

Using Data to Build Safer Cities

Delhi | Bogota | Nairobi



Using Data to Build Safer Cities

Cities Alliance
Cities Without Slums

SAFETIPIN
Supporting Safer Cities

Acknowledgements

We are thankful to our partners for their support and collaboration in data collection and advocacy.



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Introduction

Urbanization is one of the key processes of social change taking place today. In 2003, the world became more than 50% urban and this is growing each year. The growth of cities has provided opportunities for education, employment and habitation for millions of people. At the same time, growing urbanization has also exacerbated existing problems as well as thrown up new problems. These include congestion, poverty, pollution and crime among others. Urban spaces provide new opportunities for people to build their homes and lives, while reinforcing existing inequalities and often creating new ones.










Safety of citizens and freedom from crime and violence in cities has become a central concern with growing urbanization. Women and others such as elderly, migrants and people in low income neighborhoods are particularly vulnerable and face safety as a major concern. City governments and other stakeholders such as the police are responsible for providing infrastructure and services to make cities safer for everyone. Creating safe and inclusive public spaces has been recognized as important both through SDG11 as well as the New Urban Agenda. Well designed and well maintained public spaces are essential for the well being of city inhabitants and promote sustainability as well as safety.

This project 'Using Data to build Safer Cities' supported under the Cities Alliance Catalytic Fund has been carried out to provide reliable data to city governments to address this problem as well as suggest solutions to create safer and inclusive public spaces. The project has been implemented in three cities across continents - Delhi (India), Bogota (Colombia) and Nairobi (Kenya). It has been carried out in partnership with Nairobi City County, District Secretary of Women, Bogota and Government of National Capital Territory (NCT), Delhi. The role of local government is crucial in addressing the safety concerns through urban management and governance.

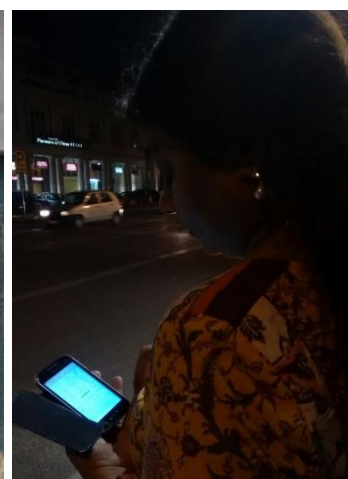
In each city, data was collected using the Safetipin apps and technology platform and shared with local stakeholders. The data has been collected with the aim of identifying key problem and areas for improvement. This report shares the findings from the data collection in all three cities as well how the data has been used by the cities to create safer and more inclusive public spaces and streets. Some of the changes recommended include designing streets to reduce opportunities for crime, improved street lighting, reorganizing markets and bus terminals, addressing last mile connectivity and encouraging community participation in designing and managing streets and public spaces.

Methodology

Safetipin, is a technology platform which works to make communities and cities safer by providing safety-related information collected by users and by trained auditors. At the core of the app is the Safety Audit. A Safety Audit is a participatory tool for collecting and assessing information about perceptions of urban safety in public spaces. The audit is based on nine parameters – Lighting, Openness, Visibility, Crowd, Security, Walkpath, Availability of Public Transport, Gender Diversity and Feeling. Each parameter is rated 0/1/2/3 with 0 being Poor rating and 3 being Good. All parameters except Feeling are completely objective and are rated on the basis of a well defined rubric. The app is available in the app stores for free, and was used by trained volunteers in collaboration with NGO partners and City Government to conduct audits. The audits were conducted post sunset till 10pm at night. Data was also collected using the Safetipin Nite app. This app (not available in app stores) collects photographs which are geotagged and have time stamps. Phones with this app installed were mounted on the windshield of cars. As the car moves, photographs are continuously taken of the footpath side of the road. In addition to taxis, smartphones were mounted on bicycles to capture the photographs of the cycle track in Bogota. The photographs were analysed by a team of coders and reviewed on a daily basis to produce maps of the city. Additional data indicating the issue (absence of streetlights, non functioning streetlights, broken or no pavement, type of public transport) was also recorded for the parameters of Lighting, Walkpath, Visibility and Public Transport.

 Light(Night)	Lighting measures the amount of illumination at a place and ranges from Dark to Bright. A place can be lit by street lighting or from other sources.
 Openness	Openness refers to whether a person has a good line of sight in all directions.
 Visibility	Visibility refers to how visible is one to others. It is based on the principle of 'eyes on the street'.
 People	Crowd indicates the number of people around. This increases as a consequence of usage opportunities.
 Security	Security refers to visible security offered either by the police or private security.
 Walk Path	Walkpath indicates whether a person can comfortably walk at a place. This could refer to the quality of a pavement or space along a road.
 Public Transport	Transport refers to the ease of accessing any mode of public transport i.e. metro/bus/auto/taxi etc. and is measured in terms of the distance to the nearest mode.
 Gender Usage	Gender is about diversity i.e. the percentage of women and children amongst the crowd
 Feeling	Feeling indicates how safe one feels at a place. It is the only subjective parameter.

The aggregate of all nine parameter ratings is used to generate a Safety Score for a particular location point.





DELHI

Delhi, or the National Capital Territory (NCT) of Delhi, is a city and Union Territory of India. It is also one of the five mega cities of India i.e. it has a population of more than 10 million. Having an average density of 225pph the city spans over 1483 square kilometers. As per Census of India 2011, it currently has a population of 16,349,831 which makes it the most populous urban agglomeration of India and the third largest urban area in the world. The United Nations World Cities Report 2016 says that an additional 9.6million people are expected to move to Delhi by 2030.

Being a union territory, the political administration of the NCT of Delhi today more closely resembles that of a state of India, with its own legislature, Lieutenant Governor, Legislative Assembly and an executive council of ministers headed by a Chief Minister. Delhi has been divided into 11 revenue districts. Members of the legislative assembly are directly elected for each of the 70 territorial constituencies in the NCT. The three Municipal Corporations – North, South and East handle civic administration for the city along with the New Delhi Municipal Council and the Delhi Cantonment Board.



Analysis & Findings

Delhi has been given a Safety Score of 3.3 on 5 based on the safety audits collected. A total of 44,396 safety audits have been collected. Of these 5,296 audits were conducted by app users and 39,100 were generated using the Safetipin Nite app covering 3,910 kilometers of road length.

Audits indicate that 50% of the area audited has a Safety Score of 4.0 or above. 6% of the audit locations have been given a Safety Score of less than 1.0. Another 9% of the audit points have a Safety Score ranging between 1.0 to 1.9 and 14% have a score from 2.0 to 2.9. 21% of the audit pins have a Safety Score from 3.0 to 3.9.

Of the nine parameters, Security and Gender Usage have been given a poor rating. Visibility and Crowd parameters have been rated Below Average. Access to Public Transport facilities has been rated as Average. Lighting, Openness and Walkpath have been rated Above Average. The Feeling of safety has been rated as Average for the city.

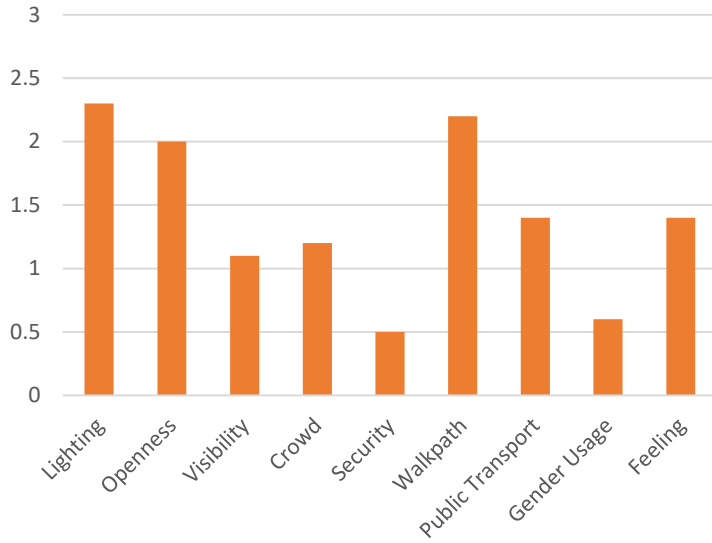
The safety rating varies largely on account of the infrastructure provision as well as social usage of the space. Areas which are well lit, have proper footpaths, access to public transportation and are active through the presence of people and "eyes on the street", tend to be safer. The Feeling parameter is directly impacted by the other eight parameters. Lighting, Walkpath, Public Transport and Visibility are infrastructural parameters and can be improved upon. Improving the condition of these parameters would result in more people especially women using public places at night.

Data analysis indicates that the parameter of Lighting has the maximum impact on the perception of safety followed by Gender Usage and Visibility. Also, each parameter has a different impact potential on the overall perception of safety. Improving the parameter with greater impact potential would result in a higher increase of the Safety Score.

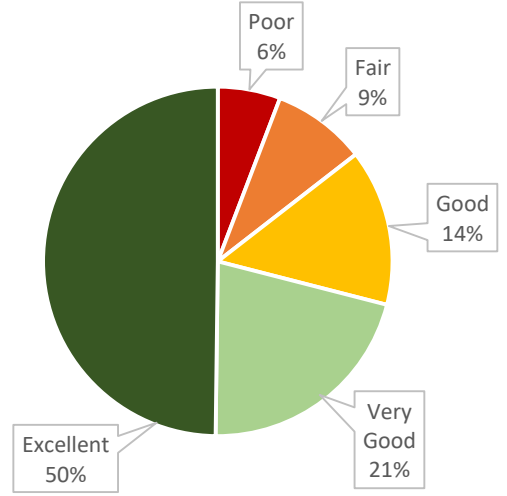
Lighting has the maximum impact on the perception of safety followed by Gender Usage and Visibility.



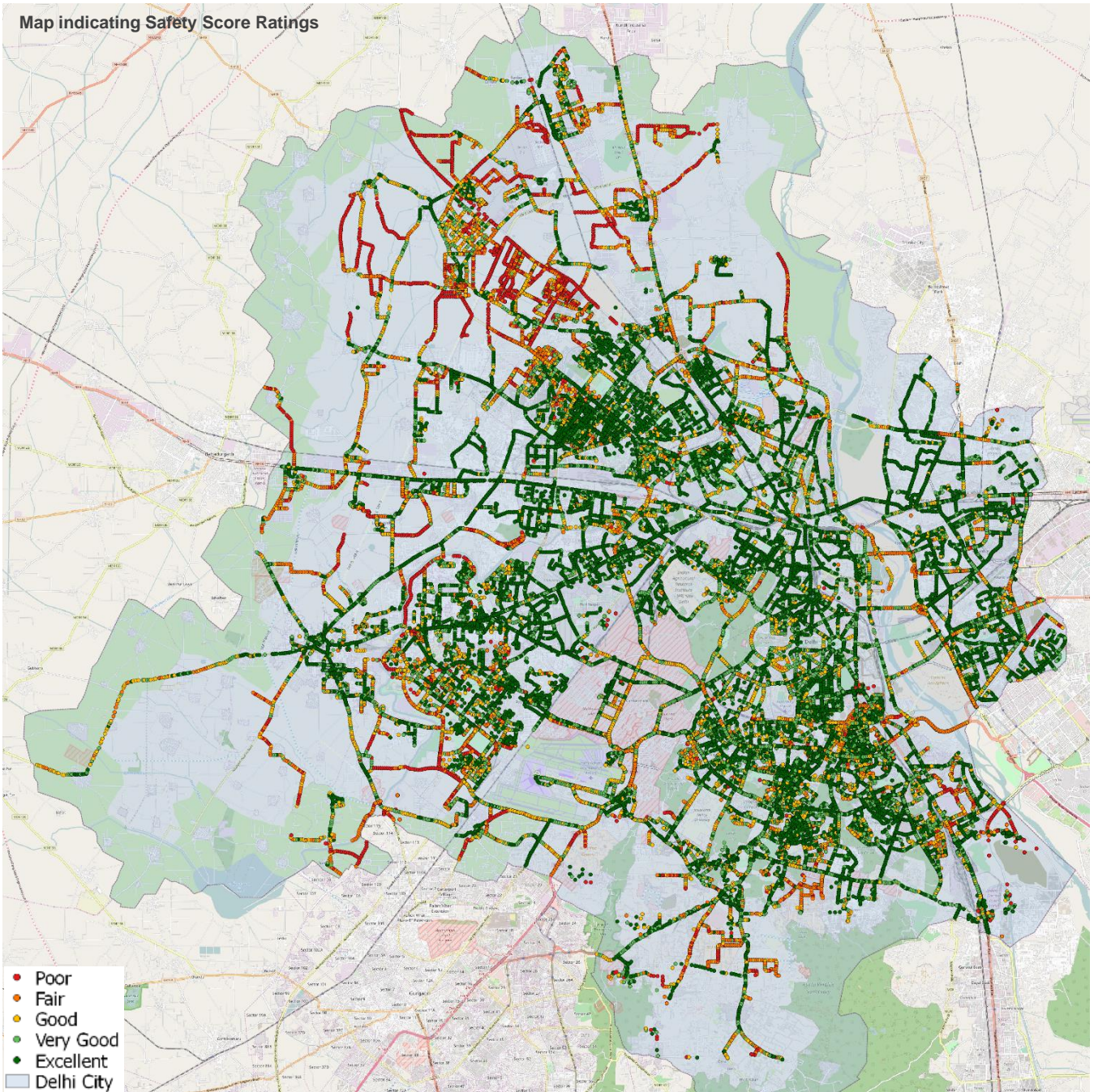
Average Parameter Ratings



Percentage Distribution of Safety Score

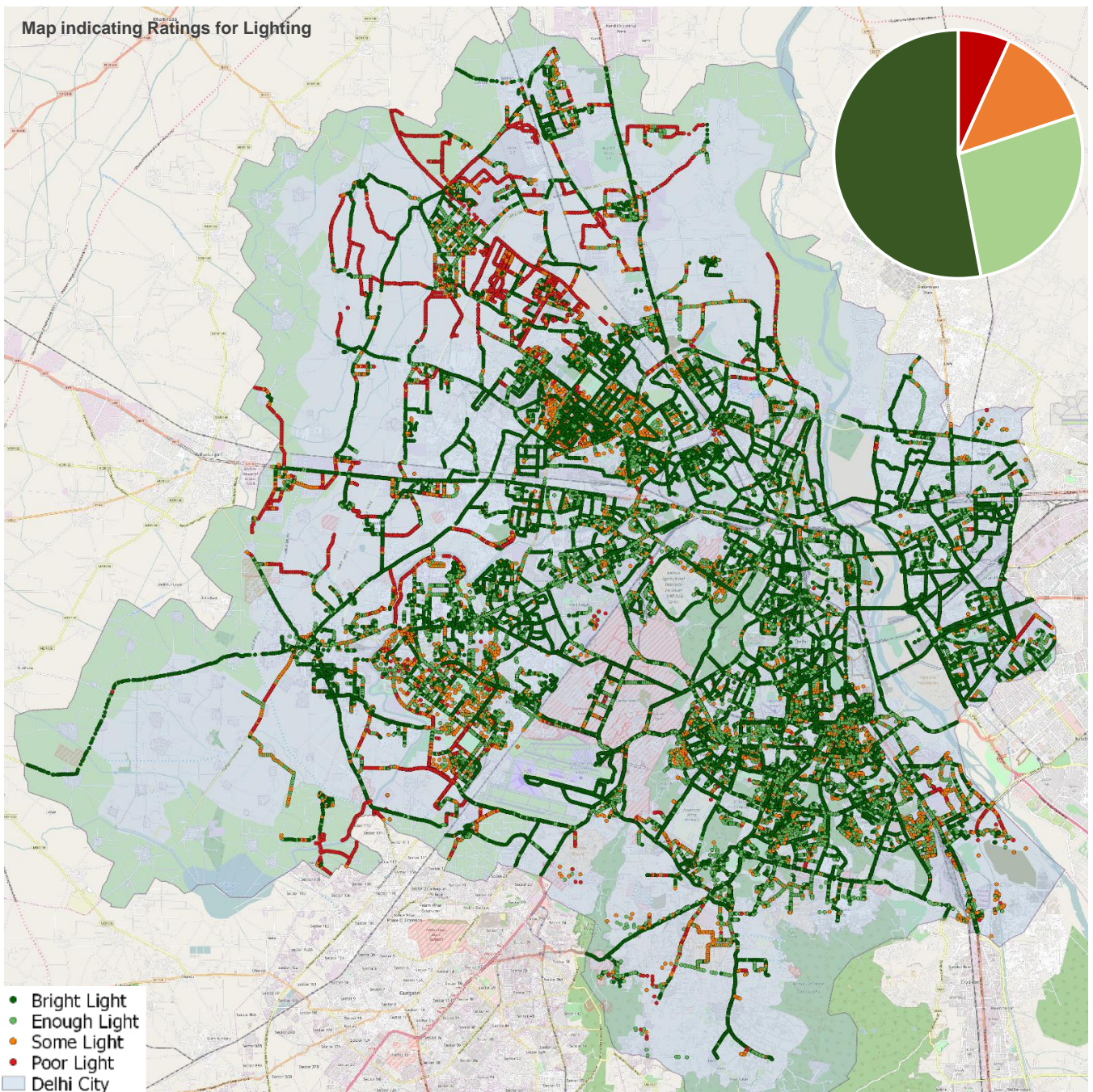
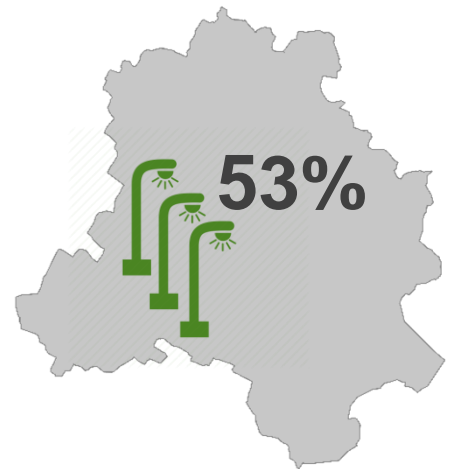


Map indicating Safety Score Ratings



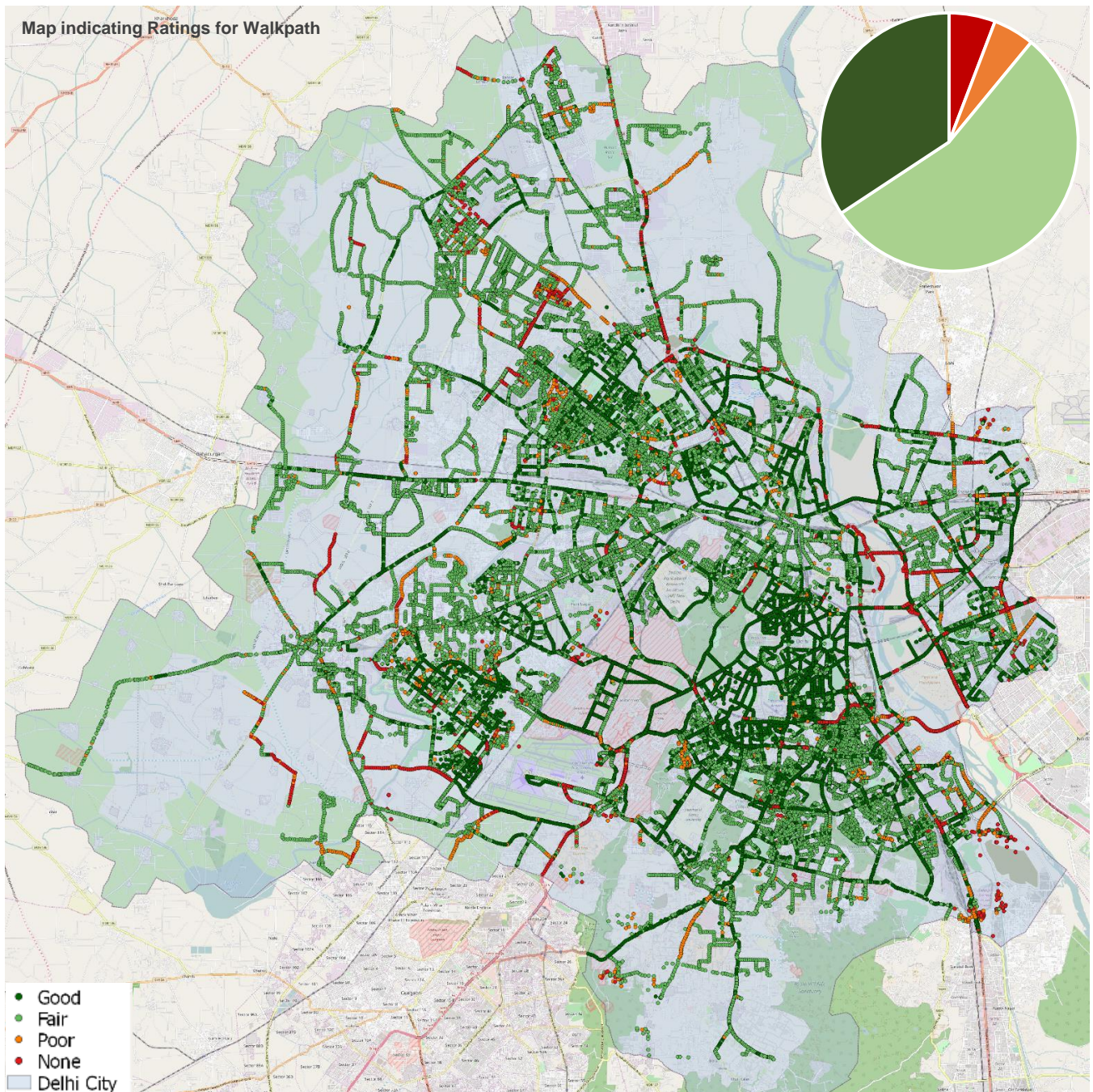
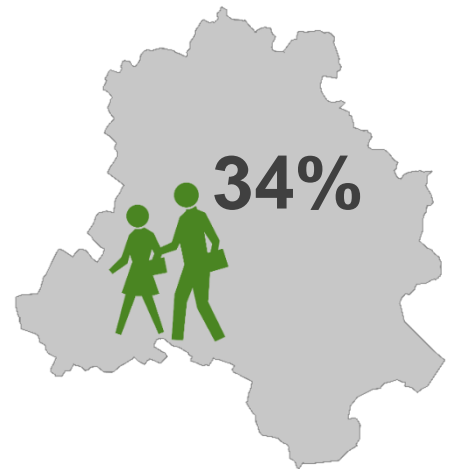
Lighting

The Lighting parameter has been rated 2.3/3 i.e. Above Average. 53% of the audit area was found to be brightly lit while another 27% was adequately lit. 7% of the audited locations were found to be completely dark i.e. there was no illumination from any source at these points. 13% of the audit locations were found to be poorly lit. It was found that streetlights installed only along central median resulted in well lit roads but dim lit footpath.



