are geo-located and can be used to plan interventions.
Lighting	403	127	There are no street lights or light from any other sources at these points primarily because of unavailability of street lighting poles and/or non functional street lighting. Adding adequate street lighting infrastructure will improve actual access and safety perceptions in these areas.
Walkpath	155	232	There are no paths for walking available at these points. People walk on shared streets. Building dedicated footpath for pedestrians with clear, unobstructed and safe walking surfaces will improve access for all.
Visibility	574	374	No windows, balconies, entrances of shops or residences overlook the streets at these locations. Presence of high boundary walls, isolating the streets from the buildings is another reason for low visibility. Organising street vendors/informal shopping and street parking will improve visibility in these locations. Lowering high, opaque boundary walls and having more building entrances facing the streets will also improve visibility.
Public Transport	768	448	Bus stops, taxi or auto stands could not be reached within 10 minutes of walking distance at few locations in Dhaka, even though cycle rickshaws were available everywhere. Adding formal public transport stands/stops within 2-5 minutes of walking distance will provide public transport options and enhance access to it. It would also improve overall accessibility in the areas.

PARAMETER	DNCC	DSCC	RECOMMENDATIONS
	points with 1 safety rating		
Lighting	985	497	There are some street lights and/or light from other sources present at these points but the quality of lighting is poor and hence there is low visibility in these areas. Adding adequate street lighting infrastructure will improve actual access and safety perceptions in these areas.
Walkpath	1628	1376	Footpath is inaccessible at these points because of poor walking condition and unavailability of clear walking space. Removing footpath blockages, parking and having safe walking surfaces will improve accessibility at these locations.
Visibility	1090	639	Not many windows and entrances of shops or residences overlook the streets at these locations. Presence of high boundary walls, isolating the streets from the buildings is another reason for low visibility. Organising street vendors/informal shopping and street parking will improve visibility in these locations. Lowering high, opaque boundary walls and having more building entrances facing the streets will also improve visibility.
Public Transport	1019	808	Bus stops, taxi or auto stands could be reached within 5-10 minutes of walking distance at few locations in Dhaka. Cycle rickshaws were seen to be the only available transport mode at these locations. Adding formal public transport stands/stops within 2-5 minutes of walking distance will provide public transport options and enhance access to it. It would also improve overall accessibility in the areas.
Gender Usage			Very few women and children were in sight after dark. Only men could be seen using the streets and public spaces of Dhaka. Improving paramters like lighting, walkpath, visibility and public transport will have a positive impact on actual access and the perception of safety by women and others.

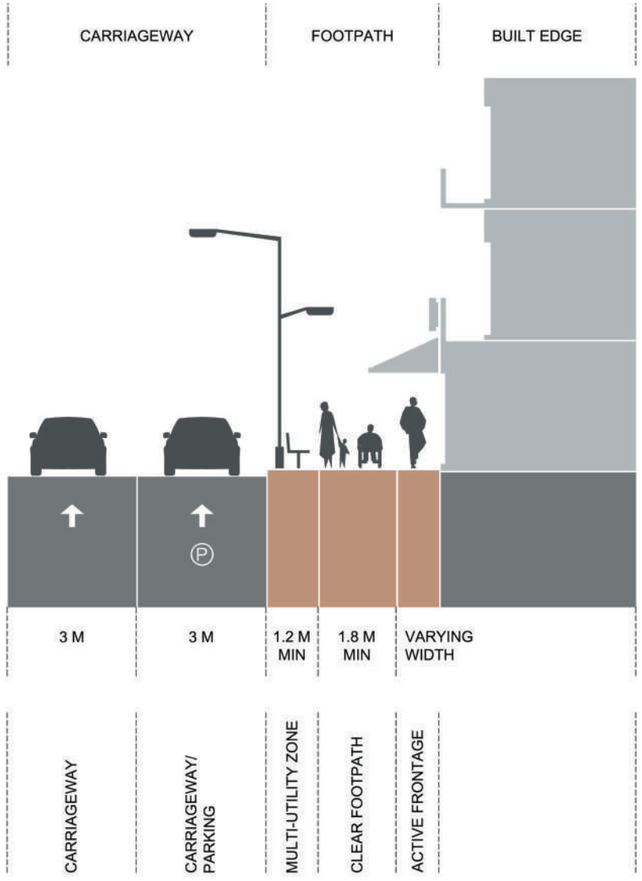
5.3.15 IMPROVE WALKABILITY BY ADOPTING INTERVENTION STRATEGIES

Walkpath is the only parameter which fared very poorly on the Safetipin visual analysis. This section includes some strategies which could address the current issues of the walkpath and make it safe, accessible and usable for all.

STRATEGY: REMOVE - REPAIR - RECLAIM

A three tiered action plan of remove, repair and reclaim could be adopted to improve access for all, especially the vulnerable groups - women, children, elderly and people with disability. The table given includes recommendations against each findings to incorporate these strategies. An illustration of a typical street section is given below to explain how the footpaths could be organised for safe access and better utility.