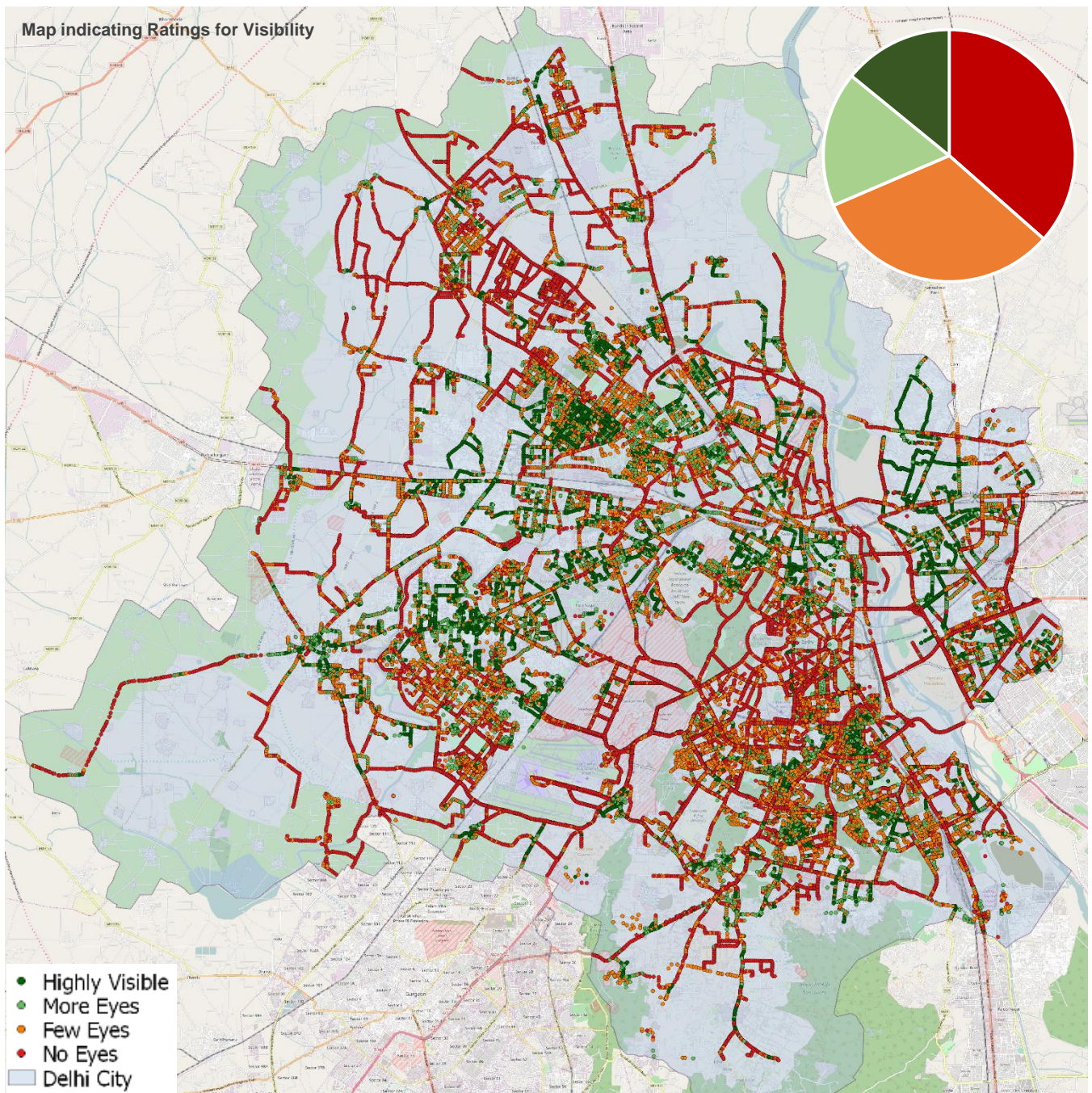
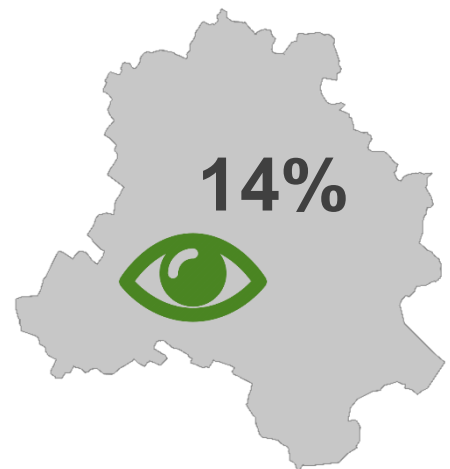
Walkpath

Safety audits indicate that only 34% of the audit locations have a walkpath in good condition. 55% locations have a walkpath in mostly fair condition for one to walk on but if one needs to escape they cannot run comfortably. In 6% of locations there is no walkpath for people to walk on and in another 5% while the walkpath is there it is in a poor condition making it difficult for people to actually walk on it. Overall the walkpath parameter has been rated 2.2/3 i.e. Above Average.



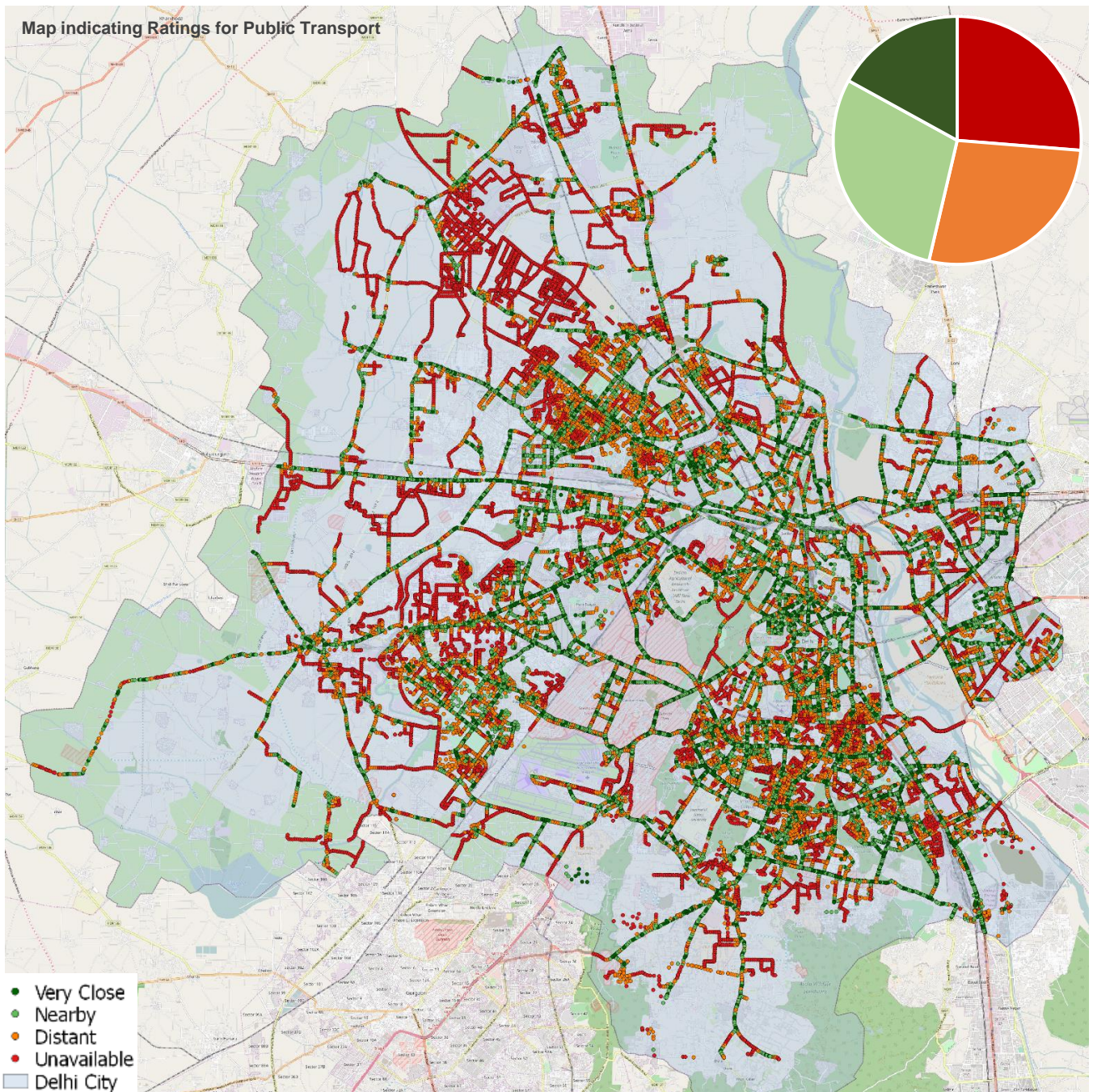
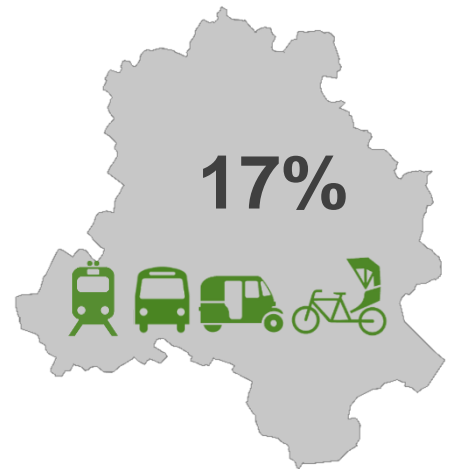
Visibility

The visibility parameter has been rated below average with a rating of 1.1/3. Only 14% of the city offers good visibility to a pedestrian out at night. 17% of audit locations offer some visibility. 32% of the city audited has few eyes on the street whereas 37% of the locations do not offer any visibility at night. This is predominant in the areas where the street edge is defined by high boundary walls. The residential areas and areas with mixed-use offer good visibility.



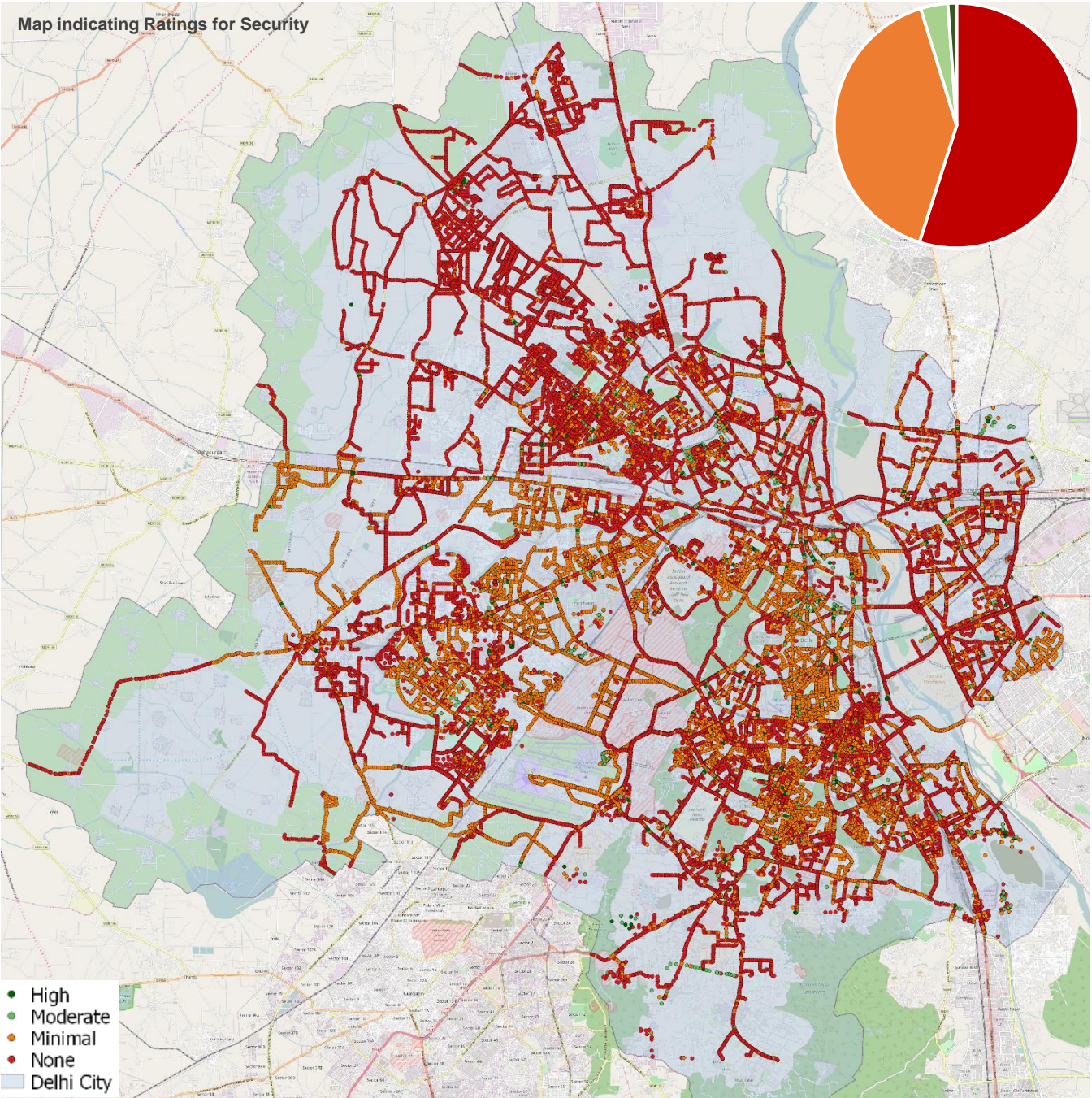
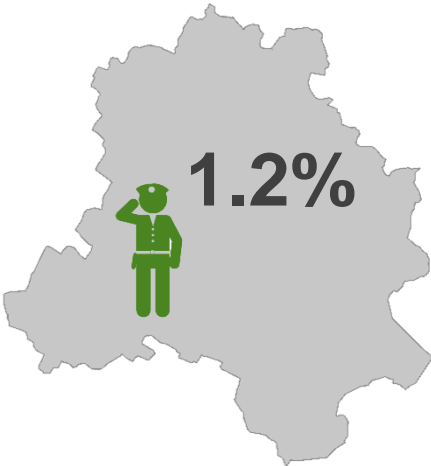
Public Transport

The Public Transport parameter has been rated 1.4/3 i.e. Average. Only 17% of the city audited offers access to any form of public transport facility within a distance of 50m i.e. within a 2 minutes walk. 29% of locations are accessible by a source within 50m-150m and 28% between 150m-400m. 26% of the total locations audited do not offer access to any form of public transport within 400m i.e. within a 10minutes walking distance. While 69% of the city is served by the bus network, 7.5% is accessed by metro stations.



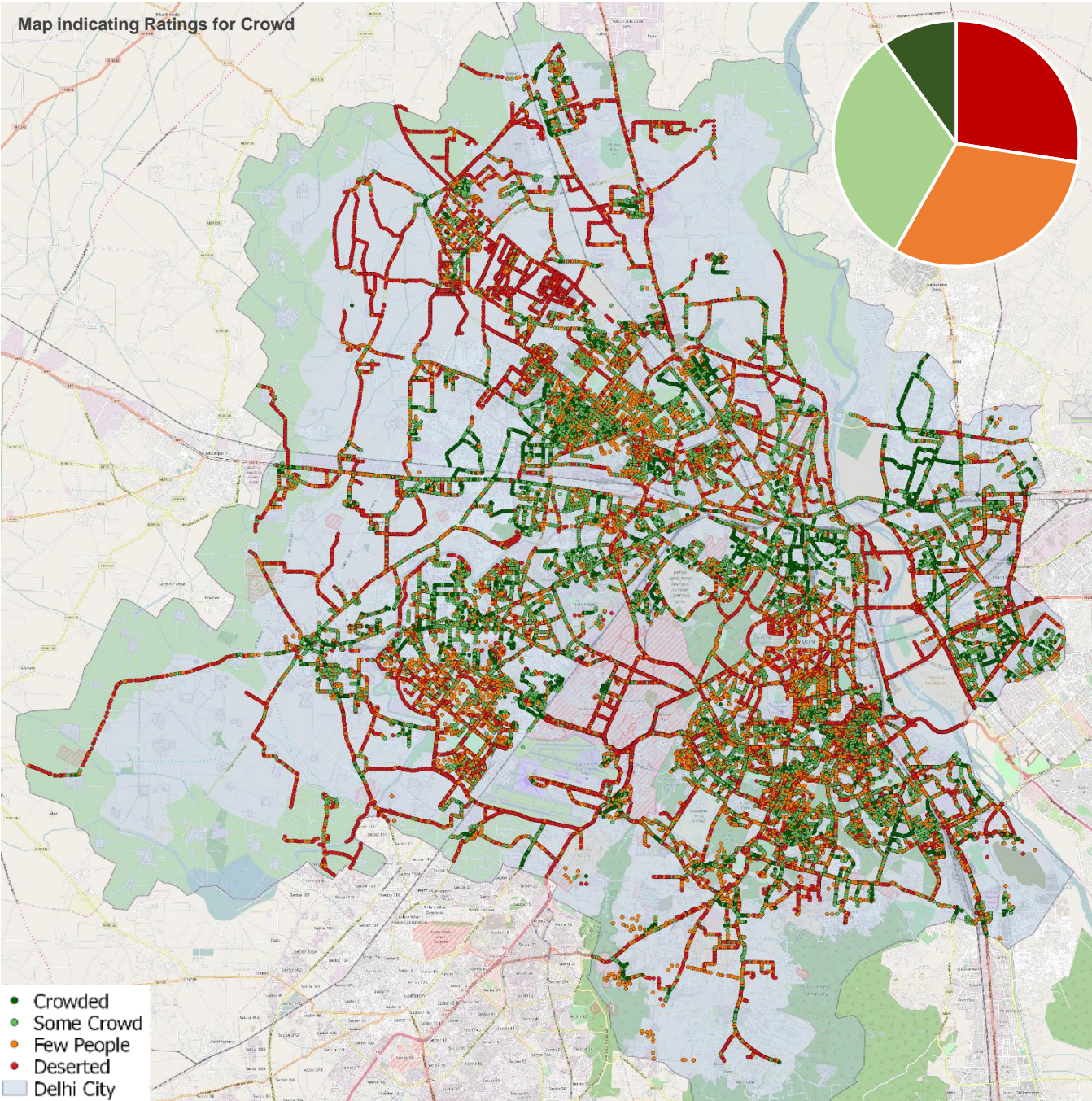
Security

Safety audits indicate that the Security parameter has been rated poorly i.e. 0.5/3 with only 1.2% of the audit locations being rated as highly secure and another 3.8% locations rated as likely to be secure. 40% of the locations are possibly secure on account of private security in the vicinity or Police Patrol. 55% of the city audited does not offer any kind of police or private security at night.



Crowd

The Crowd parameter has been rated Below Average i.e. 1.2/3. In Delhi, 10% of the locations audited are crowded having many people within touching distance. 32% of locations have some crowd and 31% of locations have few people using them. 27% of the audited locations were found to be completely deserted at night. Presence of people adds to the sense of security at a place. As Delhi does not see many people in the public places at night, this further works as a deterrent making places feel less safe.





BOGOTA

Bogotá is the capital and largest city of Colombia. With more than seven million residents, it is also the fourth largest city in South America. A picturesque, spacious city, Bogotá is on a high, fertile plateau and has cool and moist climate. It is the political, economic, administrative, industrial, artistic, cultural, and sports centre of the country and has 19 localities, or districts, forming an extensive network of neighbourhoods.

The city has a population of around 8 million and is constantly expanding in size to meet this influx of people. The population of Bogotá is increasing at a rate close to 5% per year, mostly due to people coming from rural areas of Colombia.



Analysis & Findings

Bogota has been given a Safety Score of 4.0 on 5 based on the safety audits collected. A total of 19,351 safety audits have been collected. The audits generated using the Safetipin Nite app covered 1,927 kilometers of road length.

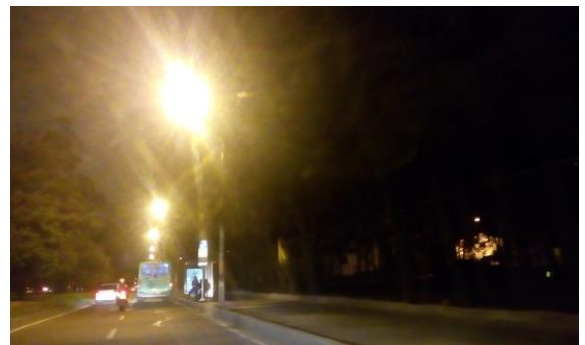
Audits indicate that 81% of the area audited has a Safety Score of 4.0 or above. Another 1% of the audit points have a Safety Score ranging between 1.0 to 1.9 and 3% have a score from 2.0 to 2.9. 15% of the audit pins have a Safety Score from 3.0 to 3.9.

Of the nine parameters, Security and Gender Usage have been given a poor rating. Crowd has been given Below Average rating. Access to Public Transport facilities, Openness, Visibility have been rated as Above Average. Lighting, and Walkpath have been rated Good. The Feeling of safety has been rated as Average for the city.

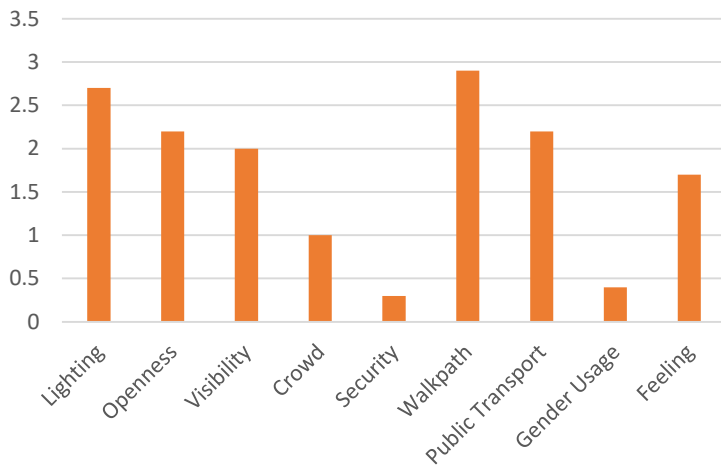
The safety rating varies largely on account of the infrastructure provision as well as social usage of the space. In terms of infrastructure, Bogota boasts of properly paved footpaths, separate cycle tracks, well-planned BRTS etc. However, the city's streets become inactive post sunset, owing to lack of activity and crowd. The Feeling parameter is directly impacted by the other eight parameters. Lighting, Walkpath, Public Transport and Visibility are infrastructural parameters and can be improved upon. Improving the condition of these parameters would result in more people especially women using public places at night.

Data analysis indicates that the parameter of Lighting has the maximum impact on the perception of safety followed by Visibility and Security. Also, each parameter has a different impact potential on the overall perception of safety. Improving the parameter with greater impact potential would result in a higher increase of the Safety Score.

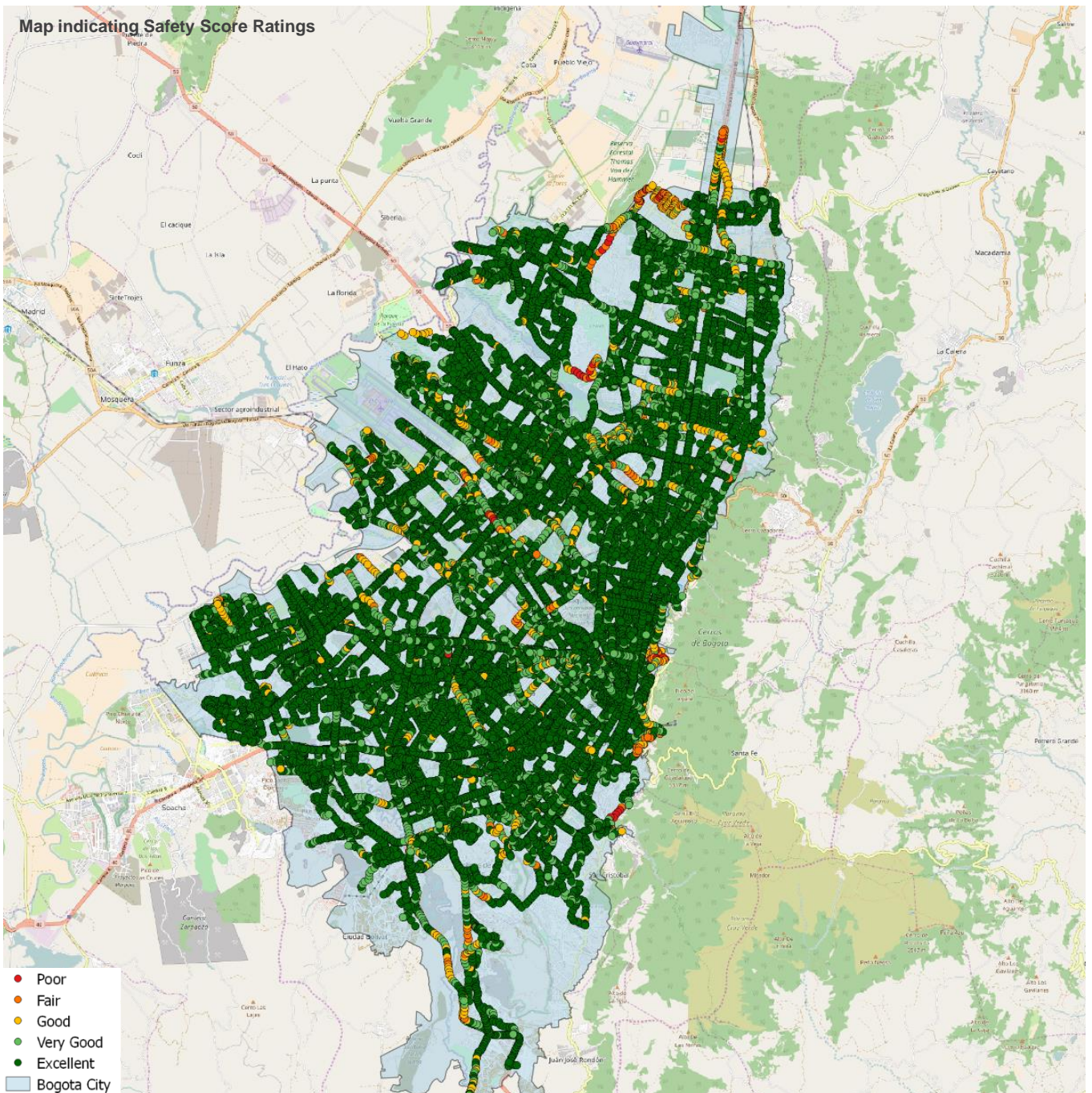
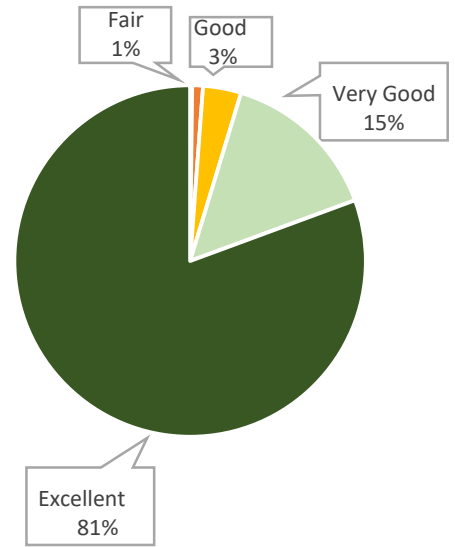
Lighting has the maximum impact on the perception of safety followed by Visibility and Security.



Average Parameter Ratings

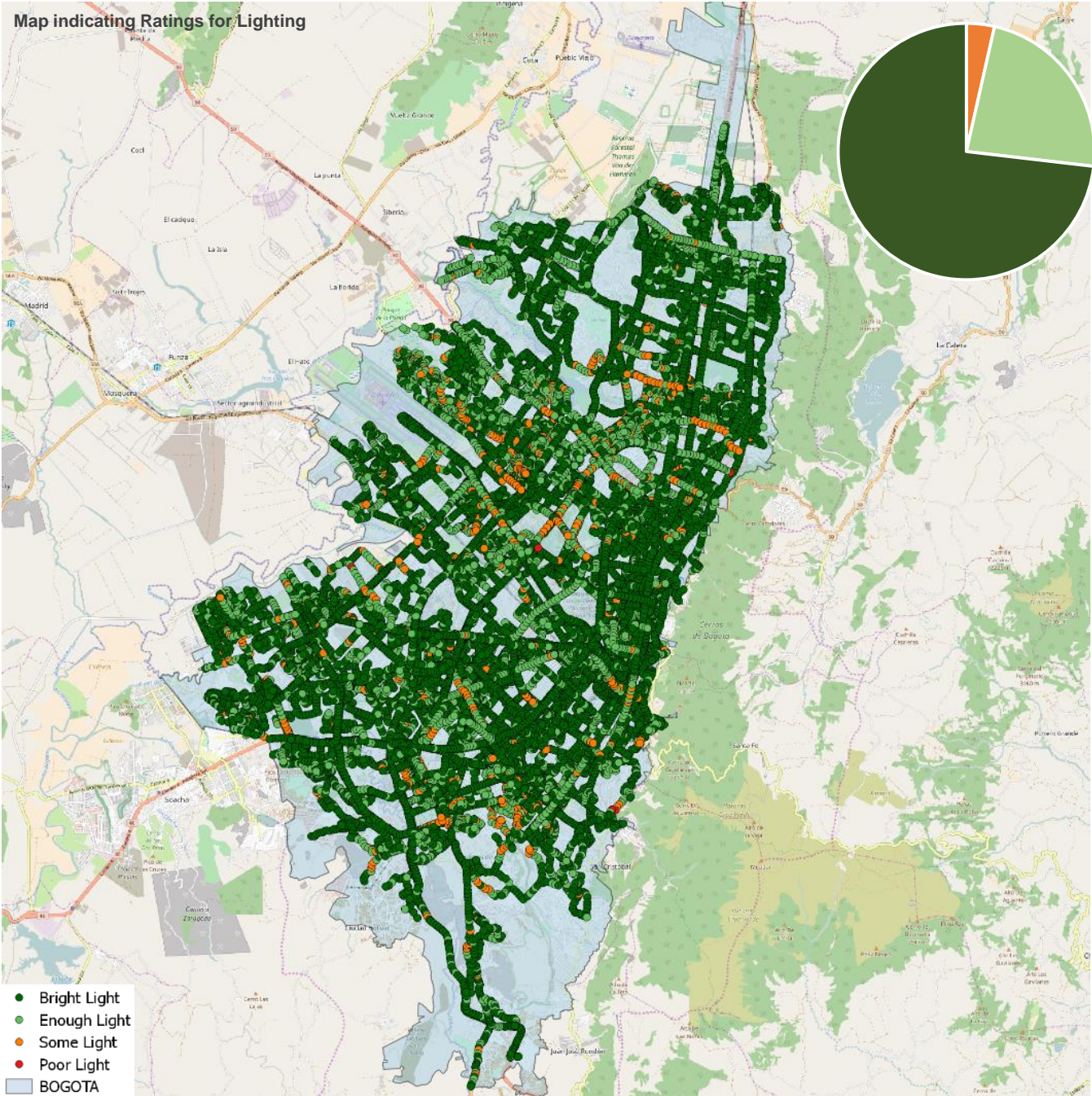
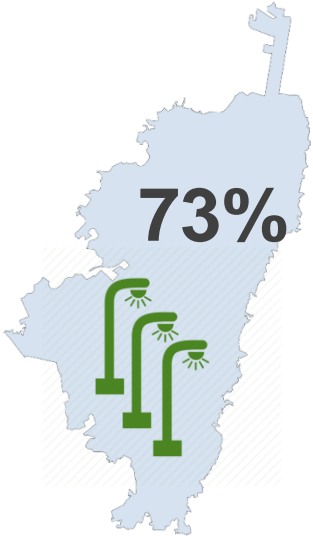


Percentage Distribution of Safety Score



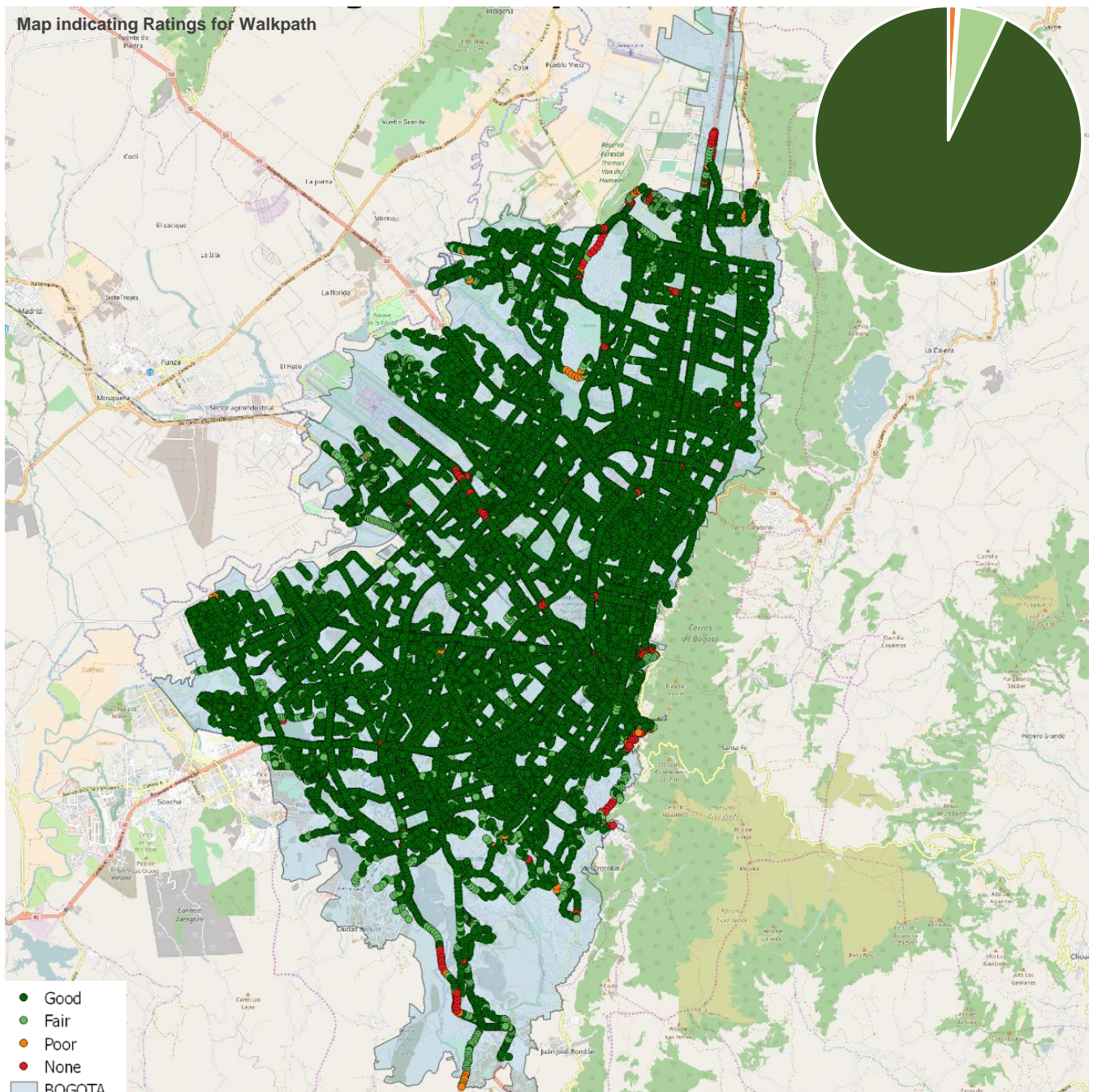
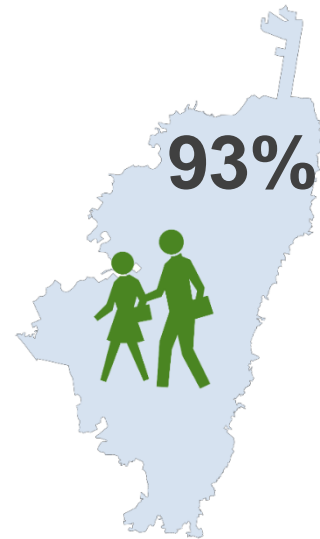
Lighting

The Lighting parameter has been rated 2.7/3 i.e. Good. 73% of the audit area was found to be brightly lit while another 23% was adequately lit. 4% of the audit points had inadequate illumination. Most of the city is adequately lit but at some points streetlights were found to be non-functional at the time of audits.



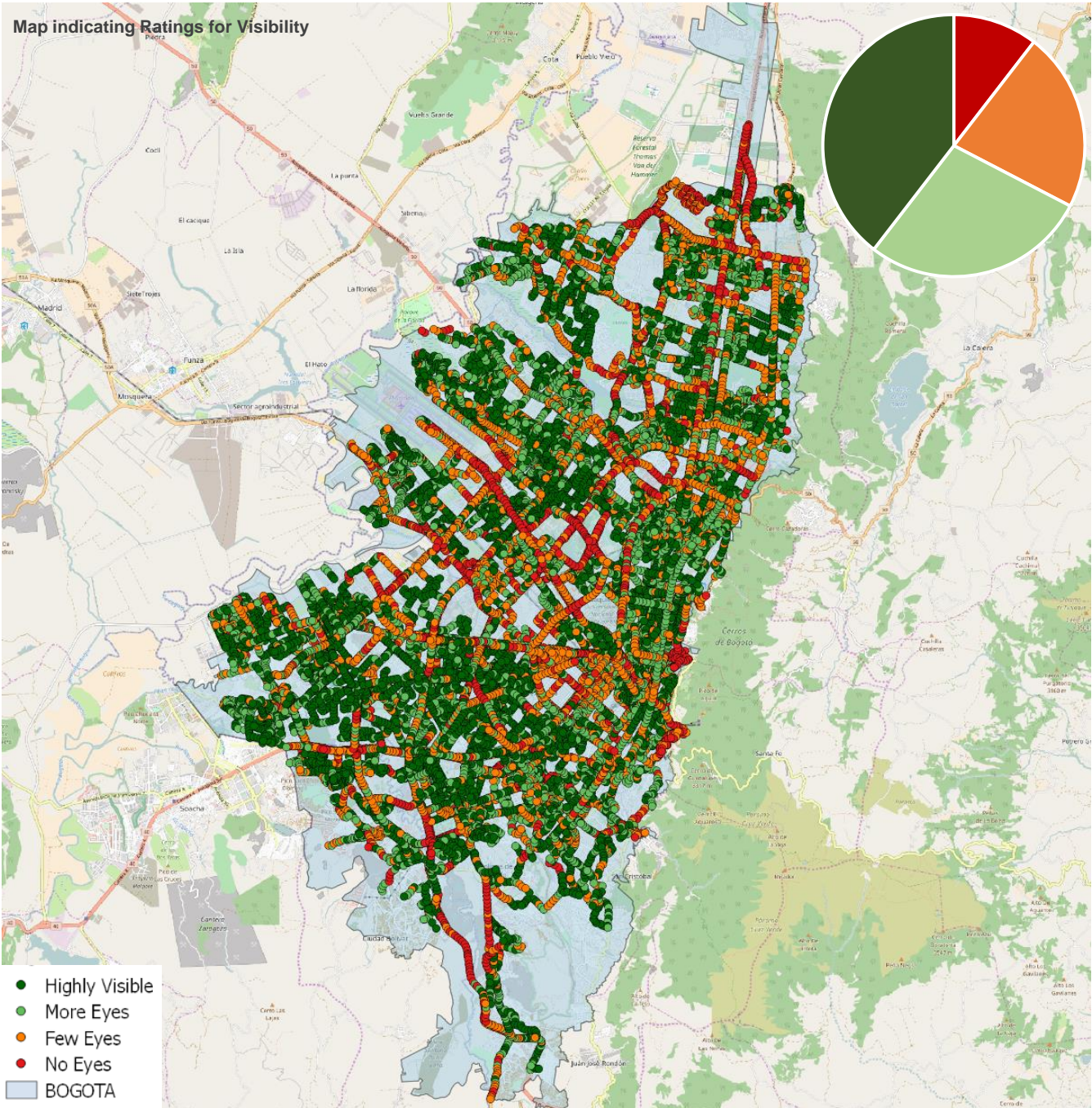
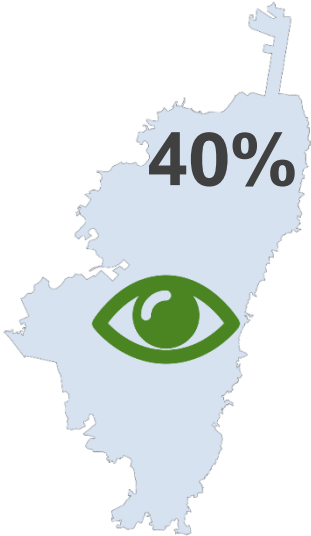
Walkpath

Walkpath Parameter has been rated 2.9/3 i.e. Good. Footpath exists throughout the city and is mostly in good condition. This is clearly shown in the map with 93% of the audit points are rated good in terms of walkpath. Only 1% of audit points were rated poor. At these points, footpath was found to be broken and damaged in parts.



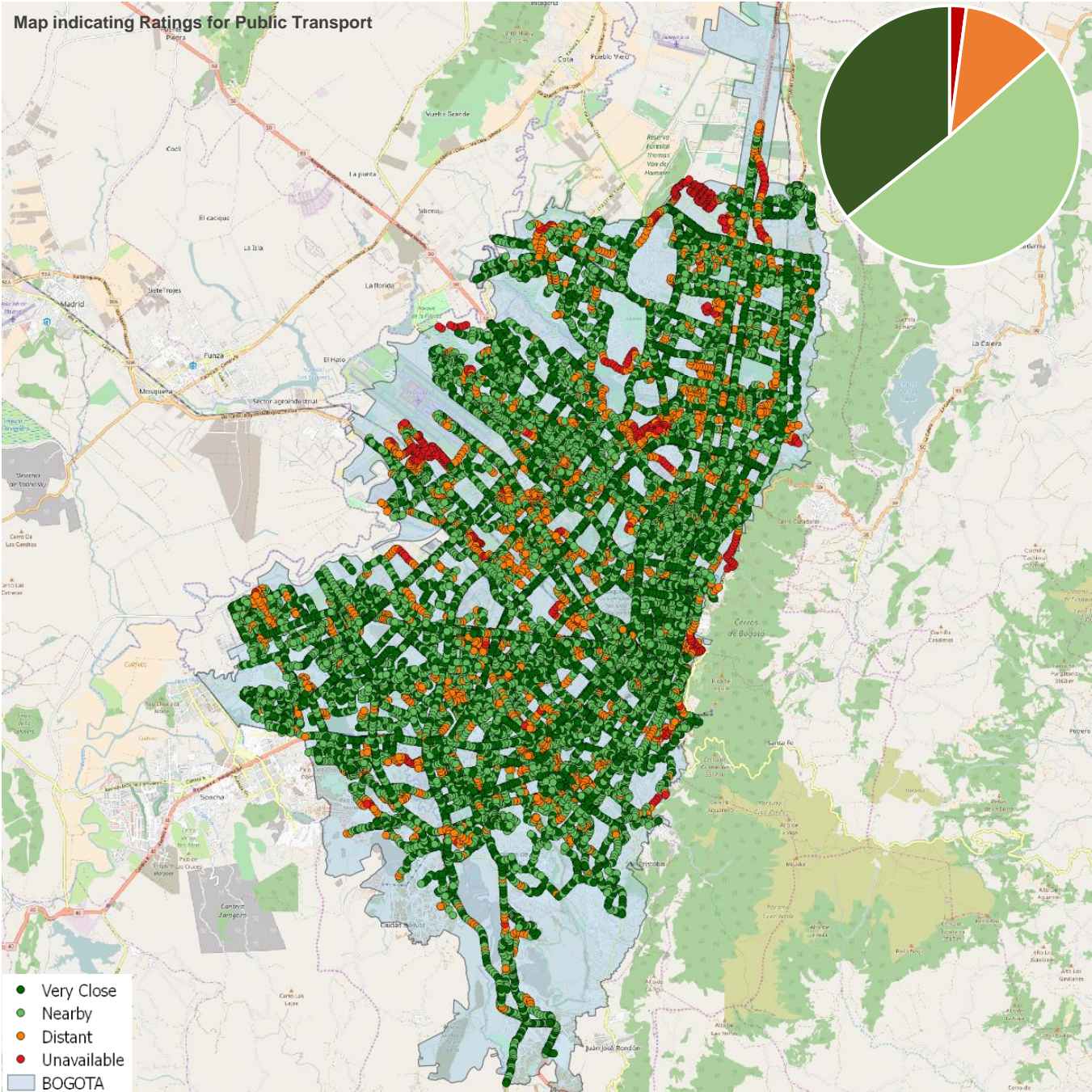
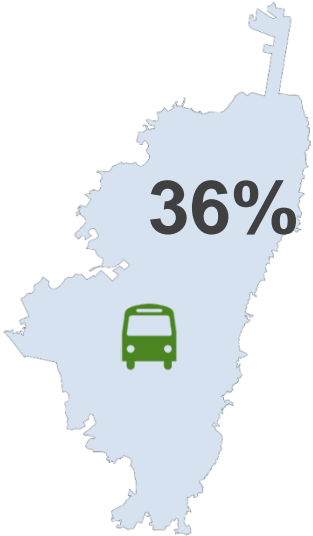
Visibility

Visibility Parameter has been rated 2.0/3 i.e. Above Average. 40% of the audit points were found to have high visibility and 32% audit locations have no or few 'eyes on the street'. Besides permanent establishments, road side vendors and temporary stalls also contribute to natural surveillance on the streets.