Footpaths have three main components:
Multi-utility Zone – Minimum 1.2 meter footpath width is required as multi-utility space for street utility, vendors and street furniture.
Pedestrian Walkway - Minimum 1.8 meter footpath width is needed for clear pedestrian access - the minimum width required for two people to move or pass each other.
Active Frontage – The area outside shops and houses where spill outs, display windows, entrances, verandas, bay windows, etc. are present. The width could vary depending on space available after allocating space for pedestrians and utilities.



TYPICAL STREET SECTION

Image on right

A typical section of an organised footpath

FINDINGS	RECOMMENDATIONS
	REMOVE obstructions out of the footpaths to provide clear walking space
OBSTRUCTIONS PRESENT ON THE FOOTPATHS	Images of types of obstructions present on the footpaths can be seen on Page 00
Shop encroachments / house extensions (DNCC - 106 & DSCC - 76)	Remove shop and/or house extensions blocking the existing footpaths to provide clear walking space (min 1.8m). Some spill over from shops could be allowed on the footpaths in the 'active frontage zone' (refer illustration/street section) depending on available space on the existing footpaths.
Temporary shops / vendors (DNCC - 605 & DSCC - 476)	Remove temporary shops and vendors occupying and blocking the existing footpaths to provide clear walking space (min 1.8m) and organise them on the carriageway side, in the multiutility zone (refer illustration/street section) part of the footpaths, wherever the footpath width is more than 1.8m - the minimum width required for two people to move. Vendors provide 'eyes on the street' and promote activity on the streets, together which make streets safer. Hence keeping vendors on streets is a mutually beneficial strategy and allocating space for them either on the footpaths or along the footpaths is crucial.
Electricity, signage and signal poles (DNCC - 41 & DSCC - 06)	Remove electricity, signage and signal poles out of the existing footpaths to provide clear walking space (min 1.8m) and arrange/align them on the carriageway side, in the multiutility zone (refer illustration/street section) part of the footpath, wherever the footpath width is more than 1.8m.
Telephone / communication boxes / power transformers (DNCC - 41 & DSCC - 06)	Remove telephone/communication boxes and power transformers out of the existing footpaths to provide clear walking space (min 1.8m) and arrange/align them on the carriageway side, in the multiutility zone (refer illustration/street section) part of the footpaths, wherever the footpath width is more than 1.8m.
Garbage dumps and construction debris (DNCC - 22 & DSCC - 30)	Remove garbage dumps and construction debris from the existing footpaths to provide clear walking space (min 1.8m). Plan and organise garbage collection points on the street at various locations to avoid spilling of garbage on the footpaths causing serious hazard and health issues.
Construction material blocking the footpath (DNCC - 105 & DSCC - 60)	Remove construction materials piled on and blocking the existing footpaths to provide clear walking space (min 1.8m). Allocate some space on every street for storing of construction material for all ongoing construction, repair or maintenance work.
Vehicle (two, four wheelers, cycle rickshaws) parked (DNCC 976 & DSCC - 806)	Remove two & four wheelers, autos, cycles and cycle rickshaws parked on existing footpaths to provide clear walking space (min 1.8m). Organise parking for two, four wheelers, autos, cycles and cycle rickshaws on shared lane (parking and driving) of the carriageway. Refer illustration/typical street section.
	REPAIR broken footpath and add accessibility elements
ACCESSIBILITY IMPEDEMENTS OF THE FOOTPATH	Images of types of footpath accessibility elements can be seen on Page 00
Non availability of Curb Ramps	Curb ramps are an essential component of footpaths for improving accessibility for all and could be only found in few locations in Dhaka. Add curb ramps to negotiate all level drops and make it step-free to reduce hazards for the vulnerable groups. Refer illustrations on Page 00.
Non availability of Zebra Crossings	Zebra crossings are vital elements of street design to ensure safe pedestrian crossover for all. Many street intersections as well as crossover points in Dhaka did not have zebra crossings. Add zebra crossings to all street intersections/crossovers for safe pedestrian access. Refer illustrations on Page 00.
Non availability of Median Breaks	Median breaks facilitate at grade street crossovers for pedestrians and are a crucial component for improving accessibility for all. There was no median break available at the intersections. Add median breaks to facilitate at grade crossover for all vulnerable groups. Refer illustrations on Page 00.
Height of the footpath	Footpath height should be not more than one step (150 mm) high as per international street design standards. Reduce overall footpath height to ensure easy, hazard-free, pedestrian access.
Surface of the footpath	Pedestrian, especially vulnerable groups need at grade walking surfaces. Footpath surfaces with missing, broken, dis-jointed paver blocks, manhole cover protruding out, other fixed objects pose as hazards for pedestrians. Ensure at grade, hazard-free walking surface.
Pedestrain Footover Bridge and Pedestrian Underpass	Pedestrians, especially vulnerable groups need at grade walking surfaces. Footover bridges without lifts are diificult to use by vulnerable groups. Women often carrying children and shopping bags find it diificult to climb up and down such facilities. Pedestrian underpasses have the same issues coupled with being very unsafe after dark. They are often deserted even when they are well lit at night. Investing in high qaulity, at grade walking surfaces with assessibility elemnets is far more beneficial than building expensive pedestrian footover bridges and underpasses in a densely built city like Dhaka.
	RECLAIM vehicular lanes for footpath widening
INSUFFICIENT SPACE AVAILABLE FOR PEDESTRIANS	Images of insufficient footpath space can be seen on Page 00
Varying footpath widths	Putting pedestrian over vehicle would ensure safe accessibility for all in Dhaka. Currently the streets function as shared streets with slower vehicular speed, as people and a range of daily activities occupy the streets. Yet, only able bodied adults are able to navigate these streets and that too with great difficulty. It is even more challenging for vulnerable groups to negotiate the uncertainties encountered frequently on these streets. Hence, providing dedicated footpaths, with clear walking space for pedestrians, on both sides of the streets must be strategized. This could be done by reclaiming parts of the vehicular lanes wherever possible to widen the existing footpaths which do not have adequate clear width for walking. It is important to provide minimum 1.8 meter footpath width for clear pedestrian access - the minimum width required for two people to move or pass each other. Another minimum footpath width of 1.2 meter is needed for multi-utility space to accommodate street utility, vendors and street furniture. Any extra space available after allocating the above two, could be added to 'active frontage' – the space outside the built edge. For illustration, refer typical street section on page 00.
Google Map Link and CSV Files	Please use the map links and the csv files shared in the project to view the collected data supported with images where obstructions, incorrect assessibility elements and insufficient width are present.