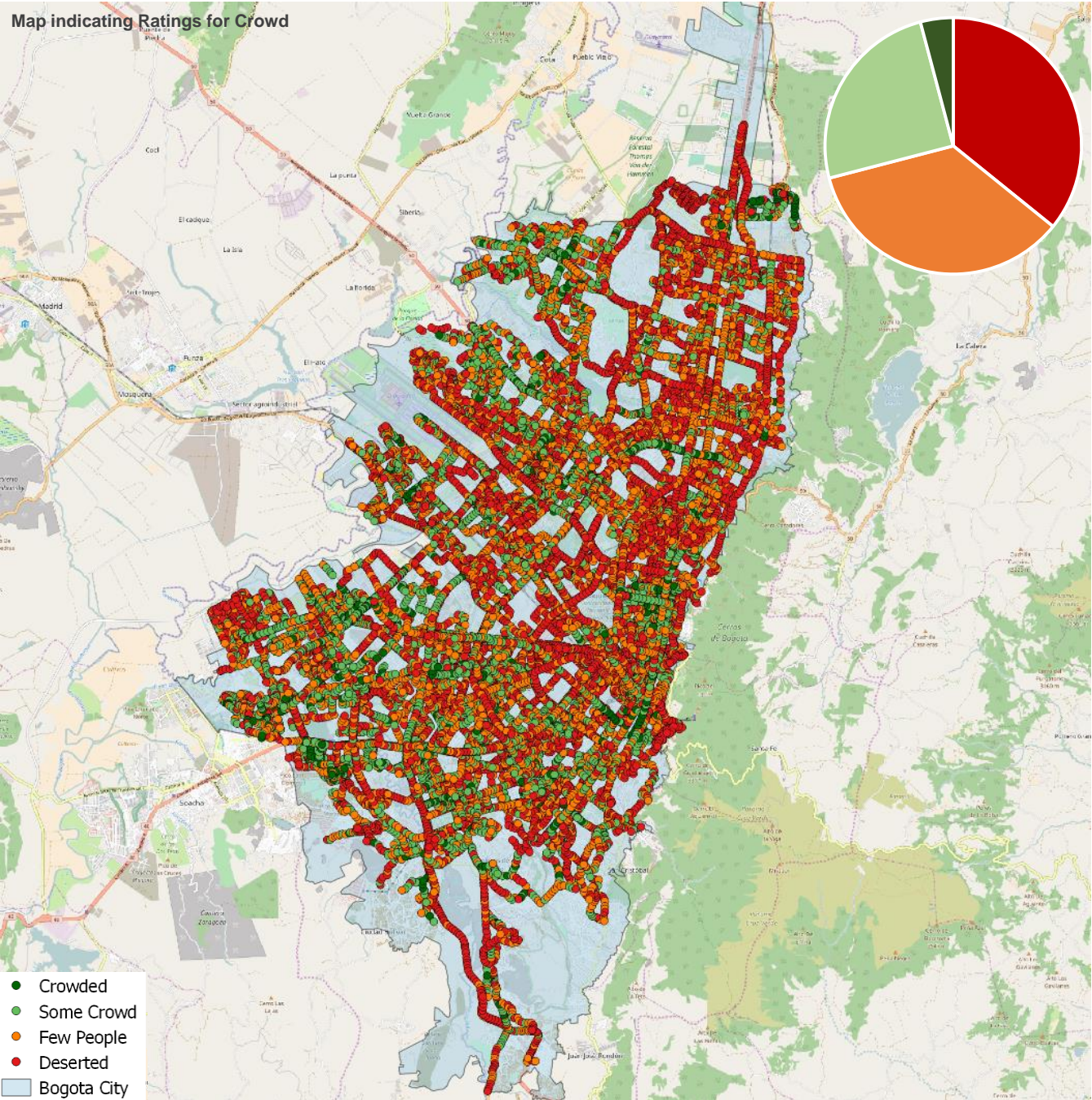
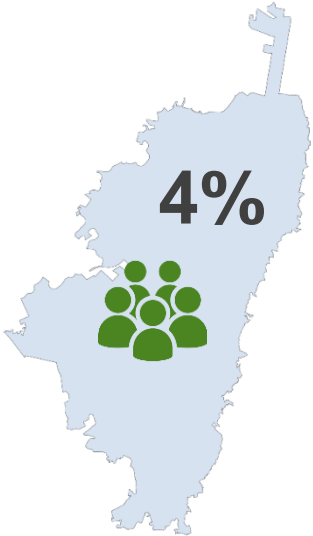
Public Transport

Public Transport Parameter has been rated 2.2/3 i.e. Above Average. 51% of the city has accessible public transport i.e. within five mins walk. Only 2% of the audit points have no means of public transport within 400m radius. To improve last mile connectivity throughout the city, Bogota city government has laid down a wide network of cycle routes, called 'Ciclorutas'.



Crowd

Crowd Parameter has been rated 1.0/3 i.e. Below Average. 36% of the city area was found to be deserted after dark. Also, over 80% of the city has been rated as Not Diverse in terms of Gender Usage. However as mentioned earlier, Crowd and Gender Usage are derived parameters i.e. improving the other parameters will result in a location being safer and hence more people, especially women would start using it at night.



NAIROBI

Nairobi also known as the “green city in the sun” is Kenya’s capital city. It is Kenya’s largest city with a population of nearly four million. The city occupies approximately 684 sq.km (425 square miles) of area and is today a growing commercial and economic centre of the country.

With a rich ethnic diversity, the city enjoys the status of a full administrative county. In 2013, Nairobi City Council became Nairobi City County which elected its first governor in March 2017. According to the 2017 ratings, the city is ranked as the fastest changing city in Africa and is ranked 10th in the world, beating big cities such as Dubai, New York, Paris, and Stockholm.



Analysis & Findings

Nairobi has been given a Safety Score of 3.1 on 5 based on the safety audits collected. A total of 11,807 safety audits have been collected. Of these 4,956 audits were conducted by app users and 6,851 were generated using the Safetipin Nite app covering 685 kilometers of road length.

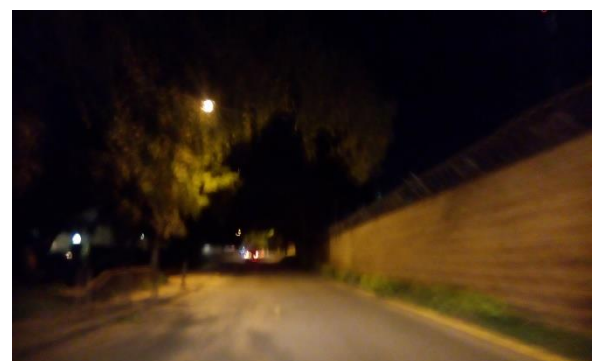
Audits indicate that 43% of the area audited has a Safety Score of 4.0 or above. 8% of the audit locations have been given a Safety Score of less than 1.0. Another 14% of the audit points have a Safety Score ranging between 1.0 to 1.9 and 17% have a score from 2.0 to 2.9. 18% of the audit pins have a Safety Score from 3.0 to 3.9.

Of the nine parameters, Security ,Gender Usage , Crowd and Visibility have been given a Below Average rating. Lighting , Walkpath and Public Transport have been rated Average. Openness has been rated Above Average.

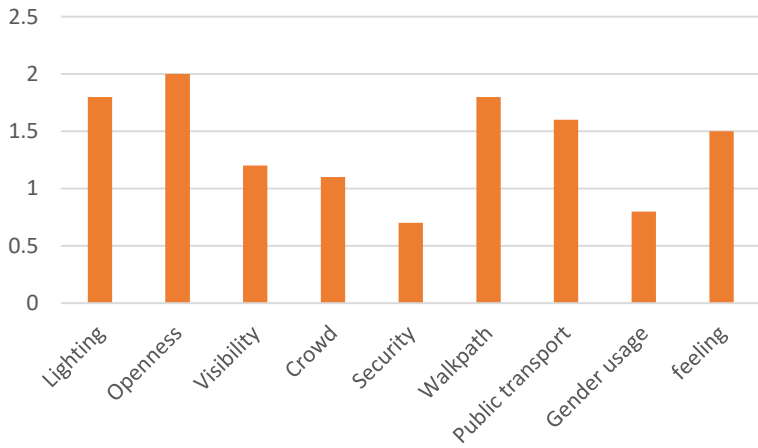
The safety rating varies largely on account of the infrastructure provision as well as social usage of the space. Despite its positive geographical features, Nairobi has a fair share of problems like congested roads and streets, crime and poverty. There is immediate need to focus on improving infrastructure and security to ensure a safe and resilient city. The Feeling parameter is directly impacted by the other eight parameters. Lighting, Walkpath, Public Transport and Visibility are infrastructural parameters and can be improved upon. Improving the condition of these parameters would result in more people especially women using public places at night.

Data analysis indicates that the parameter of Lighting has the maximum impact on the perception of safety followed by Visibility , Security and Walkpath. Also, each parameter has a different impact potential on the overall perception of safety. Improving the parameter with greater impact potential would result in a higher increase of the Safety Score.

Lighting has the maximum impact on the perception of safety followed by Visibility, Security and Walkpath.



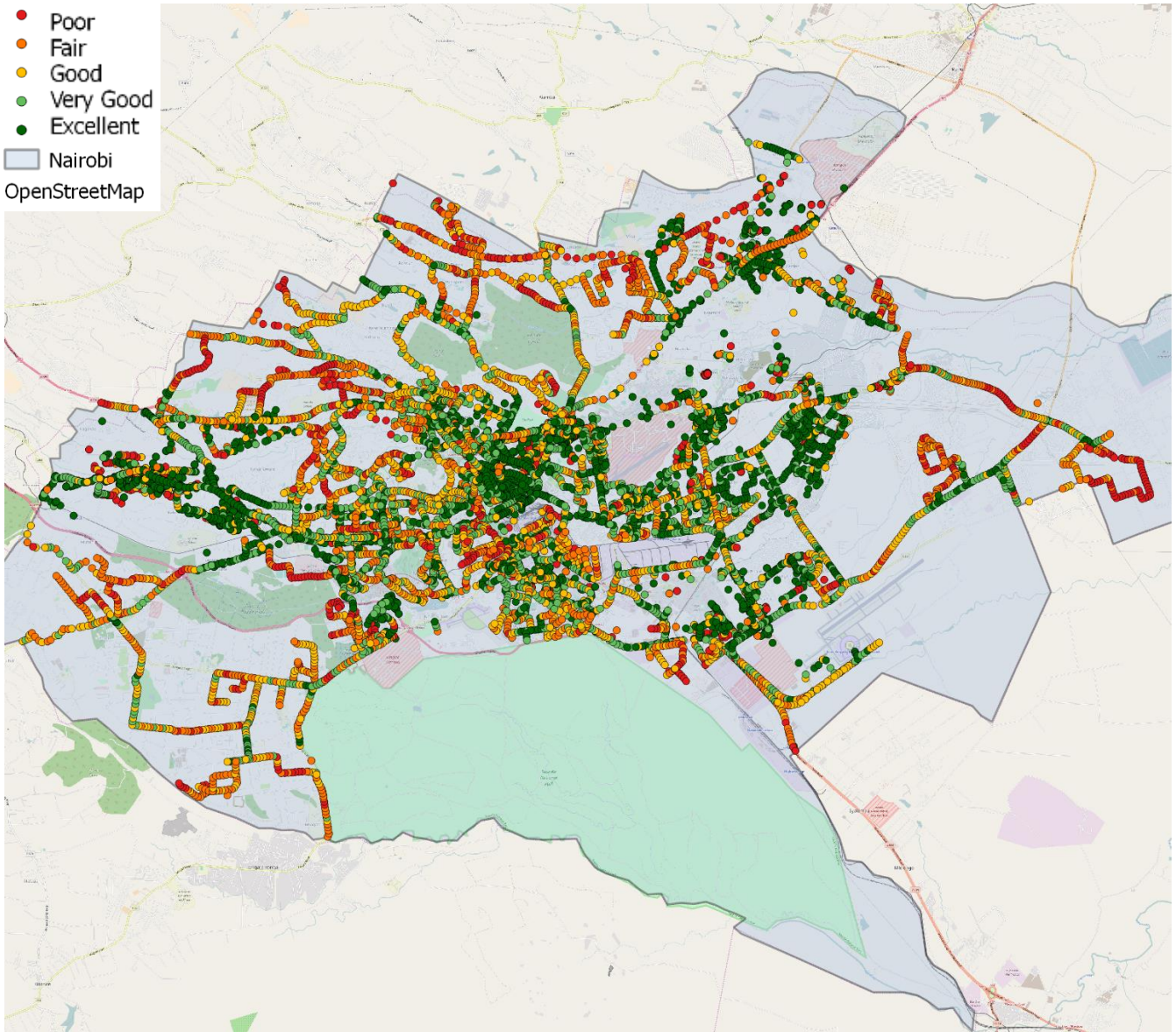
Average Parameter Ratings



Percentage Distribution of Safety Score

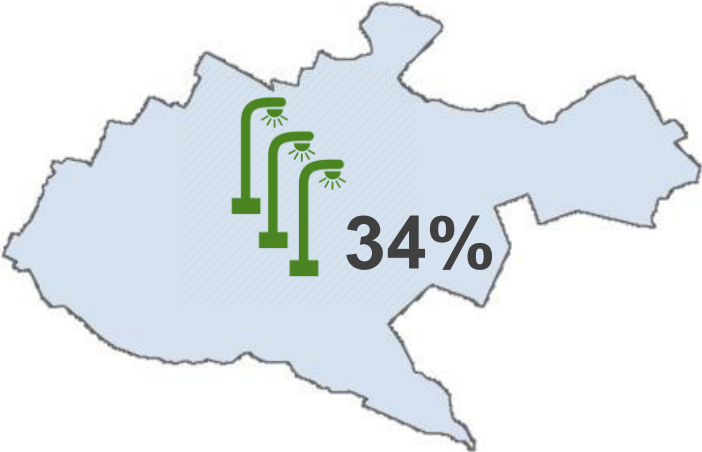


Map indicating Safety Score Ratings



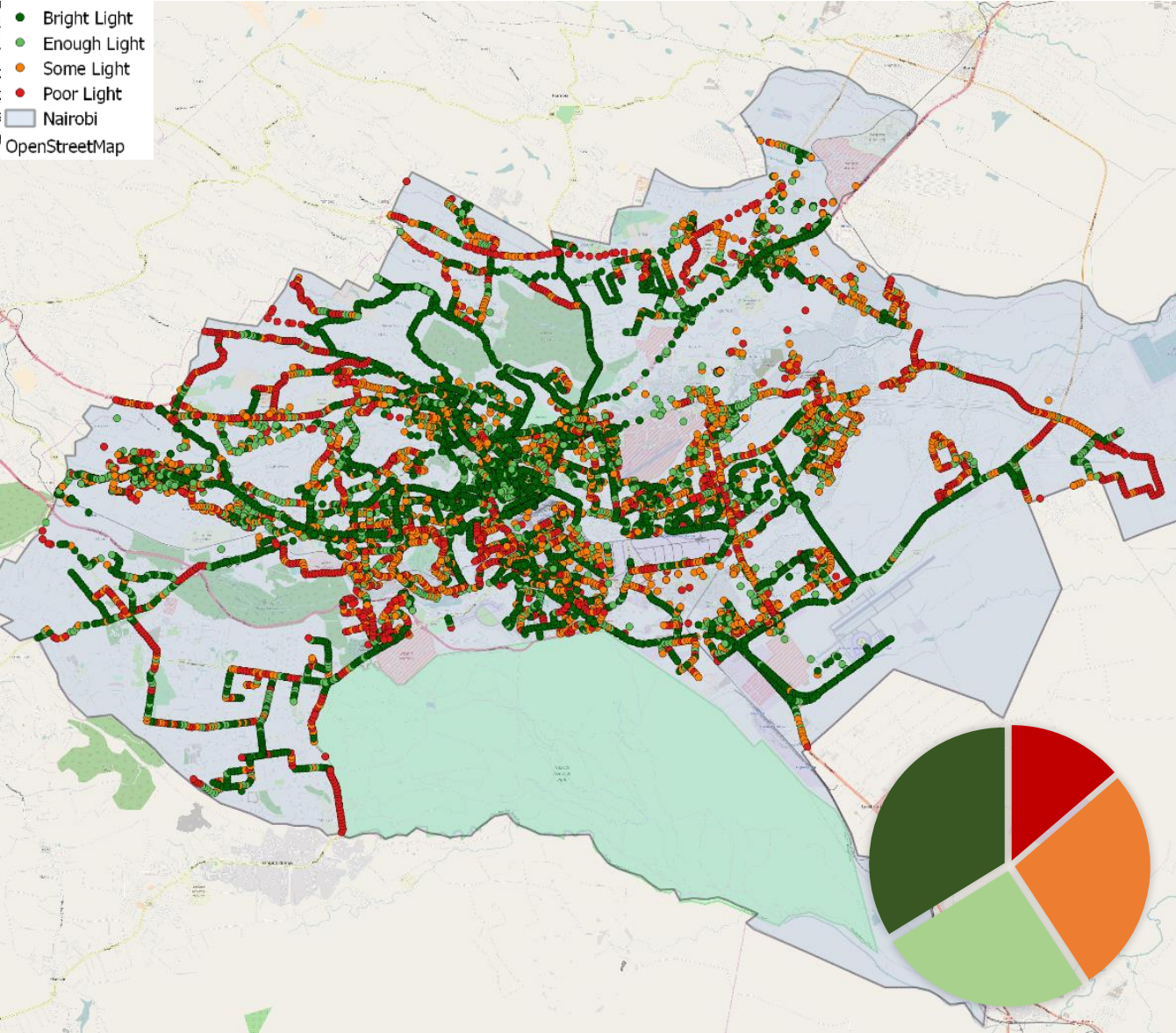
Lighting

The Lighting parameter has been rated 1.8 /3 i.e. Average . 34% of the audit area was found to be brightly lit while another 25% was adequately lit. 27% of the audit points had inadequate illumination and 14% of the audit area had poor lighting. Some audit points were found to have poor lighting due to streetlights being inoperative or hidden behind trees' leaves. At few points there were no streetlights.



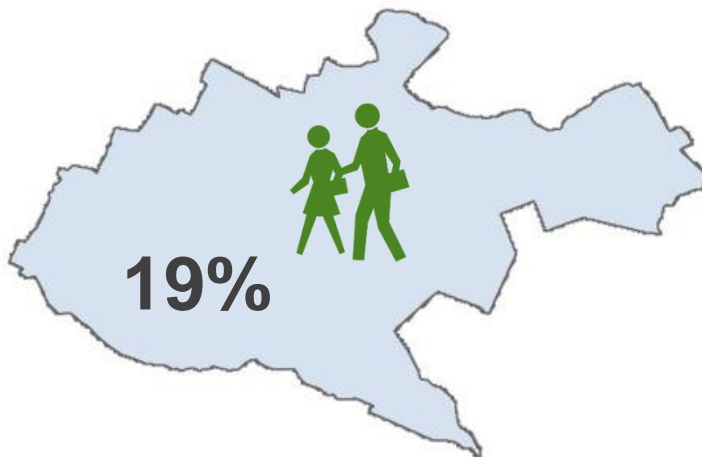
Map indicating ratings for Lighting

- Bright Light
- Enough Light
- Some Light
- Poor Light
- Nairobi
- OpenStreetMap

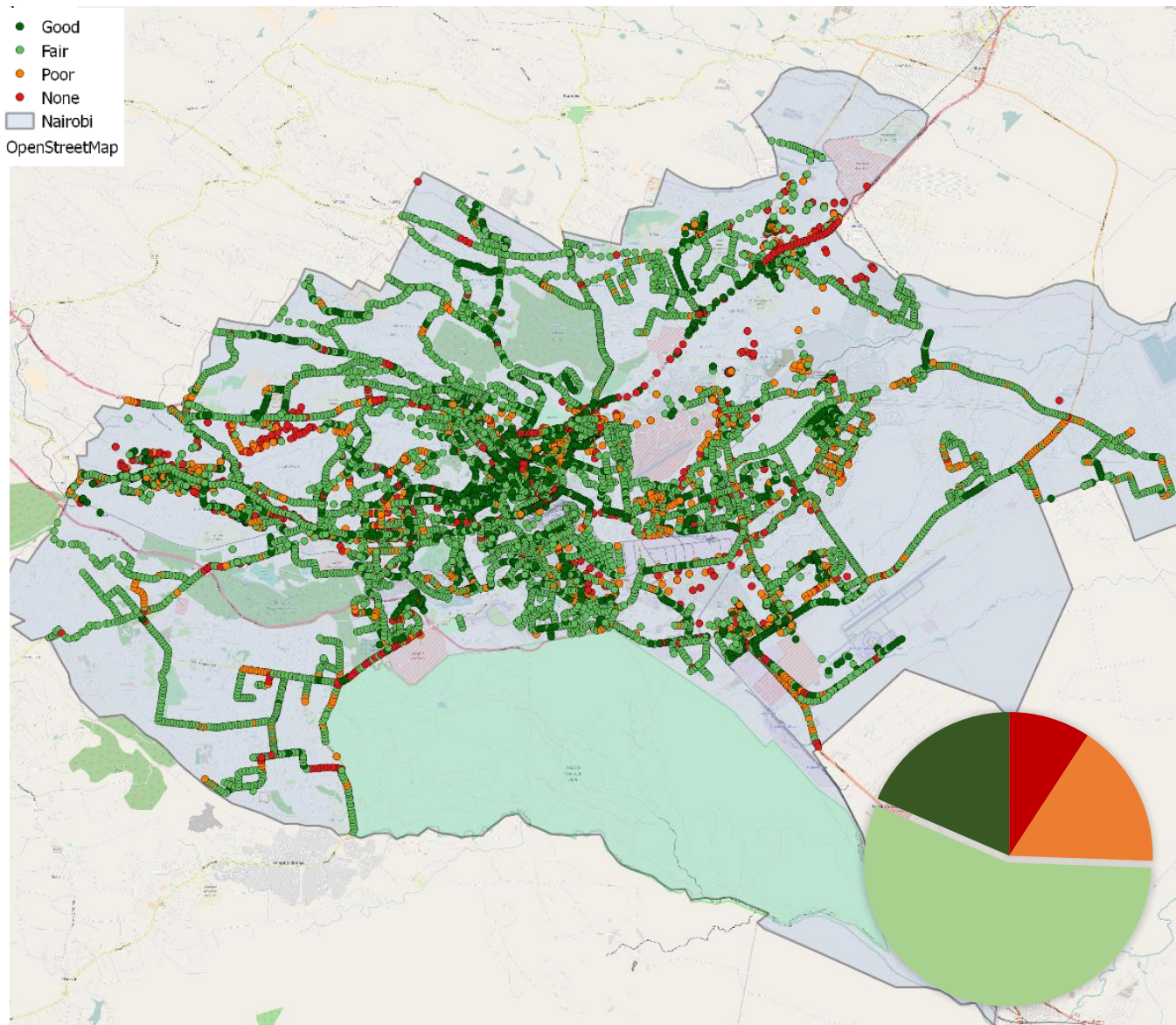


Walkpath

Walkpath Parameter has been rated 1.8/3 i.e. Average. While 19% of the audit area was found to have walkpath in good condition, 56% is in fair condition i.e. can walk but not suitable for running. 9% of the audit area has no Walkpath. Another 16% of the audit points have walkpath but it's in poor condition. At these audit points, unpaved or broken pavement exists. Some are obstructed by cars, thus disrupting pedestrians' movement.

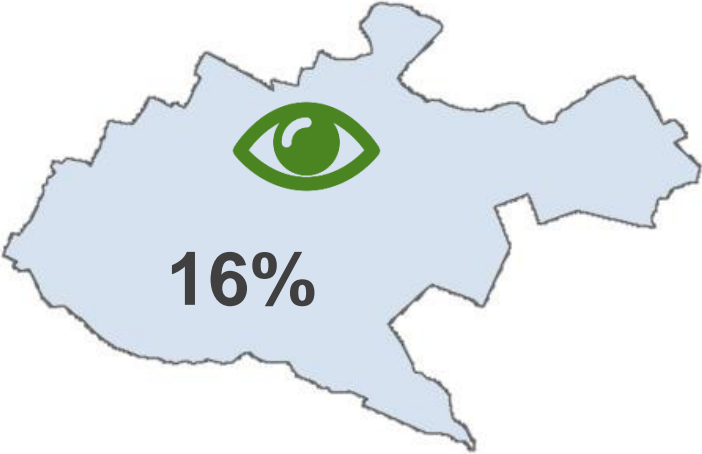


Map indicating Ratings for Walkpath



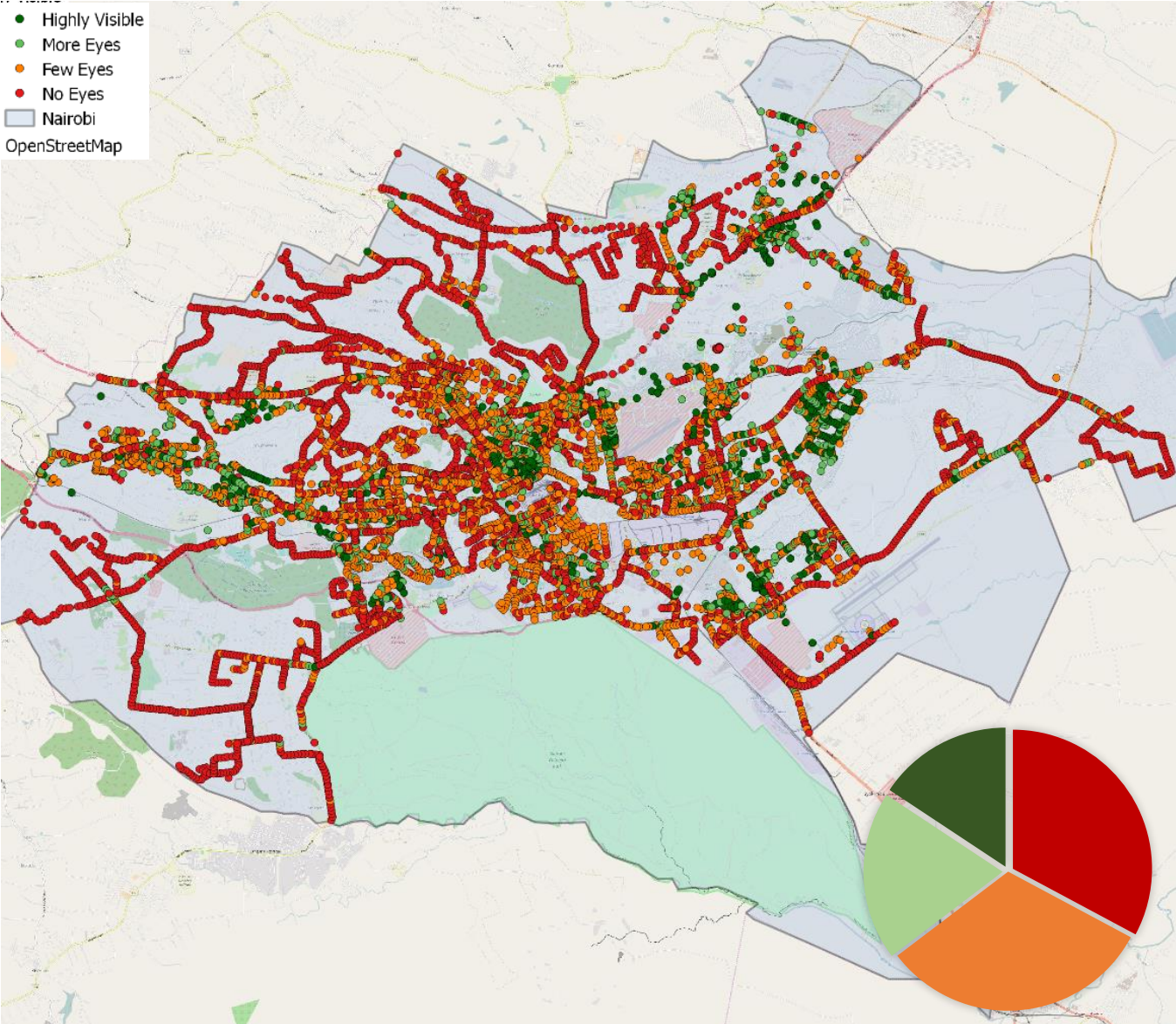
Visibility

Visibility Parameter has been rated 1.2 /3 i.e. Below Average. 16% of the audit points were found to have high visibility and 33% audit locations have no or few 'eyes on the street'. With boundary walls creating a physical division between the pedestrians and the residents behind the walls, the visibility is rated poor.



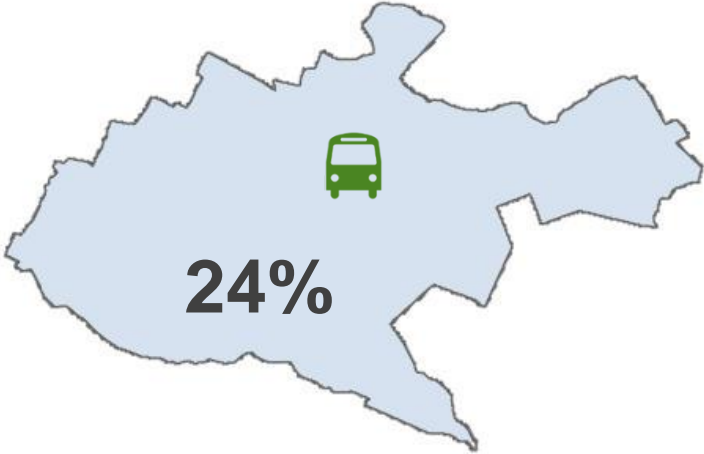
Map indicating Ratings for Visibility

- Highly Visible
- More Eyes
- Few Eyes
- No Eyes
- Nairobi
- OpenStreetMap



Public Transport

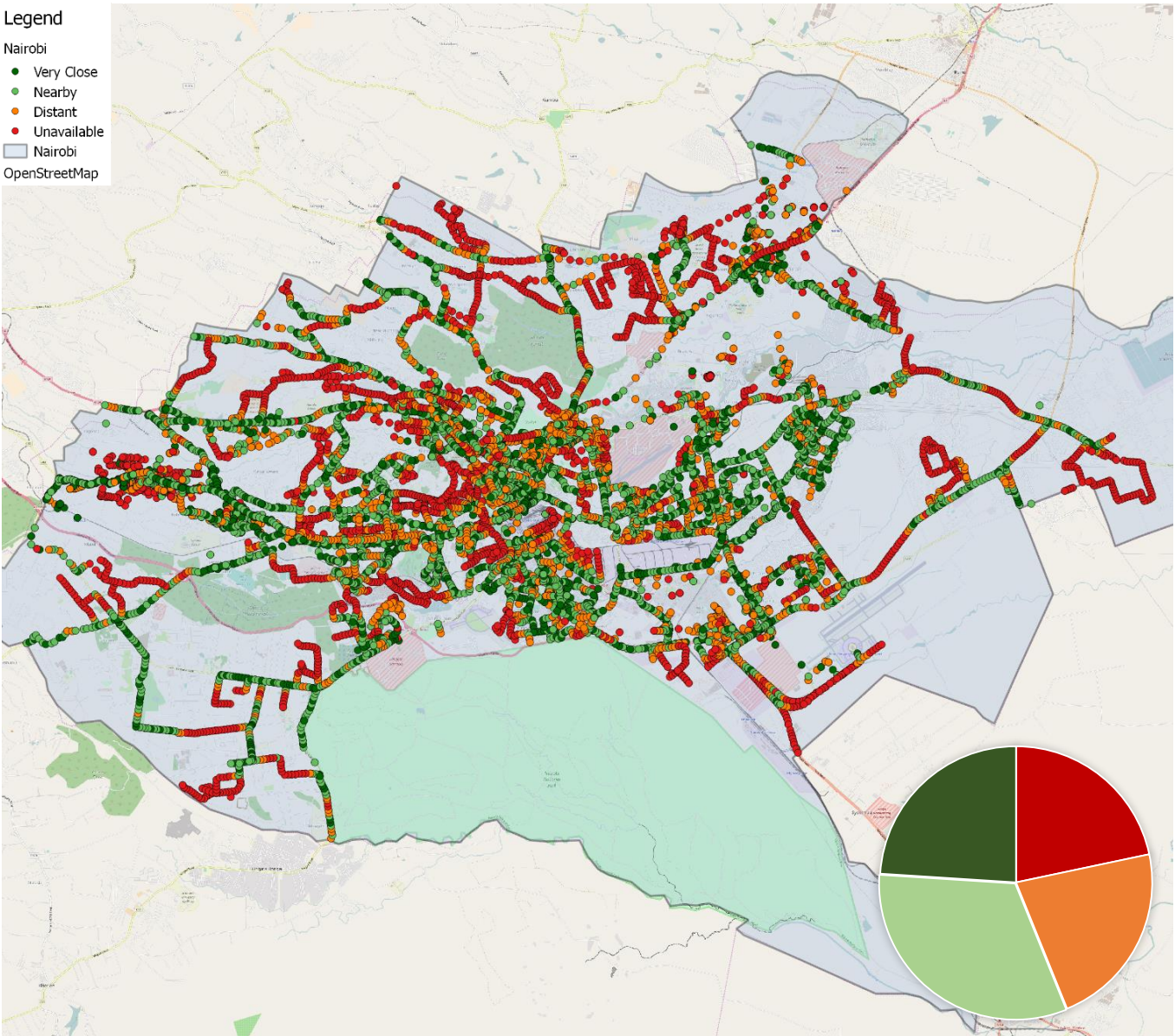
Public Transport parameter has been rated 1.6/3 i.e. Average. 24% of the city has accessible public transport within 5-min walk whereas 22% of the audit points have no means of public transport within 10 min walk or 400m radius.



Map indicating Ratings for Public Transport

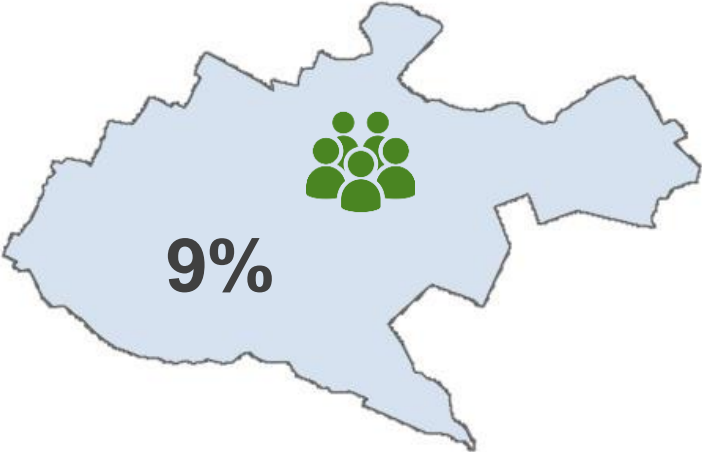
Legend

- Nairobi
- Very Close
- Nearby
- Distant
- Unavailable
- Nairobi
- OpenStreetMap

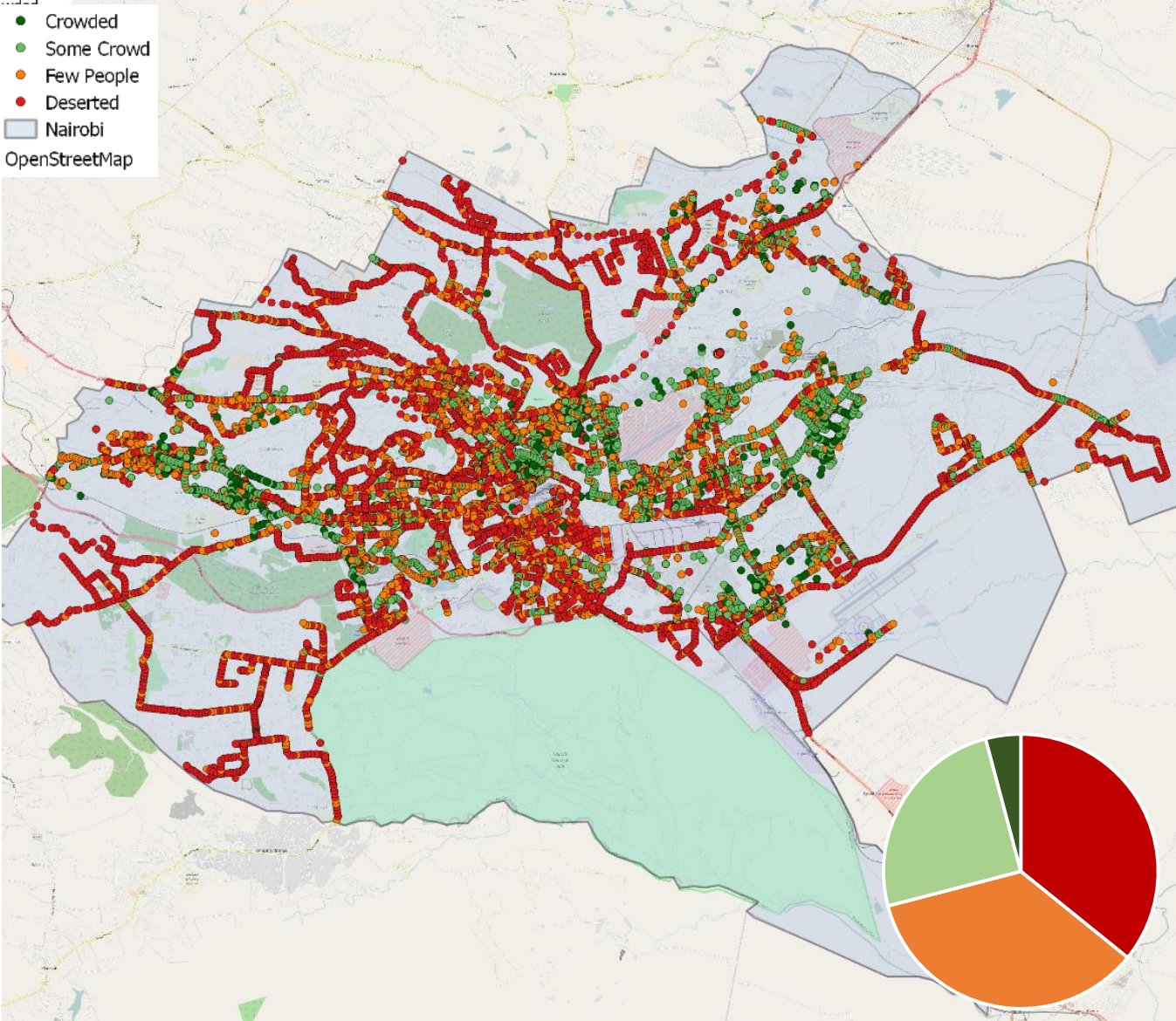


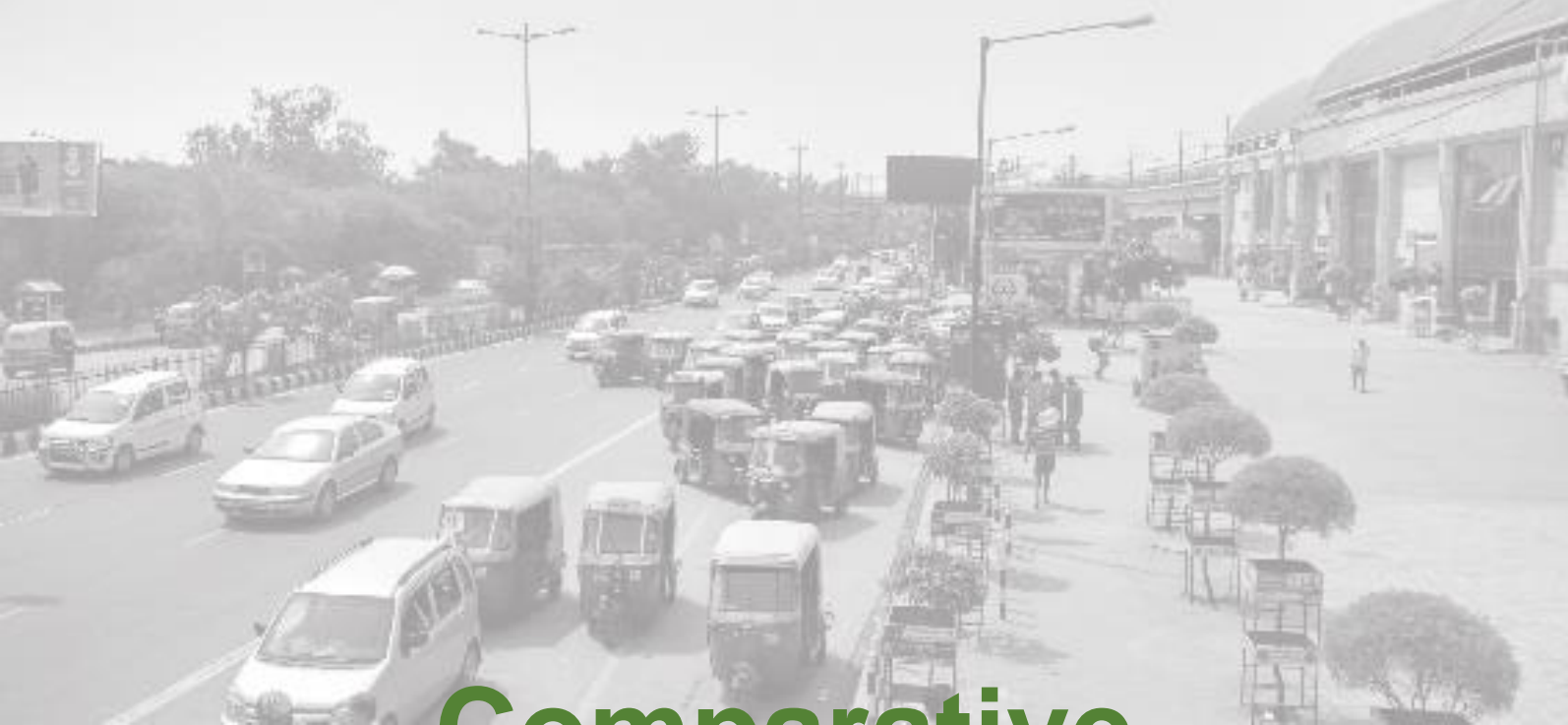
Crowd

Crowd Parameter has been rated 1.1/3 i.e. Below Average. 34% of the city area was found to be deserted after dark. Only 9% of the audit points have significant number of people after dark. Also, in terms of Gender Usage, 59% of audit points were found to be Not Diverse.



Map indicating Ratings for Crowd





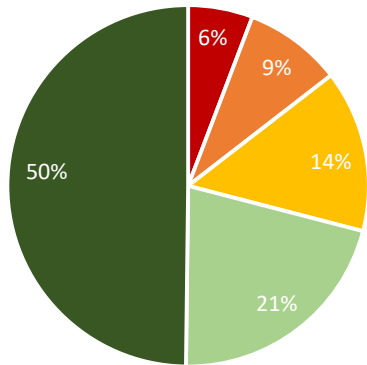
Comparative Analysis



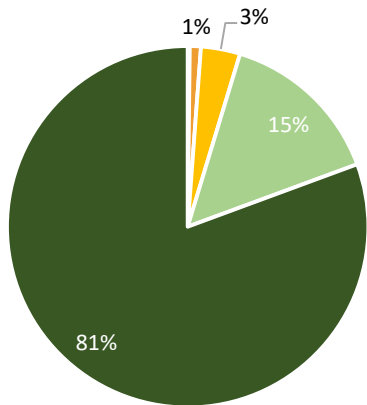
Comparative Analysis

Safety Score

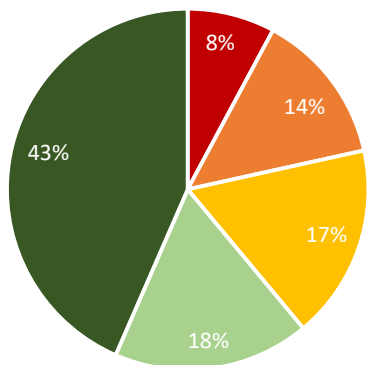
■ Poor ■ Below Average ■ Average ■ Good ■ Excellent



Delhi



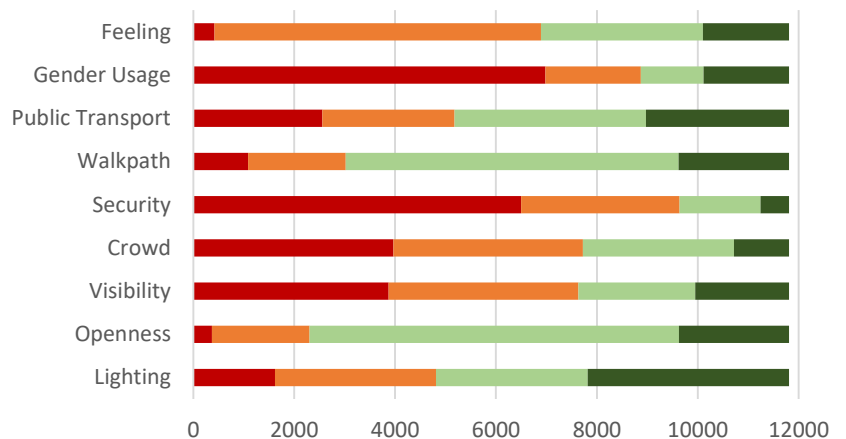
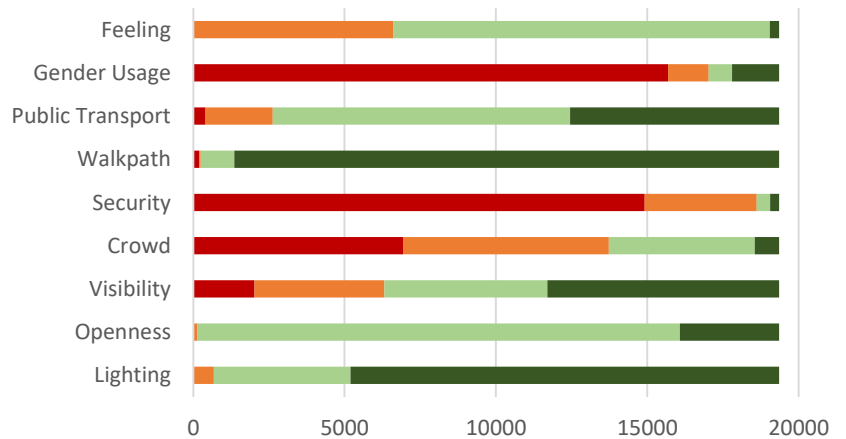
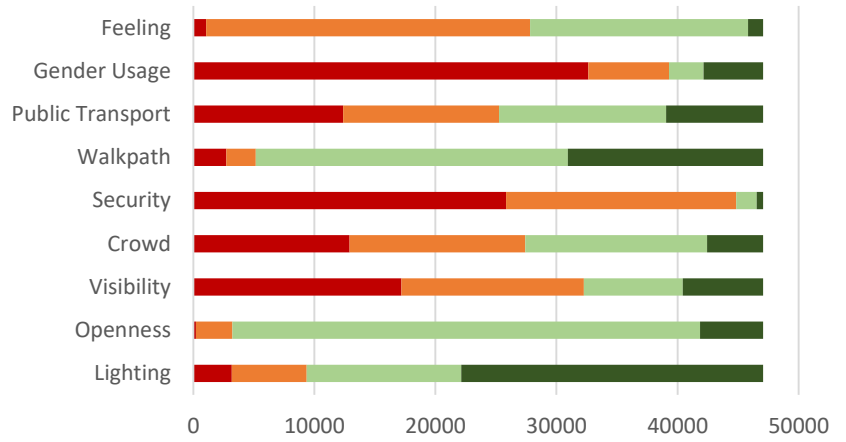
Bogota