URBAN DESIGN **STRATEGIES**

Planned interventions

Unlike action points which are pragmatic in nature, long term public space intervention strategies look at the city holistically. These strategies serve the purpose of helping cities function better and more effectively. They make the connection between aspects that are linked but not so visible, such as the link between improved physical access and opportunities for a better life for women and others. Below are a few design principles as recommendations which would help Dhaka in achieving the overarching goal of 'safe access and participation in public life for women and others.'

1. MAKE WALKING SEAMLESS

Footpaths, curb ramps, crossings, footovers, underpasses

To make walking easy, safe and seamless walking routes must be in good condition and connected to a larger network of streets in the city. A good walking route must be well paved, well lit and free from any type of obstruction. Additionally all walking routes must be well connected to other routes and well designed with crossovers to have a seamless walking experience when travelling from point A to point B. This particularly benefits vulnerable users.

2. MAKE PUBLIC TRANSPORT EASILY ACCESSIBLE

Transport stops, routes, frequency, capacity, safety within transport

To make public transport within everyone's reach, various transportation systems functional in the city should be looked at. It is important to understand how one transport system interacts with the other and how people use them. Only then the gaps or overlaps between systems could be identified and improved to make them seamless. Such interventions to stitch different systems make the overall transport network accessible and allow people to switch within transport systems easily. Safety inside public transport is a very essential aspect to consider for women.

3. FOCUS ON LAST MILE CONNECTIVITY

Non-motorised transport, light motor vehicles, informal transport

Last mile connectivity is an important aspect of any public transportation system operating in the city. Strengthening informal transport like non-motorised vehicles and light motor vehicles which serve as first/last mile connectivity to one's origin and destination could be an useful way of ensuring seamless and safe travelling. Often women forego opportunities available in the city due to weak, unsafe or expensive first/last mile connectivity options.

4. MAKE STREETS ACTIVE

Mixed-use development, informal shopping, eyes on the streets

Active streets are safe streets. To make streets safe an optimum amount of activity on the streets and by the streets is required. Just the way over crowded streets tends to be unsafe, similarly under used streets are unsafe too. Streets which have enough people overlooking it from buildings next to it and have enough people present on it are safer. Encouraging mixed-used developments, on-street shopping, informal hawking and discouraging high, opaque boundary walls and front setback for buildings are good practices to make streets active round the clock.

5. MAKE STREETS INCLUSIVE

Employment in public services, representation in govt, advocacy and sensitisation programs

Ensuring women are employed and represented in public services and government include their perspective in planning, designing and maintaining public space. Participatory planning methods are useful ways of including women and other disadvantaged group's perspective into planning.

APPENDIX

This section includes the CSV files generated for Dhaka as examples. These files have geo location for each audit point along with the ratings of every parameter. Every audit point is also accompanied by the images collected at that particular audit location. These files could be integrated with any GIS platform and analysed further. These could be also seen on Google Maps for easy visualisation.