Nairobi

Parameter Rating

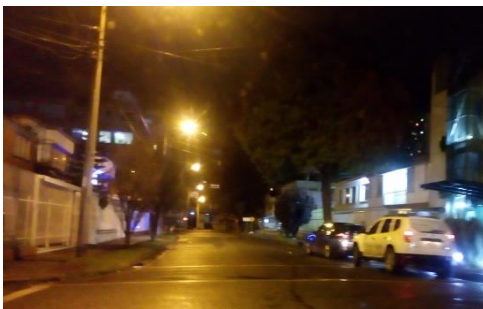
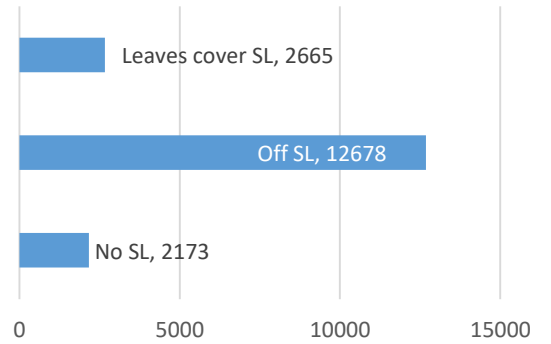
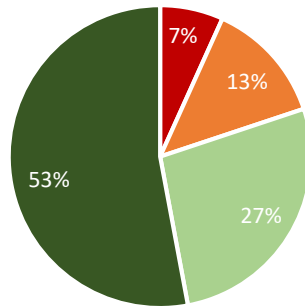
■ Poor ■ Below Average ■ Fair ■ Good



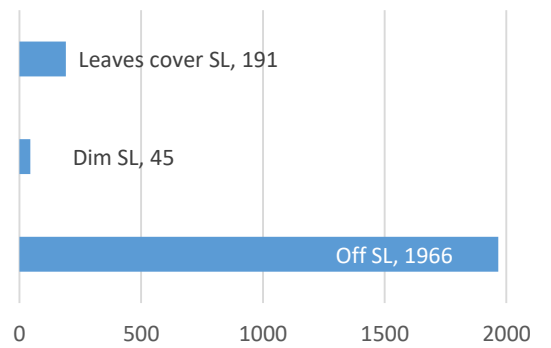
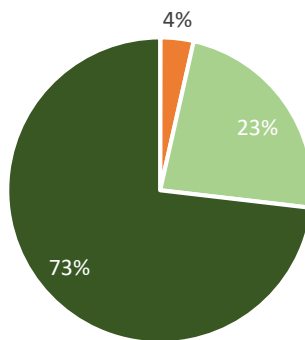
Lighting



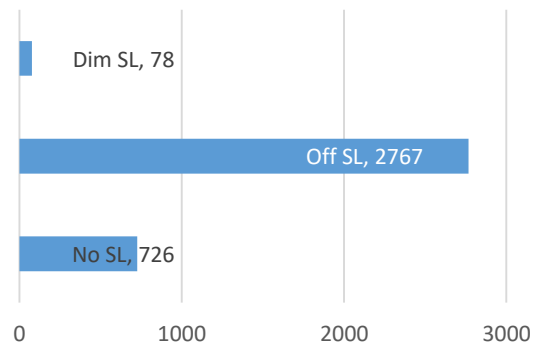
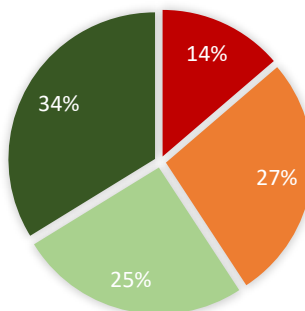
Delhi



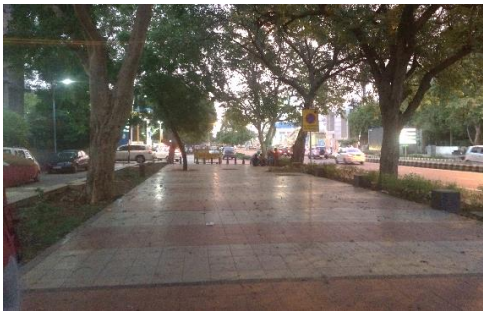
Bogota



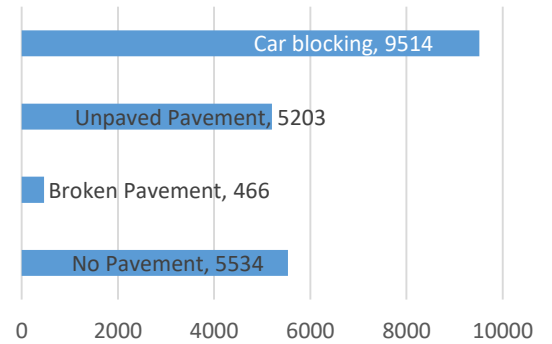
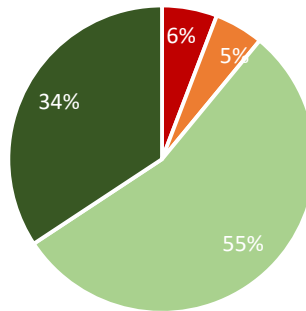
Nairobi



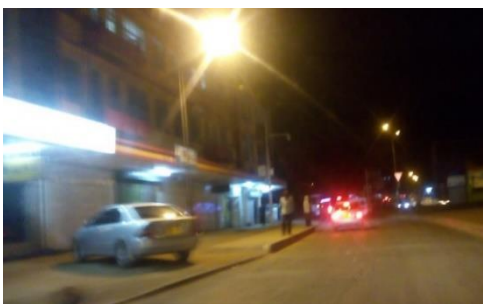
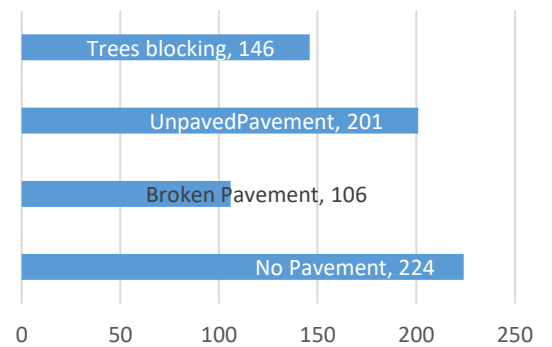
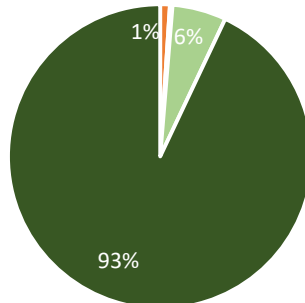
Walkpath



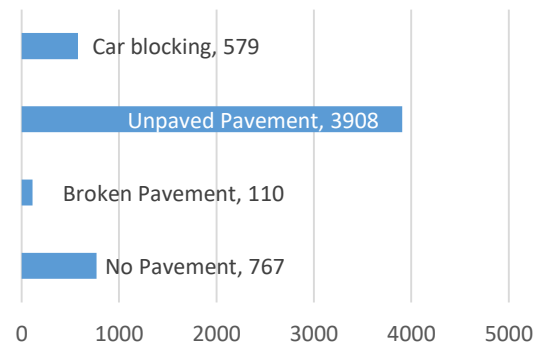
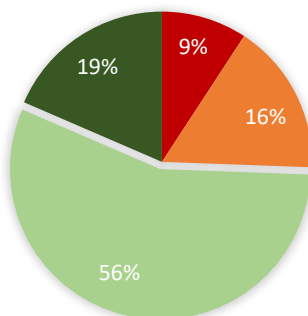
Delhi



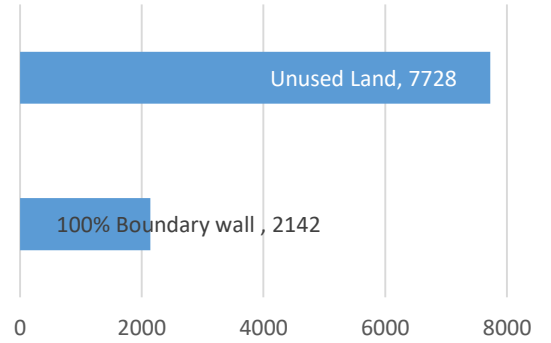
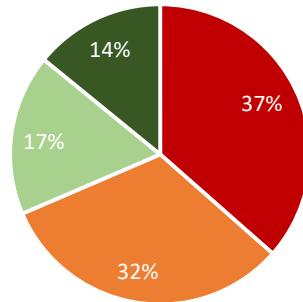
Bogota



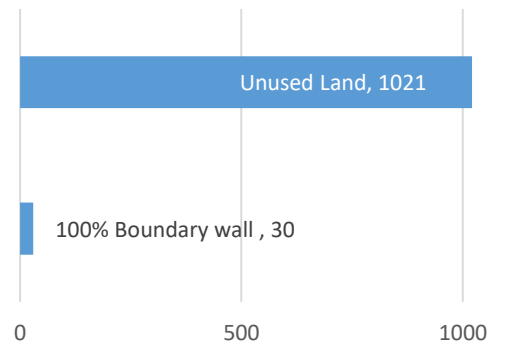
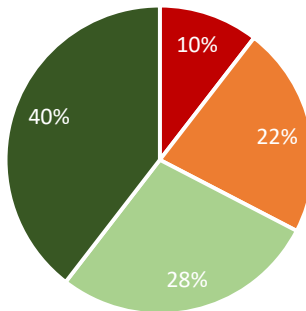
Nairobi



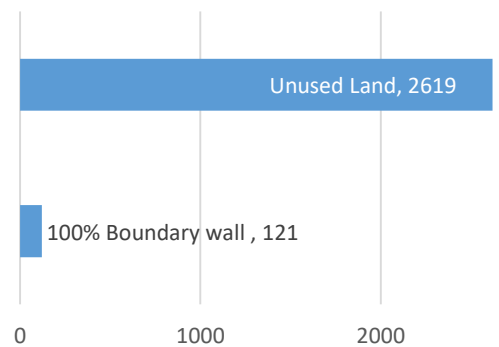
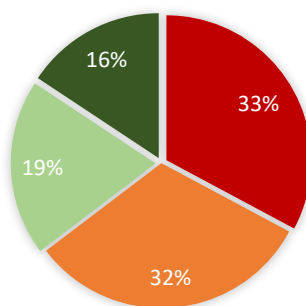
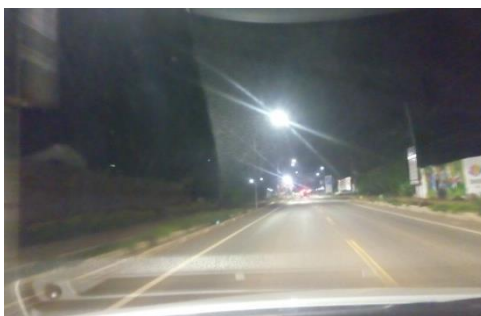
Visibility



Delhi



Bogota

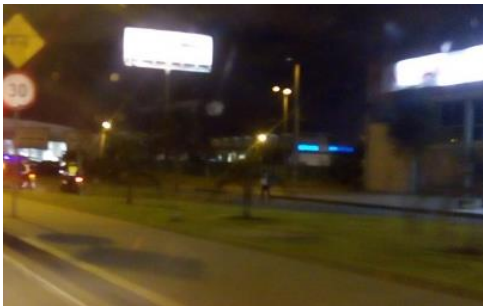
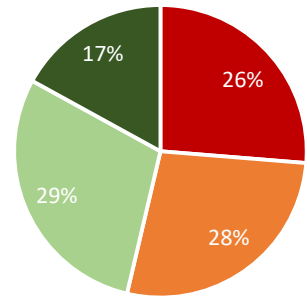
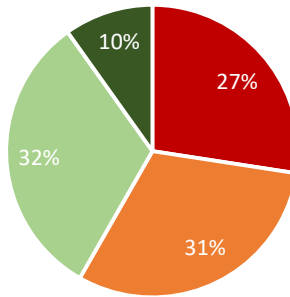


Nairobi

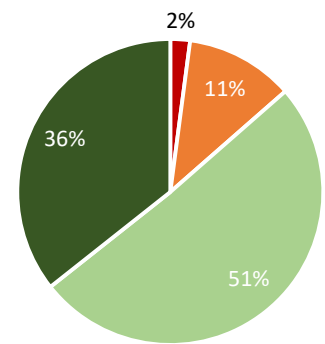
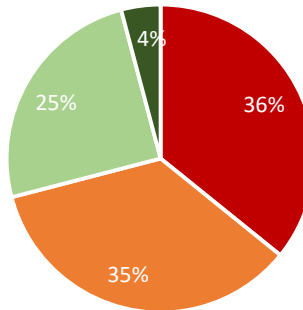
Crowd and Public Transport



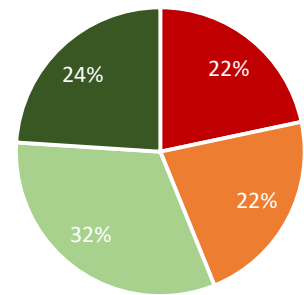
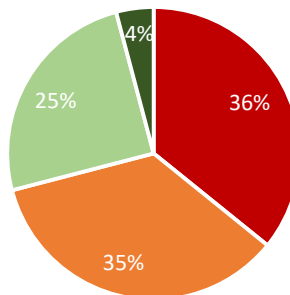
Delhi



Bogota



Nairobi



Crowd

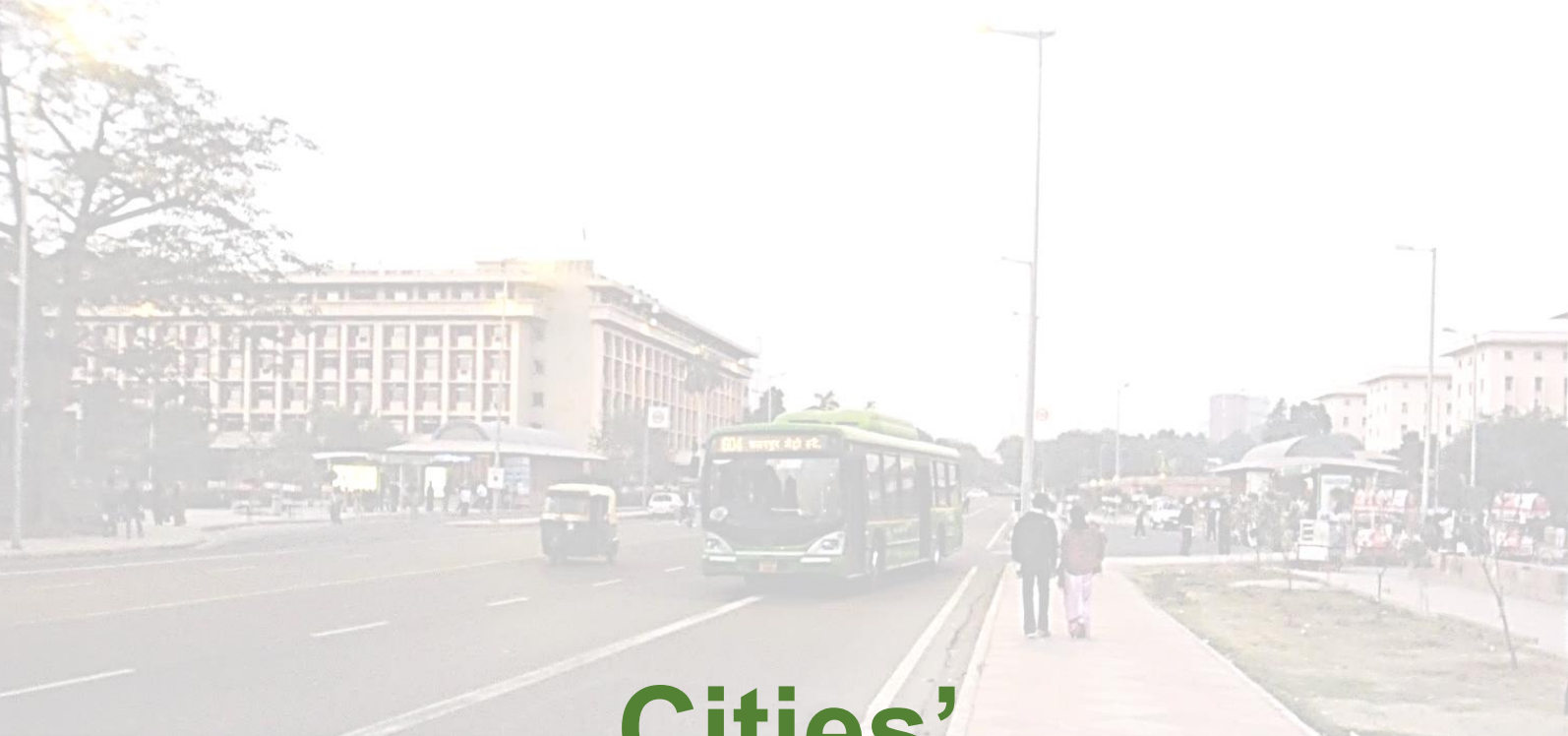
Public Transport

Recommendations

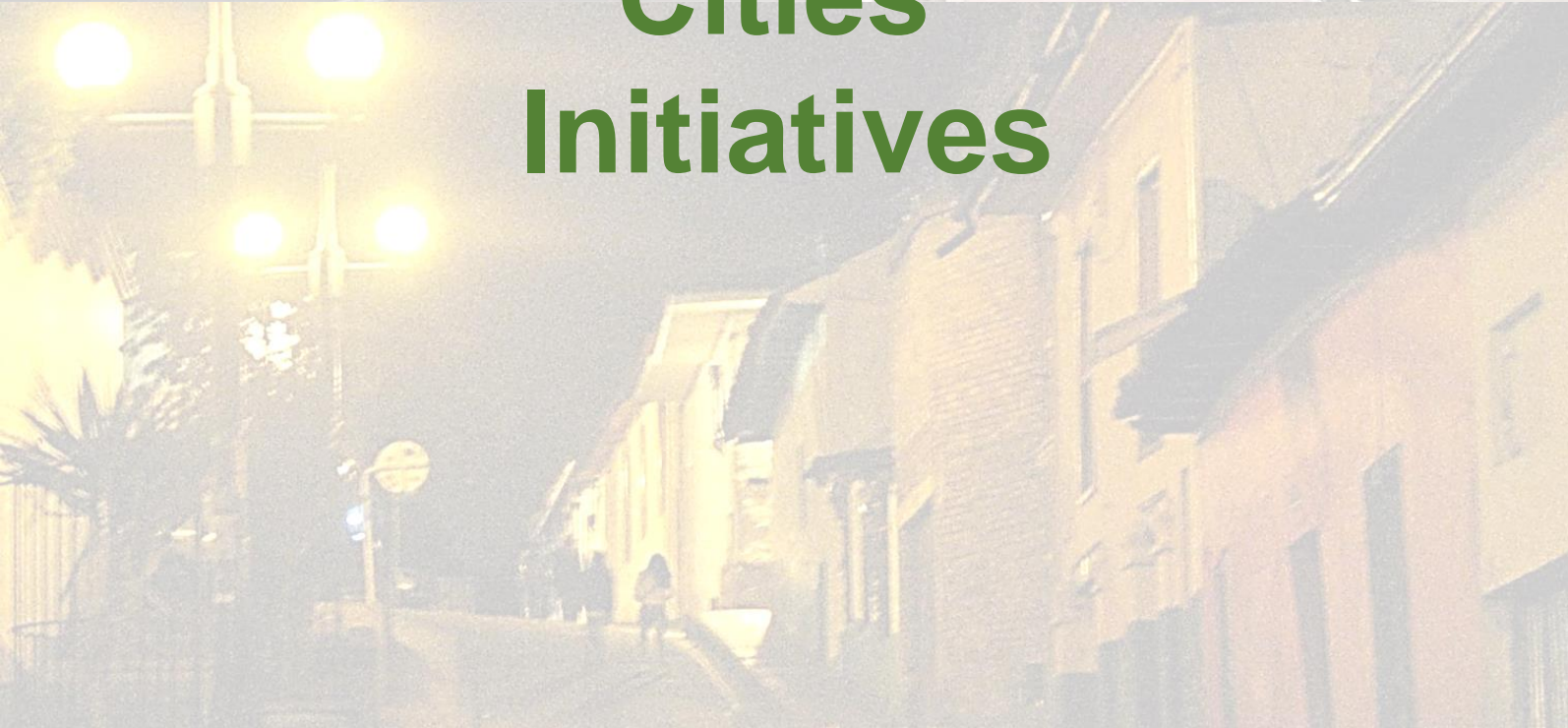
The safety ratings varies largely on account of the infrastructure provision and planning typology of the area. Areas which are well lit, have proper footpaths, has access to public transportation and are active, tend to be safer. Lighting, Walkpath, Security, Public Transportation and Visibility are infrastructural parameters and can be improved upon. This improvisation would result in more people especially women using public places at night.

Recommendations

- Enhance Illumination along Walkpath – The existing streetlights found un-operational need to be energized. Also regular checks are necessary to ensure that all streetlights are operational at all times. Many streetlights were found to be hidden behind tree leaves. Regular pruning of leaves is needed. Streetlights need to be installed along areas identified as dark spots i.e. at these locations there is no or poor illumination at present. Also along the main roads having four lanes or more, streetlights are provided only on one side or along the central median of the road. Along such stretches streetlights need to be installed along the footpath. Pedestrian scale streetlights should be installed focused towards the walkpath and not the vehicular carriageway.
- Construct Pavement and Repair existing ones – At certain locations the pavement was found to be broken. This damage needs to be repaired and a proper paved surface needs to be created. Along certain roads either no footpath exists or space has been left for one but it hasn't been constructed. A proper footpath needs to be constructed free from any obstruction. Street furniture etc. should be provided clear of the footpath. Also provision should be made to ensure smooth movement of people with any form of disability.
- Improve Security – Many areas do not have any form of security – private guards or Police. Regular police patrolling needs to be ensured in all areas.
- Improve Visibility – many roads have their edge defined by a high boundary wall. This results in poor visibility of the pedestrian making one feel unsafe. The height of the solid surface of the boundary wall should be limited to 1m and the remaining height if needed should be achieved using a metal grill. Also, hawkers and vendors add to one's visibility. Currently, they do not have a dedicated space for them. This results in their eviction and harassment. Proper Hawker Zones need to be created for them. These should be provided with Public Convenience facilities along with Street Furniture. Creating such zones throughout the city will help activate the public realm making one feel safer.
- Improve Public Transport facilities – the public transportation network of a city needs to be expanded to cover the entire city. The bus and metro network needs to span each locality. Also, in the current areas where the bus and metro connectivity exists, there is lack of last mile connectivity. Para-transit stands need to be created near the residential areas and outside markets for one to reach the metro/bus stop. These should be equipped with Public Convenience facilities and street furniture.