MY SAFETIPIN CSV FILE

S No	ID	Latitude	Longitude	Lighting	Walkpath	Public Transport	Visibility	People	Gender Usage	Security	Openness	Feeling	Safety Score	Comment	Image Link_1	Image Link_2
1	741868	13.123944	80.2970964	2	0	1	2	1	0	1	2	1	2.6	as this market area sc	http://api-android.s	http://api-android.s
2	741869	13.123531	80.2973861	2	0	1	2	2	1	0	2	1	3	in one zone after 10C	http://api-android.s	http://api-android.s
3	741870	13.1241778	80.2968984	2	0	1	2	1	0	2	2	2	4	one zone after 100m	http://api-android.s	http://api-android.s
4	741871	13.1246292	80.2967513	1	0	1	3	2	0	1	3	1	3.5	only males open can	http://api-android.s	http://api-android.s
5	741873	13.1255618	80.2969185	1	0	1	1	1	0	0	1	1	0.9	no females present h	http://api-android.s	http://api-android.s
6	741874	13.124451	80.2969636	3	0	1	2	2	0	1	2	2	4.1	police barricade was	http://api-android.s	http://api-android.s
7	741875	13.1276151	80.297645	2	0	1	3	2	0	0	1	1	2.6	I was standing for fev	http://api-android.s	http://api-android.s
8	741876	13.1285925	80.2980634	3	0	1	2	1	0	0	3	2	4	autos availablemales	http://api-android.s	http://api-android.s
9	741877	13.1284335	80.2983728	1	0	0	1	1	0	0	0	1	0.7	very few people no fe	http://api-android.s	http://api-android.s
10	741878	13.1284237	80.2979028	1	0	2	2	1	0	2	2	2	4	lighting pillars there	http://api-android.s	http://api-android.s
11	741879	13.1284237	80.2979028	2	1	3	2	1	0	0	2	3	4.2	main area entrance c	http://api-android.s	http://api-android.s
12	741880	13.1180919	80.2931607	3	3	1	2	2	2	2	1	2	4.4	main road so lights a	http://api-android.s	http://api-android.s
13	741881	13.1179075	80.2931089	2	1	2	3	1	1	1	1	2	4.1	pathway available bu	http://api-android.s	http://api-android.s
14	741882	13.1110994	80.2918932	1	2	2	3	2	2	3	3	3	4.6	police station was ve	http://api-android.s	http://api-android.s
15	741883	13.1104075	80.2919151	2	3	2	2	1	1	2	1	3	4.4	in the entrance gate (	http://api-android.s	http://api-android.s
16	741884	13.1099609	80.2918048	3	3	2	3	1	2	1	2	2	4.4	no stationary shops a	http://api-android.s	http://api-android.s
17	741885	13.1094973	80.2917571	3	3	2	3	2	2	2	1	2	4.5	main road vehicle bu	http://api-android.s	http://api-android.s
18	741886	13.1095133	80.2917435	3	3	3	3	2	2	2	3	3	4.8	open in all zones veh	http://api-android.s	http://api-android.s
19	741887	13.1097491	80.2917	3	3	2	2	1	2	1	1	2	4.3	females occupied eq	http://api-android.s	http://api-android.s
20	741888	13.1080246	80.2915283	3	3	3	3	3	3	3	3	3	5	traffic police availabl	http://api-android.s	http://api-android.s
21	741889	13.1086368	80.2883839	1	0	3	1	2	2	3	1	1	4.1	traffic police availabl	http://api-android.s	http://api-android.s
22	741890	13.1089603	80.2870464	1	0	3	2	2	1	3	3	2	4.3	police booth and ma	http://api-android.s	http://api-android.s
23	741891	13.1094017	80.2854288	0	0	2	1	1	1	0	1	1	1.3	very less lights peopl	http://api-android.s	http://api-android.s
24	741892	13.1093163	80.2853883	2	0	2	3	2	1	1	3	2	4.3	moving areas lightin(	http://api-android.s	http://api-android.s
25	741893	13.1257053	80.2878527	0	0	0	0	2	0	0	0	0	0.3	not safetasmac bar w	http://api-android.s	http://api-android.s
26	741894	13.1257731	80.2879651	3	0	3	1	1	0	0	2	1	3	unsafeno people crov	http://api-android.s	http://api-android.s
27	741895	13.1235824	80.2878952	3	0	3	3	3	1	3	3	2	4.6	many police are ther	http://api-android.s	http://api-android.s
28	741896	13.12345	80.2876262	3	0	3	3	2	2	3	3	3	4.7	more people Availab	http://api-android.s	http://api-android.s
29	741897	13.1233942	80.2879999	2	0	2	2	3	0	2	2	1	4.1	in entrance of the me	http://api-android.s	http://api-android.s
30	741898	13.1232331	80.2885023	2	0	2	2	2	2	0	1	2	4.1	many shops opnedd	http://api-android.s	http://api-android.s
31	741899	13.1228651	80.2887649	3	0	1	2	2	1	0	2	2	4.1		http://api-android.s	http://api-android.s
32	741900	13.1233423	80.2884864	1	0	1	2	2	2	0	2	2	4	females presence wa	http://api-android.s	http://api-android.s
33	741901	13.1228389	80.2897989	2	0	1	3	2	3	0	3	2	4.3	main Street of the ro	http://api-android.s	http://api-android.s
34	741902	13.1230698	80.2893569	3	0	1	3	2	2	0	2	2	4.2	all in one place mark	http://api-android.s	http://api-android.s
35	741903	13.1228596	80.2901906	3	0	1	3	2	1	0	2	2	4.1	space for the road is	http://api-android.s	http://api-android.s
36	741904	13.1227596	80.2909617	1	0	1	2	1	1	0	2	1	2	visibility is thereope	http://api-android.s	http://api-android.s
37	741905	13.1227404	80.2909663	2	0	3	3	2	2	0	2	2	4.3	entrance of the mark	http://api-android.s	http://api-android.s
38	741906	13.1230649	80.2890573	3	0	3	3	2	2	0	2	2	4.3	bus stop very near lig	http://api-android.s	http://api-android.s
39	741907	13.1227681	80.2913782	1	0	2	1	1	1	0	1	2	2.6	very few lightsfemale	http://api-android.s	http://api-android.s
40	741908	13.1229842	80.2893223	1	0	2	1	1	1	0	1	2	2.6	acceptable lights we	http://api-android.s	http://api-android.s
41	741909	13.1196154	80.2903986	1	0	3	2	1	1	0	2	2	4	lights was less auto s	http://api-android.s	http://api-android.s
42	741910	13.1195903	80.2903981	3	0	3	3	3	3	3	3	3	4.8	all open place main b	http://api-android.s	http://api-android.s
43	741911	13.1159433	80.2886644	3	0	2	2	1	3	0	1	2	4.1		http://api-android.s	http://api-android.s
44	741912	13.1166174	80.2873133	1	0	2	1	1	1	0	1	1	1.6	females feels comfor	http://api-android.s	http://api-android.s
45	741913	13.1169595	80.2857347	2	0	1	1	1	1	0	1	1	1.6	narrow streets lights	http://api-android.s	http://api-android.s
46	741914	13.1169694	80.2855112	3	3	3	2	2	2	0	2	2	4.4	walk path is there be	http://api-android.s	http://api-android.s
47	741915	13.1175677	80.284509	2	0	3	2	2	2	0	1	3	4.3	females are there in t	http://api-android.s	http://api-android.s
48	741916	13.1175677	80.284509	3	0	3	3	2	2	1	3	3	4.6	park is on closed due	http://api-android.s	http://api-android.s
49	741917	13.1176958	80.2845659	3	0	3	3	2	2	0	2	3	4.4	not bad things happe	http://api-android.s	http://api-android.s
50	741918	13.1187599	80.2851749	3	3	3	3	3	1	2	2	3	4.8	side space with lines	http://api-android.s	http://api-android.s
51	741919	13.1187599	80.2851749	2	0	3	1	2	1	3	1	2	4.2		http://api-android.s	http://api-android.s
52	741920	13.1187195	80.2851255	1	0	3	2	2	1	3	2	3	4.4	police female was th	http://api-android.s	http://api-android.s
53	741921	13.1185306	80.2850857	2	0	3	2	3	3	2	1	3	4.5	Females were morem	http://api-android.s	http://api-android.s
54	741922	13.1180821	80.284801	1	0	3	1	2	0	0	1	2	3	very few lights availa	http://api-android.s	http://api-android.s
55	741923	13.1175627	80.2845608	3	0	2	2	1	2	1	1	2	4.1	females present in th	http://api-android.s	http://api-android.s
56	741924	13.116773	80.2839344	3	1	2	2	2	1	2	1	2	4.3	some space is there i	http://api-android.s	http://api-android.s
57	741925	13.1161138	80.2835727	2	0	2	3	2	2	1	3	2	4.3		http://api-android.s	http://api-android.s
58	741926	13.1161138	80.2835727	2	0	2	2	2	1	0	2	2	4.1	all 4 places open can	http://api-android.s	http://api-android.s
59	741940	13.1141252	80.2821959	2	1	2	2	2	2	2	2	2	4.3	female mentioned th	http://api-android.s	http://api-android.s
60	741941	13.1138863	80.2826295	2	1	2	3	2	2	1	2	2	4.3	many female sellers a	http://api-android.s	http://api-android.s
61	741942	13.11421	80.2828858	1	0	2	2	2	1	0	1	2	3.5	more famales sellers	http://api-android.s	http://api-android.s
62	741943	13.1145547	80.282843	2	0	3	3	2	2	1	2	2	4.3	many shops open alv	http://api-android.s	http://api-android.s
63	741944	13.114709	80.2827255	2	0	3	2	2	2	1	2	3	4.4	roads need to be rep	http://api-android.s	http://api-android.s
64	741946	13.1144308	80.2831058	2	1	3	2	2	2	1	2	3	4.4	road is the major prc	http://api-android.s	http://api-android.s
65	741947	13.1142906	80.2834085	2	0	2	2	2	2	1	2	2	4.2	no parking for marke	http://api-android.s	http://api-android.s
66	741948	13.1141924	80.2830834	1	0	2	2	3	0	0	1	2	3.5	only males available	http://api-android.s	http://api-android.s
67	741949	13.1137284	80.2829251	1	0	2	2	2	2	1	1	2	4.1	if safety camera avail	http://api-android.s	http://api-android.s
68	741950	13.1141888	80.2827574	2	0	3	2	2	3	2	2	2	4.4	main road adjacent r	http://api-android.s	http://api-android.s
69	741951	13.1154323	80.2827524	2	2	3	2	2	2	2	1	3	4.5	parking space need t	http://api-android.s	http://api-android.s
70	741952	13.133675	80.2925784	2	1	3	2	2	1	2	3	2	4.4	more space is there b	http://api-android.s	http://api-android.s
71	741953	13.1346297	80.2927127	2	2	2	2	2	2	1	2	2	4.3	safe people always pr	http://api-android.s	http://api-android.s
72	741954	13.135827	80.2930023	1	2	2	2	1	1	1	1	2	4.1	lights were less parki	http://api-android.s	http://api-android.s
73	741955	13.1361983	80.2928531	2	1	2	2	2	3	1	3	2	4.4	more females occupi	http://api-android.s	http://api-android.s
74	741956	13.1342275	80.2926216	1	1	3	2	2	1	2	2	2	4.3	safe lights are less au	http://api-android.s	http://api-android.s
75	741957	13.1333539	80.2930574	1	0	2	1	1	0	1	1	1	1.6	it's purely seems com	http://api-android.s	http://api-android.s