Cities' Initiatives



DELHI

LIGHTING IMPROVEMENT

Safetipin shared the Lighting Data on the 7,438 dark spots in Delhi with the Public Works Department (PWD), Delhi Government. This data specified the locations of Dark Spots i.e. points where lighting was rated poor in the city. Along with the roads under its jurisdiction, PWD obtained no objection certificate (NOC) from North Delhi Municipal Corporation (North DMC) and East Delhi Municipal Corporation (EDMC) to improve lighting along identified stretches in North and East Delhi. This project inaugurated by Mr Satyendra Jain, Minister (PWD) was set to complete by March 2017. South Delhi Municipal Corporation (SDMC) and New Delhi Municipal Council (NDMC) have also used the Safetipin data to improve the lighting in their respective areas.

Meetings were convened by Secretary, Power Department to bring together all the agencies and the stakeholders. These include all the four municipal corporations, (North, East, South DMC, NDMC), the road owning agencies namely PWD, Delhi Development Authority (DDA), and Delhi Urban Shelter Improvement Board (DUSIB). In January – March 2017, Safetipin team went on site visits around the city with the Electrical Engineers of respective zones. In April 2017, PWD and SDMC shared the list of roads where improvement work has been done. New streetlights have been installed and respective Horticulture Departments have been asked to undertake the regular pruning of trees that results in poor illumination



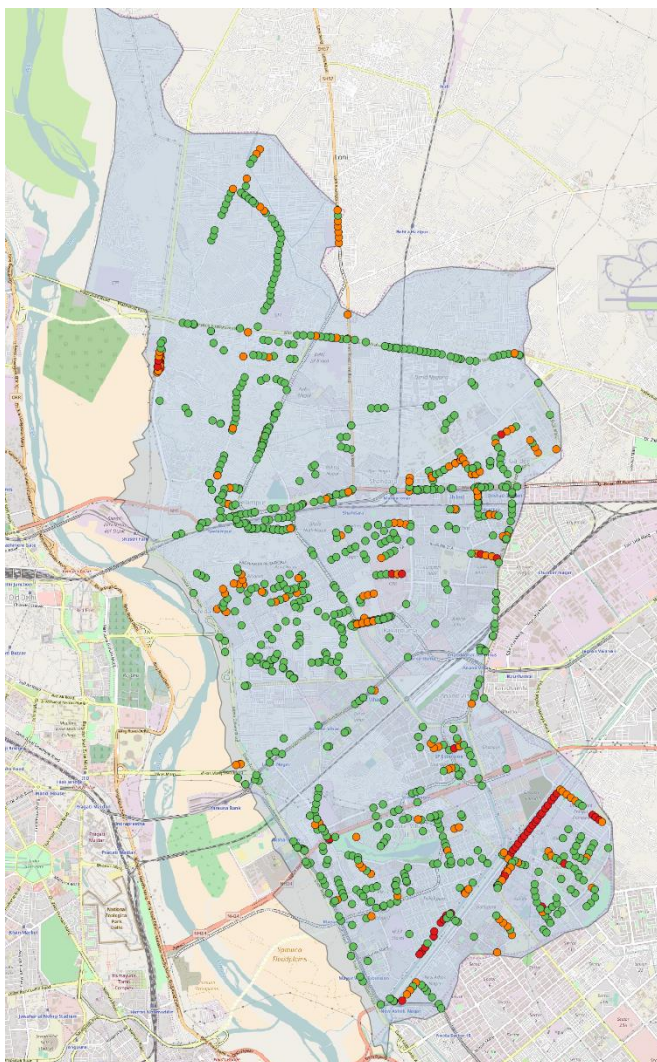
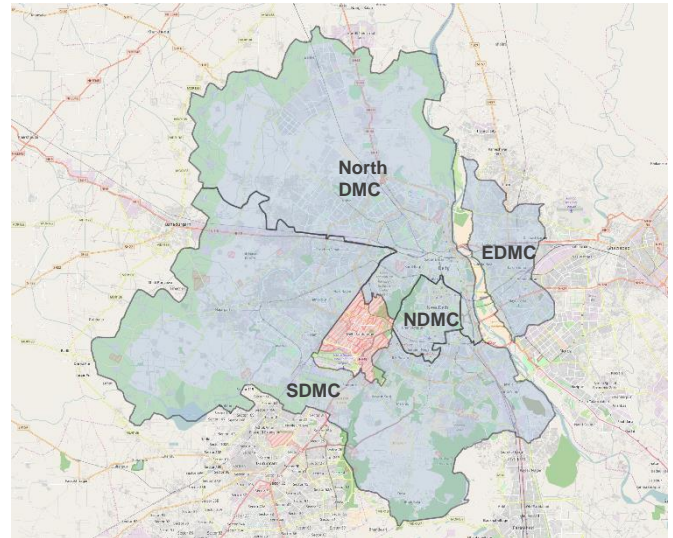
Source: [The Hindu](#), [Millennium Post](#)

“We will consider the lighting of dark spots to be done only after the Safetipin audit endorses that the work has been satisfactorily done.”

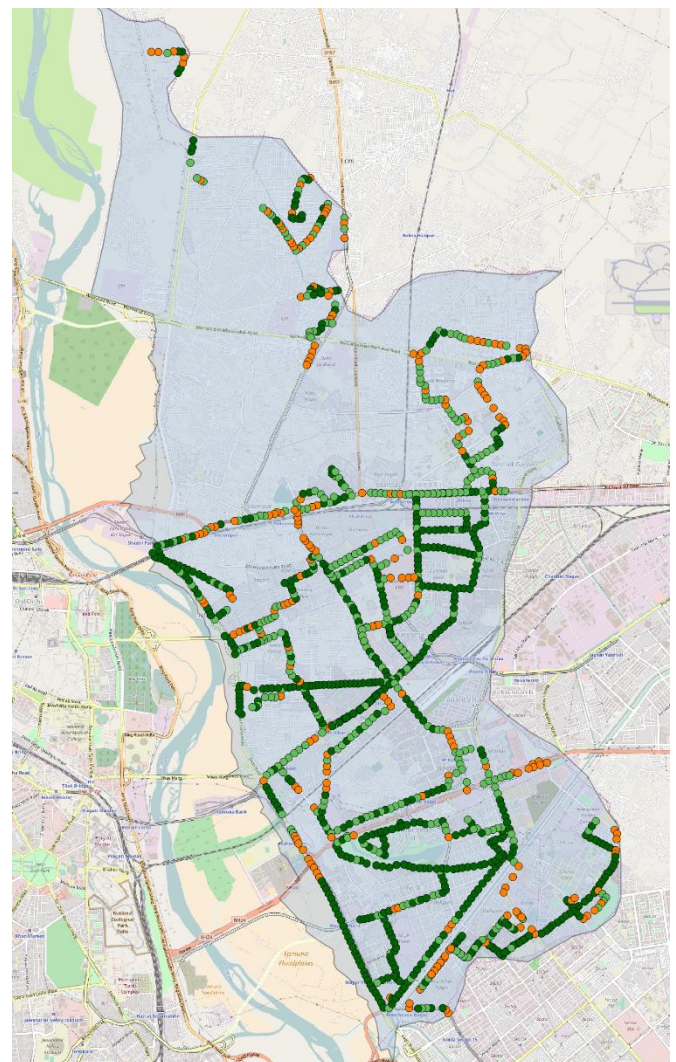
– Satyendar Jain,
Minister (PWD) speaking at
the inauguration of the
project

Phase II

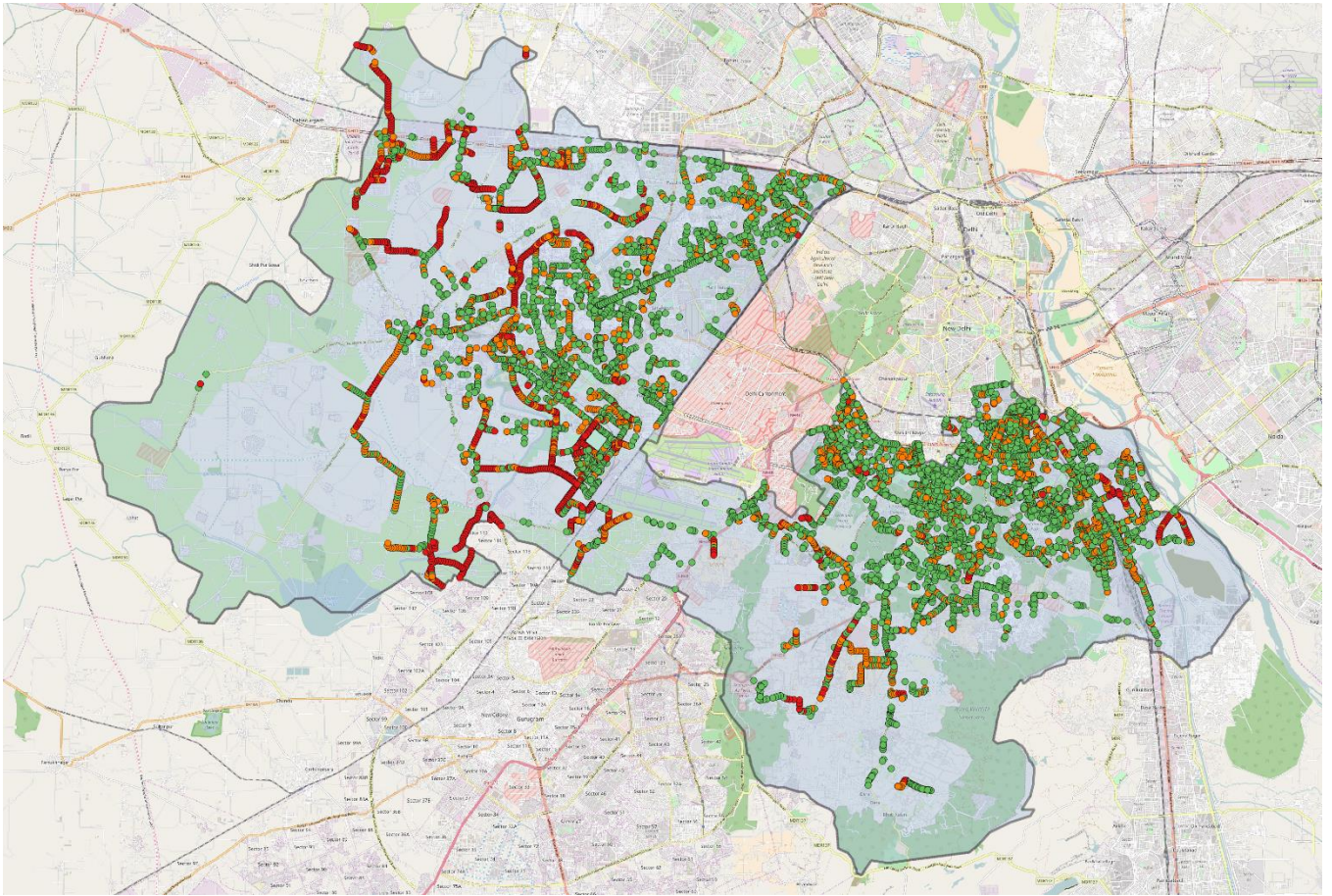
In May 2017, Safetipin conducted a second round of audits in East and South Delhi to assess the on-ground improvement. The audits were conducted using *Safetipin Nite* along the roads mentioned in the list given by the civic bodies. The map showing the rating of lighting before May 2017 and after May 2017 can be seen below for East Delhi, and on following page for South Delhi. From the audits and maps, it was found that the lighting has considerably improved in both East and South Delhi.



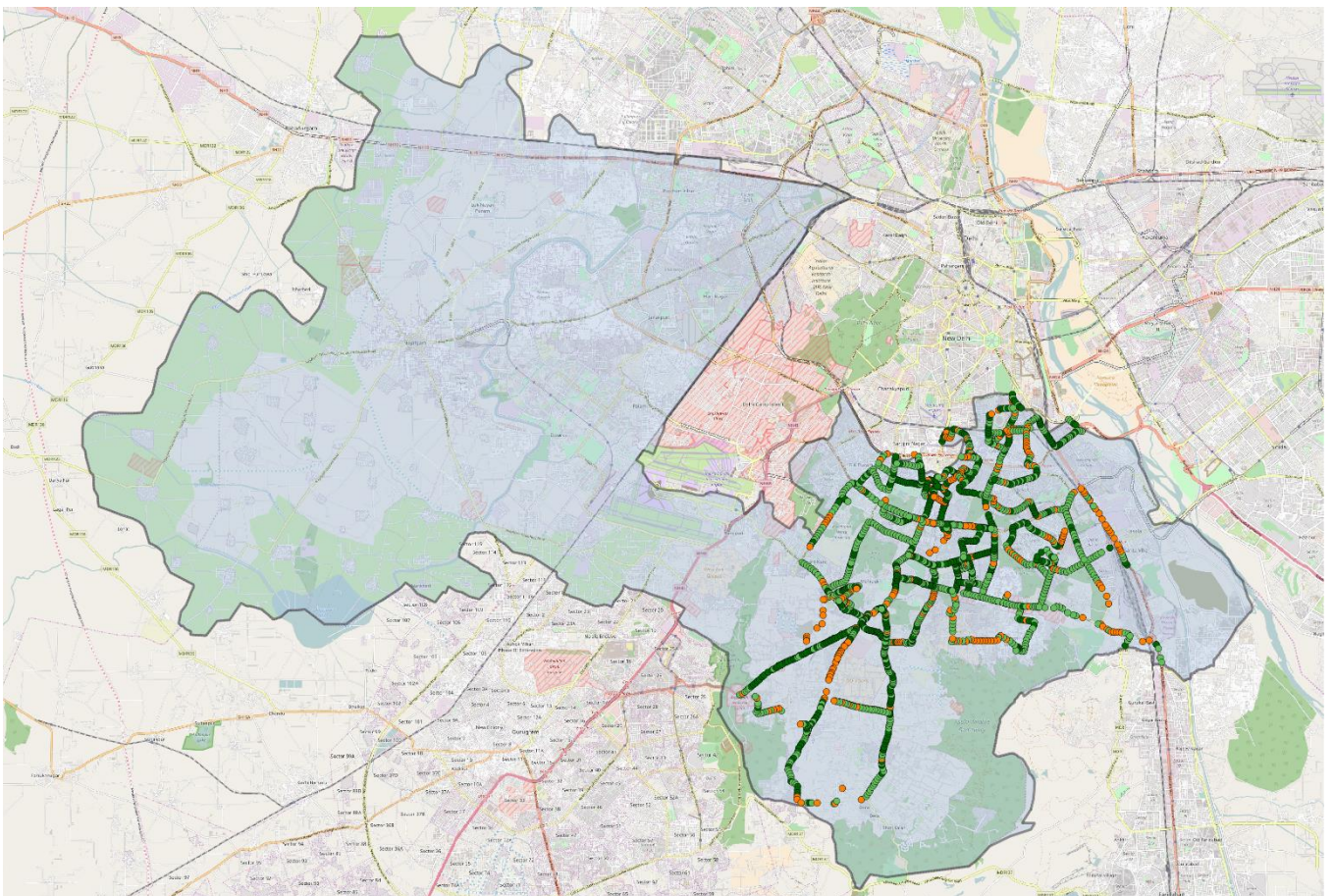
Lighting Rating of East Delhi before May 2017



Lighting Rating of East Delhi after May 2017



Lighting Rating of South Delhi before May 2017



Lighting Rating of South Delhi after May 2017

Survey

Based on the changes made by authorities on the lighting infrastructure, Safetipin team interviewed 48 people across four areas in South Delhi: Saket Metro Station Main Road, Shri Aurobindo Marg, Pushp Vihar and Chirag Delhi. The survey respondents were a mix of commuters, residents and street vendors who use the space regularly.

SAKET METRO STATION MAIN ROAD

The main road of the Saket metro station was surveyed to elicit people's views on the improvement work done by the government in terms of street lighting. Residents, street vendors, office workers, students and commuters in the area were asked questions related to the improvements. A total of 14 people were surveyed in this area. Of these, there were some street vendors, some who worked in the area and others who lived in the area. While most of the people found the area to be safe during all times of the day, some said that the streetlights don't work during rainy season. The T junction was a problem with trees covering the streetlights leading to inadequate lighting. On the other hand the street vendors who were also residents of the area found the lighting to be adequate and the area to be safe. More than lighting other social elements like unwanted male groups were found to be creating an unsafe environment. Some people did find a positive change in the lighting and most people found the lighting to be bright and sufficient.

SRI AUROBINDO MARG (NEAR SARVODYA ENCLAVE AND PRESS ENCLAVE)

Sarvodya Enclave and the Press Enclave along with the vehicular road linking the two were surveyed to note the changes in the lighting conditions of the area. The street vendors, shopkeepers, traffic police and commuters were asked questions on their observations on the area's lighting. It was found that the road linking the two stretches was lit by shops which were open till 10pm and the pedestrians therefore didn't notice the streetlights. However some streetlights were not in working condition on the main road. Overall the people found the area to be safe and the residents felt free to walk down the main road late at night irrespective of their gender.



Vendors' stalls in this area gets lighting from adjoining shops

**PUSHHP VIHAR
(SEC-3 MAIN ROAD and SHAHEED PANKAJ JUYAL MARG)**

Pushp Vihar sec 3 main road and the road leading to Shaheed Pankaj Juyal Marg were surveyed. Questions were asked to the residents, workers, street vendors, shopkeepers and commuters of the area to know if they have noticed any change in the lighting conditions of the area. In sec-3 main road the residents found the lighting to be adequate but the overall feeling of safety was found to be low due to lack of public and private security.

On the other hand, the road leading to Shaheed Pankaj Juyal Marg had no such issue with the shopkeepers, commuters and vendors finding the area to be safe and adequately lit. Some found the lighting to have improved over the last few months and also reported that there was regular maintenance checks of streetlights by the authorities in the area .



Vendors in Push Vihar find the lighting adequate

CHIRAG DELHI MAIN ROAD, LAL BHADUR SHASTRI MARG

Roadside vendors, commuters , rickshaw pullers and traffic police were asked questions about their observations on lighting. Most of the people found the area to be adequately lit but none reported of any change in the lighting conditions.

OVERALL FINDINGS

The areas surveyed gave a positive feedback from the people using them. With 65% of the people found the areas to have good lighting, 80% of the people found the areas to be safe.

57% were satisfied with the overall lighting of the areas and found it to be bright with only 20% of the people reporting a change in the illumination level. 27% of the people believed that regular maintenance checks could help in improving lighting conditions in the stretch.



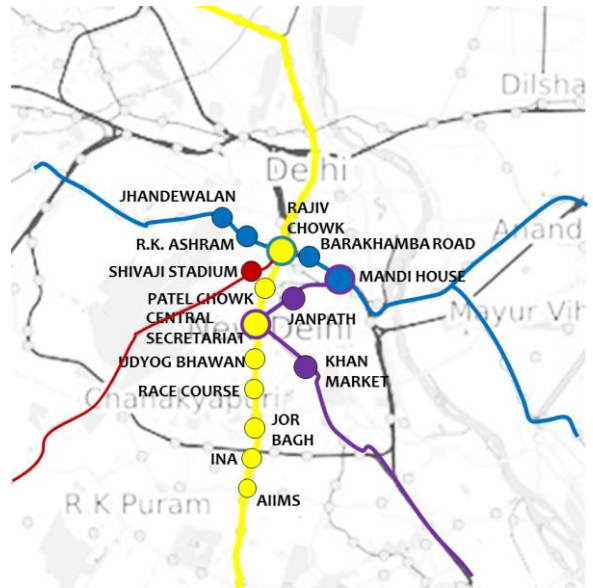
The traffic police near Chirag Delhi flyover observed no change

Analysis Reports

Last Mile Connectivity

Safetipin, in collaboration with New Delhi Municipal Council (NDMC) conducted a series of safety audits along all the 15 metro stations that fall under the jurisdiction of NDMC. An area of 500m radius around each metro station was audited by a team comprising of female architects from NDMC along with the Safetipin team. The teams from the National Association of Blind and Jagori were also part of these audits. The metro stations covered are I.N.A., Rajiv Chowk, Central Secretariat, A.I.I.M.S., Jhandewalan, R.K.Ashram, Udyog Bhawan, Race Course, Jor Bagh, Khan Market, Patel Chowk, Barakhamba Road, Mandi House, Shivaji Stadium and Janpath.

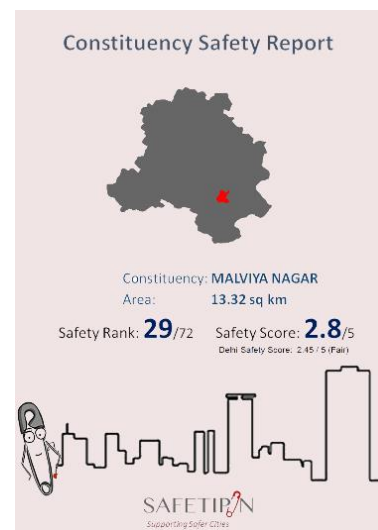
This was done to study perception of safety, and last mile connectivity around these metro stations. The area around Bus Stops and Auto Stands were also audited to understand the issues which make the area unsafe for women, elderly and physically challenged commuters. The report highlighted the areas that require immediate attention in terms of Lighting, Walkpath, Visibility and Public Transport. This report was submitted to NDMC Chairperson, who then asked respective departments to carry out improvement works.



Safety Analysis of Constituencies in Delhi

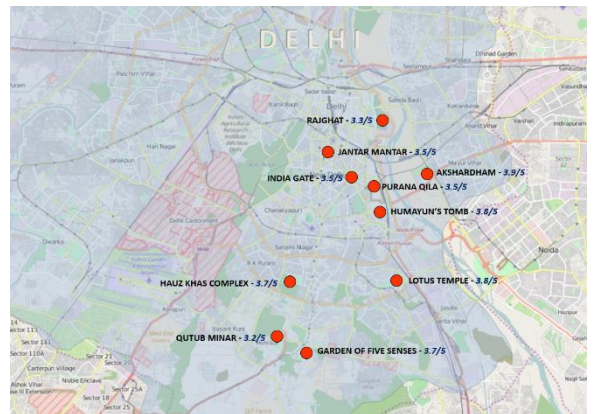
Safetipin prepared Constituency Safety Reports for each of the 70 constituencies of Delhi. These have been shared with the respective MLA's. Each constituency has been given a Safety Rank based on the Safety Score generated using all the safety audit pins within that area.