SAFETIPIN NITE (DNCC) CSV FILE

S No	ID	Latitude	Longitude	Lighting	Walkpath	Public Transport	Visibility	People	Gender Usage	Security	Openness	Feeling	Safety Score	Comment	Image Link_1	Image Link_2
1	740309	13.1579438	80.3043026	3	1	2	2	2	3	0	2	2	4.3	D	https://safetipinima	https://safetipinimag
2	740307	13.1590721	80.3055471	3	1	3	1	2	0	0	3	2	4.2	D	https://safetipinima	https://safetipinimag
3	740173	13.1616995	80.3061801	3	2	3	2	2	0	1	3	2	4.4	D CM	https://safetipinima	https://safetipinimag
4	740171	13.1626606	80.3063572	3	2	3	3	2	1	1	2	2	4.4	D ZC	https://safetipinima	https://safetipinimag
5	740169	13.1634233	80.3064644	3	2	3	2	1	0	0	2	2	4.2	D	https://safetipinima	https://safetipinimag
6	740167	13.1643113	80.3066629	3	2	3	2	2	3	0	2	2	4.4	D GB CD	https://safetipinima	https://safetipinimag
7	740165	13.1651209	80.3069741	3	2	2	3	2	2	0	2	2	4.4	D	https://safetipinima	https://safetipinimag
8	740163	13.1657895	80.3073925	3	2	3	2	1	0	0	2	2	4.2	D	https://safetipinima	https://safetipinimag
9	740161	13.166432	80.3079772	3	2	3	2	2	1	0	2	2	4.3	D	https://safetipinima	https://safetipinimag
10	740251	13.1666357	80.3083152	3	1	3	2	0	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
11	740159	13.1670536	80.3085834	3	1	3	2	2	3	0	2	2	4.4	D	https://safetipinima	https://safetipinimag
12	740157	13.1677587	80.309608	3	2	3	1	1	0	1	2	2	4.2	D	https://safetipinima	https://safetipinimag
13	740155	13.1683437	80.3101498	3	2	3	1	0	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
14	740153	13.1689966	80.3105897	3	2	2	0	1	0	0	2	1	3	D GB	https://safetipinima	https://safetipinimag
15	740151	13.1698637	80.3109598	3	2	2	0	2	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
16	740149	13.1707256	80.3112549	3	2	3	0	0	0	0	2	1	3	D	https://safetipinima	https://safetipinimag
17	740147	13.1716344	80.3115284	3	2	3	0	0	0	0	2	1	3	D GB	https://safetipinima	https://safetipinimag
18	740145	13.1725224	80.3118181	3	2	3	0	2	0	0	2	1	4	D	https://safetipinima	https://safetipinimag
19	740110	13.1735723	80.3122419	3	2	3	0	1	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
20	740111	13.1745438	80.3125638	3	1	2	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
21	740112	13.1756563	80.3129715	3	2	3	1	1	0	0	2	1	4	D	https://safetipinima	https://safetipinimag
22	740102	13.176748	80.3135186	3	1	3	0	1	0	0	2	1	3	D	https://safetipinima	https://safetipinimag
23	740100	13.1777613	80.3138673	3	2	3	2	2	0	0	2	2	4.3	D	https://safetipinima	https://safetipinimag
24	740098	13.1787014	80.3141356	3	2	3	0	1	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
25	740096	13.1795789	80.3145164	3	1	3	0	0	0	0	2	1	2.6	D	https://safetipinima	https://safetipinimag
26	740094	13.1804773	80.3149402	3	2	3	0	1	0	0	2	1	3.5	D	https://safetipinima	https://safetipinimag
27	740088	13.1830261	80.3161955	3	1	3	1	2	0	3	3	2	4.4	D	https://safetipinima	https://safetipinimag
28	740113	13.1838827	80.3159326	3	1	3	1	1	0	1	2	1	4	D CD	https://safetipinima	https://safetipinimag
29	740114	13.1842222	80.3149724	3	1	3	1	2	0	2	2	2	4.3	D	https://safetipinima	https://safetipinimag
30	740115	13.1843946	80.3145379	3	1	3	0	2	0	2	2	2	4.2	D	https://safetipinima	https://safetipinimag
31	740116	13.1846296	80.3136796	3	1	3	1	2	0	3	2	2	4.3	D ZC	https://safetipinima	https://safetipinimag
32	740136	13.1848124	80.3130359	3	1	3	2	1	3	3	2	2	4.5	D ZC	https://safetipinima	https://safetipinimag
33	740135	13.1850213	80.3120166	3	3	2	0	0	0	2	2	1	4	D	https://safetipinima	https://safetipinimag
34	740134	13.1852146	80.3110886	3	3	1	0	0	0	1	2	1	3	D	https://safetipinima	https://safetipinimag
35	740133	13.1854444	80.3100318	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
36	740132	13.1856638	80.3090823	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
37	740131	13.1858257	80.3081703	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
38	740130	13.1860555	80.3070813	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
39	740129	13.1862487	80.306164	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
40	740128	13.1863793	80.3051662	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
41	740127	13.1862331	80.3042275	3	2	0	0	0	0	0	2	1	1.6	D	https://safetipinima	https://safetipinimag
42	740126	13.1861391	80.3036803	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
43	740125	13.186489	80.304544	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
44	740124	13.1864681	80.3055686	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
45	740123	13.1862958	80.3064966	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
46	740122	13.1860764	80.307489	3	3	0	0	1	3	0	2	2	4.1	D	https://safetipinima	https://safetipinimag
47	740121	13.1858988	80.3084654	3	3	0	0	1	3	0	2	2	4.1	D	https://safetipinima	https://safetipinimag
48	740120	13.1856586	80.3093451	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
49	740119	13.1854183	80.310595	3	3	0	0	0	0	0	2	1	2	D	https://safetipinima	https://safetipinimag
50	740118	13.1852198	80.3115606	3	3	3	2	2	1	2	2	2	4.5	D	https://safetipinima	https://safetipinimag

SAFETIPIN NITE (DSCC) CSV FILE

S No	ID	Latitude	Longitude	Lighting	Walkpath	Public Transport	Visibility	People	Gender Usage	Security	Openness	Feeling	Safety Score	Comment	Image Link_1	Image Link_2
1	740812	13.186489	80.3054237	3	3	0	0	0	0	0	2	1	2	N	https://safetipinimages.s3.amazonaws.co	
2	740810	13.1863375	80.3060997	3	3	0	0	0	0	0	2	1	2	N	https://safetipinima	https://safetipinimag
3	740808	13.1861495	80.307135	2	3	0	0	0	0	0	2	1	1.6	N	https://safetipinima	https://safetipinimag
4	740807	13.1859197	80.308063	3	3	0	0	0	0	0	2	1	2	N	https://safetipinima	https://safetipinimag
5	740806	13.1856951	80.3090555	3	3	0	0	0	0	0	2	1	2	N	https://safetipinima	https://safetipinimag
6	740805	13.1855071	80.3100747	3	3	0	0	0	0	0	2	1	2	N	https://safetipinima	https://safetipinimag
7	740804	13.1853086	80.3110886	3	3	1	0	0	0	1	2	1	3	N	https://safetipinima	https://safetipinimag
8	740803	13.1851101	80.3119254	3	3	2	0	1	0	2	2	2	4.2	N	https://safetipinima	https://safetipinimag
9	740802	13.184896	80.3131807	3	1	3	0	2	0	3	2	2	4.3	N	https://safetipinima	https://safetipinimag
10	740801	13.1846662	80.3141141	3	1	3	0	1	3	3	2	2	4.4	N	https://safetipinima	https://safetipinimag
11	740800	13.1843476	80.3150046	3	1	3	0	0	0	2	2	1	3.5	N	https://safetipinima	https://safetipinimag
12	740799	13.1840029	80.3159165	2	1	3	0	2	0	1	2	1	3.5	N	https://safetipinima	https://safetipinimag
13	740787	13.1828642	80.3159863	3	0	3	0	2	2	0	2	2	4.1	N	https://safetipinima	https://safetipinimag
14	740789	13.1819815	80.3155732	3	0	3	0	0	0	0	3	1	2.6	N	https://safetipinima	https://safetipinimag
15	740790	13.1811145	80.3151387	3	0	2	0	0	0	0	2	1	1.6	N	https://safetipinima	https://safetipinimag
16	740791	13.180237	80.3147042	3	0	3	0	1	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
17	740792	13.1793543	80.3142858	3	0	3	0	2	0	0	2	1	3	N	https://safetipinima	https://safetipinimag
18	740793	13.1785238	80.31398	3	0	3	1	1	0	0	2	1	3	N	https://safetipinima	https://safetipinimag
19	740785	13.1778344	80.3138942	3	0	3	0	1	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
20	740794	13.1767219	80.3135079	3	0	3	0	1	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
21	740873	13.1771188	80.3129447	2	1	3	2	1	3	0	3	2	4.3	N	https://safetipinima	https://safetipinimag
22	740871	13.177286	80.3119469	2	1	3	2	1	0	0	2	1	3.5	N	https://safetipinima	https://safetipinimag
23	740869	13.1775523	80.3110403	2	2	2	1	0	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
24	740867	13.1777978	80.310123	1	2	2	2	1	3	1	2	2	4.3	N	https://safetipinima	https://safetipinimag