The report highlights the current situation on-ground, along with gaps in infrastructure which need to be fixed to ensure safety of women at night in each constituency.



Safety Audits around Tourist Places in Delhi

Safetipin, in collaboration with Delhi Tourism and Transport Development Corporation (DTTDC) undertook Safety Analysis around ten tourist places of Delhi. The ten tourist places are Qutub Minar, Humayun's Tomb, Purana Qila, Lotus Temple, India Gate, Akshardham, Hauz Khas Monuments, Garden of five senses, Rajghat and Jantar Mantar. The Safetipin Team conducted audits and safety analysis of the area around each place, the access route to the place i.e. from metro station / bus stop to the entry gate. The report containing the findings of the audits along with the recommendations has been submitted to Tourism Department of Delhi Government and DTTDC.



Safety Chaupal and OSAM

Public participation is essential to understand and give visibility to what happens in certain spaces. To document community knowledge about the place, and to capture the daily experience of women, Safety Chaupals (Safety Centres) are held.

Safetipin, in collaboration with Jagori conducted safety audits in low income neighbourhoods of Badarpur, Bawana and Madanpur Khadar. The neighbourhoods of Molarbund Gaon and Tajpur Pahadi in Badarpur, JJ Colony in Bawana, and JJ Colony in Madanpur Khadar were taken up for the study. Volunteers were trained to use My Safetipin app and The sessions at Safety Chaupal enabled the community women to hold dialogues with the local government authorities and advocate for safer neighbourhoods. They submitted an application to the local MLA demanding improved lighting and a community space in Badarpur. As a result, new streetlights were installed and a 'Barat Ghar' (Community House) was built for the women.

During Anti- Street Harassment Week (April 2nd – 8th, 2017) Open Space Audit Mapping (OSAM) sessions were held at public squares in Madanpur Khadar and Bawana. Maps displaying Safetipin data were displayed to raise awareness and get the residents' perception on safety. The data was also shared with local police in Madanpur Khadar.



OSAM at Madanpur Khadar



OSAM at Bawana

BOGOTA

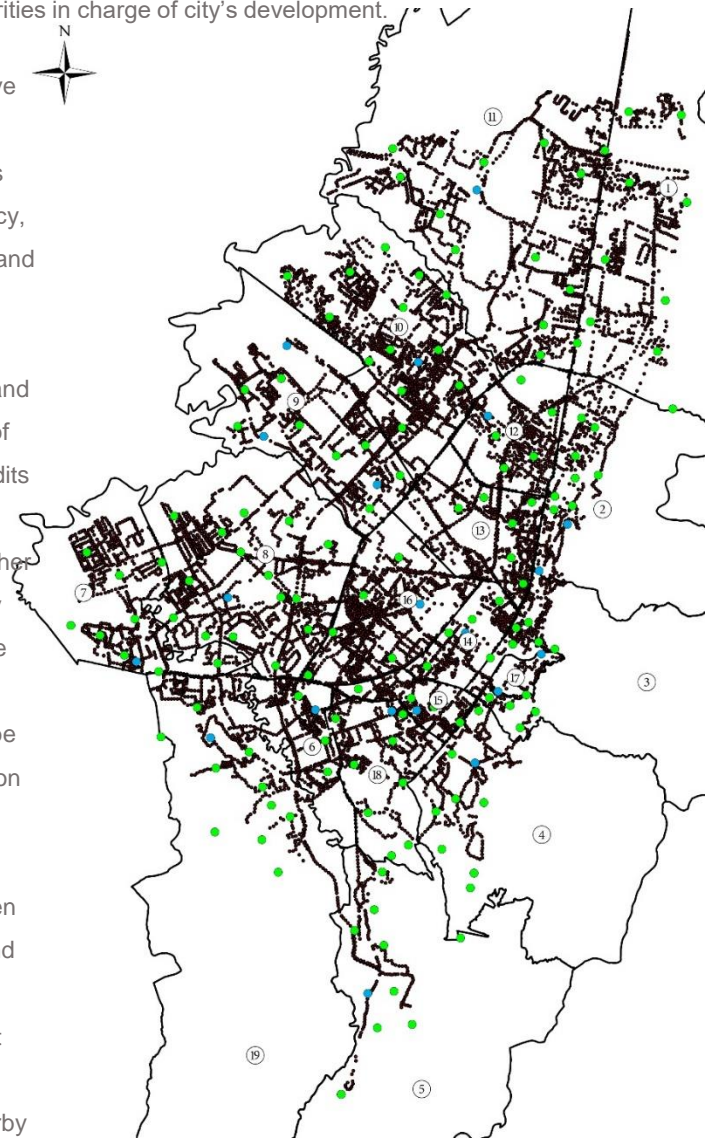
The information gathered in the first phase of Safetipin in Bogota has been used as a source of information for the prioritization of local and municipal investments in infrastructure, specifically, lighting in parks, installing CCTV cameras and rebuilding pathways for better access. The Secretary of Women of the city has provided information that comes from various parameters of safety audits to the respective authorities in charge of city's development.

The 19 urban localities that compose the city of Bogota have the obligation of developing a Local Plan for the Security of Women. The information gathered by Safetipin's audits has been used in gender mainstreaming in the city's public policy, specifically in public space decisions, in land use planning and in the city's overall security plans.

One of the greatest challenges of public policy in general, and of public policy for women's and gender issues is the lack of information for decision making. The data based on the audits gathered by Safetipin in its initial phase (photographic analysis) has allowed the city of Bogota to co-relate with other types of information, for example points having low security with locations having high rate of crimes. For the same, the city's cadastral authority has included a layer based on the safety audits in the official cartography of the city that can be contrasted with all the cadastral and cartographic information of the city.

This can be seen in this map that shows correlation between the low rating in terms of security parameter (red points) and the location of Police stations (blue points) and CAI (green points). It was found that while Ciudad Bolivar has the least percentage of security presence, La Candelaria have the highest percentage of police presence on the street or nearby police stations. La Candelaria is an administrative as well as popular locality visited by national and foreign tourists, that explains the greater visibility of the agents of the public force.

Thus, Safetipin data has allowed the Secretary of Women to generate a more qualified impact in public opinion. There has been interest from Colombia's mayor papers in this information and it has been able to start a national debate regarding safety for women in public space based on data.



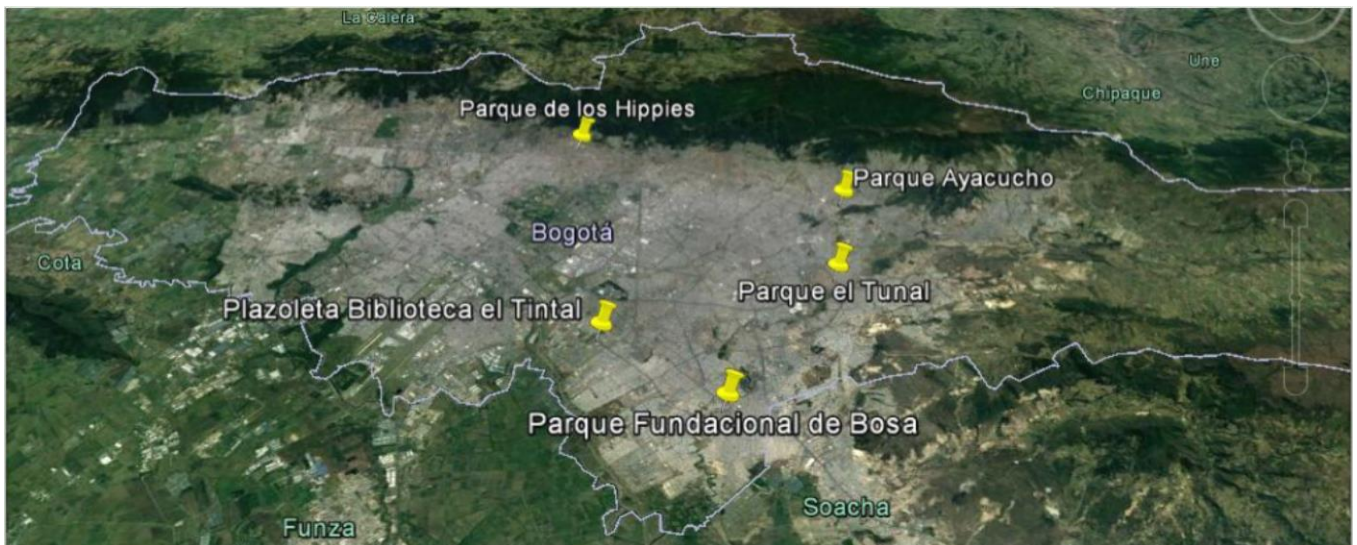
Map indicating the security parameter rating and the location of police stations

Localidades		Convenciones					
①	Usaquén	⑦	Bosa	⑭	Los Mártires	•	Puntos ninguna presencia de seguridad
②	Chapinero	⑧	Kennedy	⑮	Antonio Nariño	●	CAI
③	Santa Fe	⑨	Fontibón	⑯	Puente Aranda	●	Estación de policía
④	San Cristóbal	⑩	Engativá	⑰	La Candelaria		
⑤	Usme	⑪	Suba	⑱	Rafael Uribe Uribe		
⑥	Tunjuelito	⑫	Barrios Unidos	⑲	Ciudad Bolívar		
		⑬	Teusaquillo				

Source: District Secretary of Women, Safetipin research. OMEG-SDMujer calculations

'Women Taking the Night'

Through the analysis of this georeferenced information, and with the support of the territorial team of the SOFIA strategy, that belongs to the Elimination of Violence and Access to Justice Department of the Secretary for Women, five points of the city were identified to prioritize and intervene. These localities are Tunjuelito-Ciudad Bolívar, San Cristóbal-Usme, Chapinero, Kennedy and Bosa.



Map indicating the five identified locations for the campaign

Women's District Secretariat under the slogan "Women taking the night" carried out five night sessions at sites (as shown in the map) that are closest to the areas identified as unsafe for women after dark. Among the participants were citizens, Local Operative Councils for Women and Gender, and local women's organizations. The selected area was set up with tents, platforms and communicative elements. The participants were asked to participate in a cultural events, that also communicated about the situation regarding the rights of women to have a live free of violence. These events were aimed at engaging people to feel comfortable as well as a feeling of ownership of public spaces so that they could be made more active. The events were held in evenings and a total of 1978 men and women participated in this campaign. Pla. Tintal, Kennedy registered the maximum number of participants. Addressing usage of spaces at night is more complex than fixing lights or infrastructure but involves people and perceptions as well as activities an engagement.



PARTICIPANTS				
	Event Location	Women	Men	TOTAL
1	P. el Tunal. Tunjuelito	197	219	416
2	P. Ayacucho. San Cristóbal	264	196	460
3	P. hippies. Chapinero	112	142	254
4	Pla. Tintal. Kennedy	300	332	632
5	P. Fun Bosa, Bosa	125	91	216
	TOTAL	998	980	1978

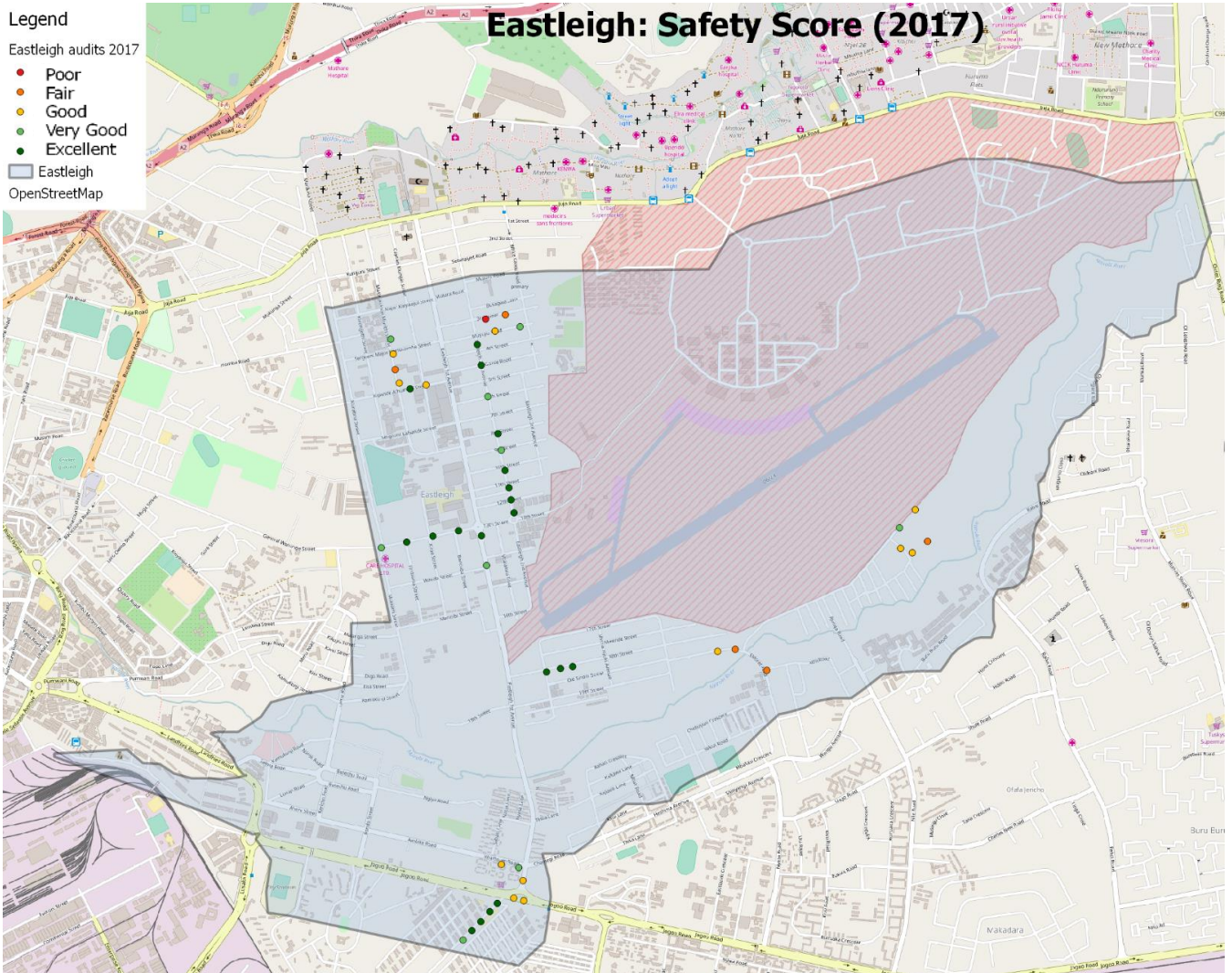
Source: Distrist Secretary of Women. (Bogotá, D.C. 2016)

NAIROBI

Nairobi City County used Safetipin data for their ongoing and proposed projects. They identified two neighbourhoods, Eastleigh and Pipeline for data collection and instituted changes in one i.e. Eastleigh as a part of Area Development Project. The findings on various parameters by Safetipin supported the interventions proposed to improve physical infrastructure in Eastleigh. The City County worked with Kenyan Urban Authority along with local business community to revitalize the neighbourhood. The initiatives and projects planned are:

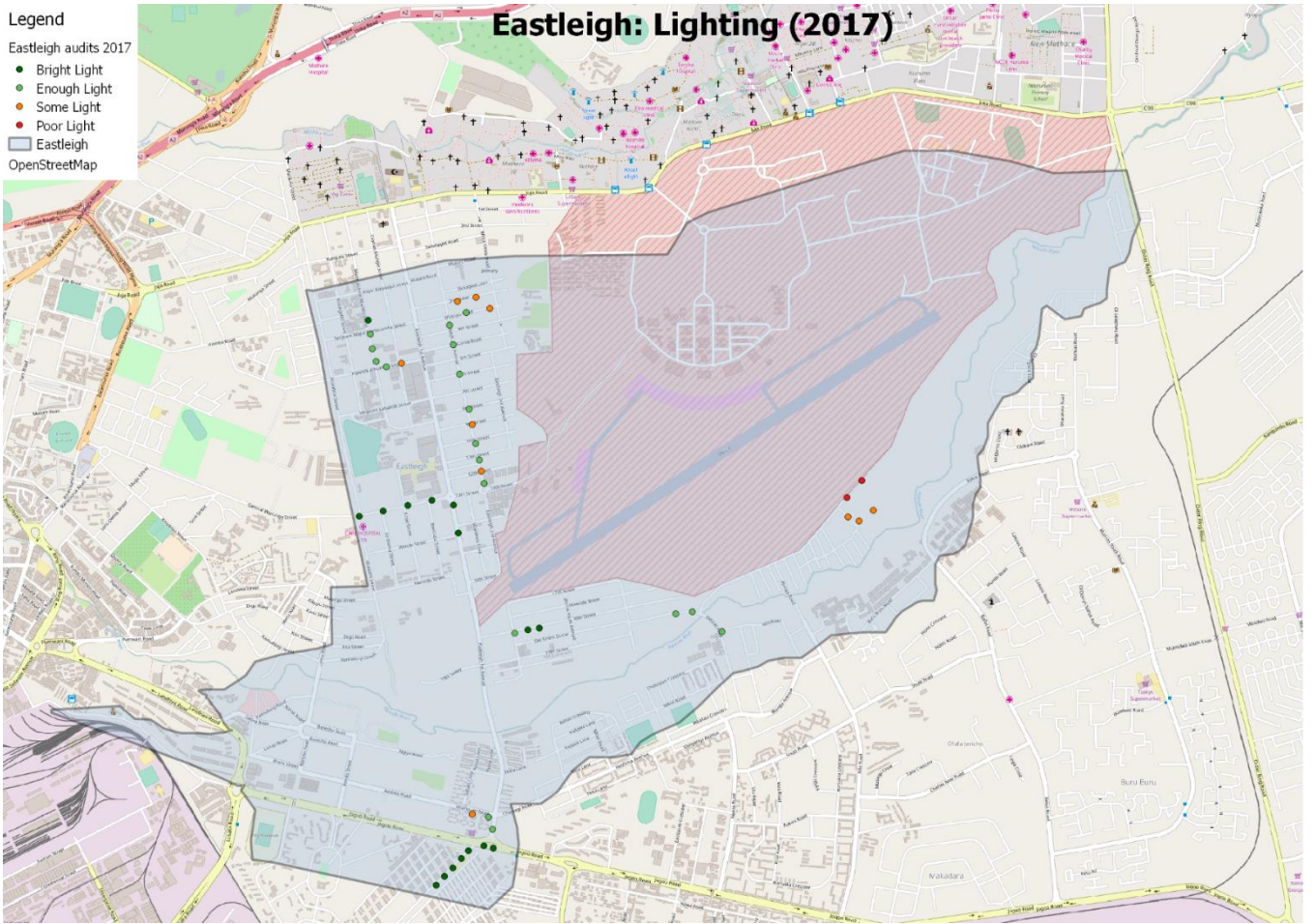
- Improving lighting
- Improving Road infrastructure
- Solid Waste Management
- Improving Public Transport
- Reworking Traffic circulation

To assess the improvements, a second round of audits were conducted in March 2017 in Eastleigh. A total of 46 audits were generated using Safetipin Nite App as seen in the map below. The map showing ratings of lighting and walkpath can be seen on the following page.



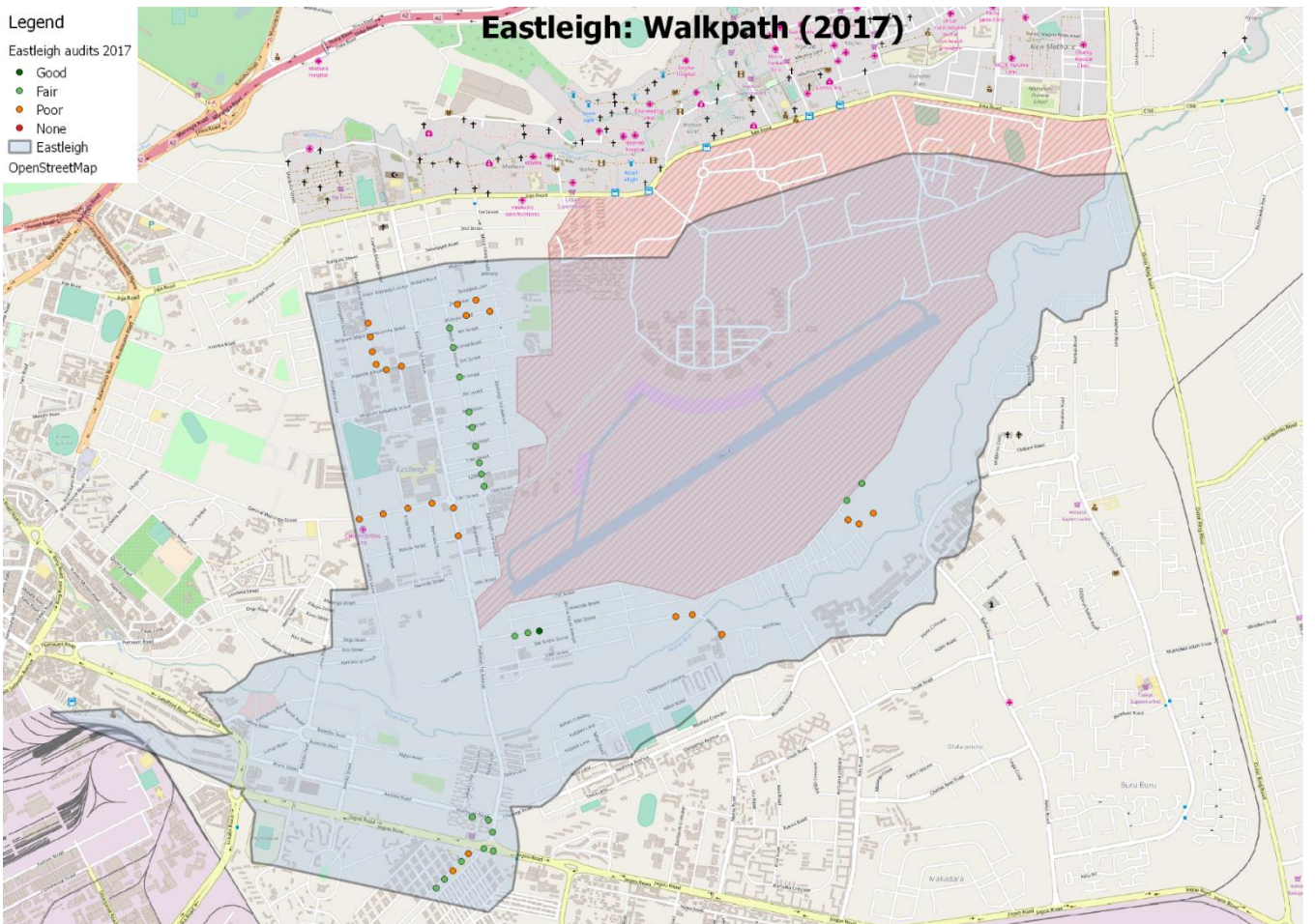
Legend

- Eastleigh audits 2017
- Bright Light
- Enough Light
- Some Light
- Poor Light
- Eastleigh
- OpenStreetMap



Legend

- Eastleigh audits 2017
- Good
- Fair
- Poor
- None
- Eastleigh
- OpenStreetMap





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