25	740865	13.1780955	80.3090823	2	3	2	2	1	0	0	2	1	4	N	https://safetipinima	https://safetipinimag
26	740863	13.1784194	80.308063	2	3	3	1	1	0	0	2	1	4	N	https://safetipinima	https://safetipinimag
27	740809	13.1798087	80.307532	2	1	3	3	3	2	1	2	2	4.4	N	https://safetipinima	https://safetipinimag
28	740776	13.1799706	80.3082401	2	1	3	3	2	0	0	2	2	4.2	N	https://safetipinima	https://safetipinimag
29	740778	13.1796729	80.3092325	2	1	2	3	2	1	0	2	2	4.2	N	https://safetipinima	https://safetipinimag
30	740780	13.1793752	80.3102249	2	1	2	2	2	1	0	2	2	4.1	N	https://safetipinima	https://safetipinimag
31	740782	13.1791506	80.3110564	2	1	1	2	1	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
32	740784	13.1788477	80.3120649	2	1	1	2	2	0	0	2	1	3	N	https://safetipinima	https://safetipinimag
33	740786	13.178597	80.3128588	2	1	2	1	2	0	0	2	1	3	N	https://safetipinima	https://safetipinimag
34	740788	13.1783776	80.3136206	2	1	3	1	2	2	0	3	2	4.3	N	https://safetipinima	https://safetipinimag
35	740783	13.1785656	80.3141087	2	0	3	0	0	0	0	2	1	1.6	N	https://safetipinima	https://safetipinimag
36	740781	13.1793387	80.314436	2	0	3	0	0	0	0	2	1	1.6	N	https://safetipinima	https://safetipinimag
37	740779	13.1805139	80.3149349	3	0	3	0	1	0	0	2	1	2.6	N	https://safetipinima	https://safetipinimag
38	740777	13.181407	80.3153533	2	0	2	0	0	0	0	2	1	1.3	N	https://safetipinima	https://safetipinimag
39	740775	13.1822584	80.3157932	2	0	3	0	0	0	0	2	1	1.6	N	https://safetipinima	https://safetipinimag
40	740773	13.1831411	80.3162009	2	1	3	0	2	0	1	3	1	4	N	https://safetipinima	https://safetipinimag
41	740841	13.1678005	80.3034979	3	1	3	3	3	1	1	2	2	4.4	N	https://safetipinima	https://safetipinimag
42	740829	13.1677483	80.3042758	2	1	3	2	2	2	1	2	2	4.3	N	https://safetipinima	https://safetipinimag
43	740827	13.1685318	80.3044528	2	1	3	1	1	0	1	2	1	3.5	N	https://safetipinima	https://safetipinimag
44	740825	13.1696548	80.3047103	3	1	3	3	3	1	1	2	2	4.4	N	https://safetipinima	https://safetipinimag
45	740823	13.1704644	80.3049302	2	1	3	2	2	0	1	2	2	4.2	N	https://safetipinima	https://safetipinimag
46	740821	13.1712792	80.3051287	3	1	3	2	3	1	1	2	2	4.4	N	https://safetipinima	https://safetipinimag
47	740820	13.1722246	80.3054023	3	1	3	1	2	0	1	2	2	4.2	N	https://safetipinima	https://safetipinimag
48	740819	13.1727574	80.3055471	2	1	3	1	1	0	0	2	1	3	N	https://safetipinima	https://safetipinimag
49	740818	13.1736088	80.3057939	2	1	3	1	1	0	1	3	1	4	N	https://safetipinima	https://safetipinimag
50	740817	13.1744498	80.3060353	3	2	3	0	0	0	1	2	1	3.5	N	https://safetipinima	https://safetipinimag

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