

# NAIROBI

A Safety Analysis Report



# Nairobi

## Safety Score: 3.1/5



### Introduction

Safetipin, in partnership with the Nairobi City County, conducted safety audits in city of Nairobi supported by UN Habitat and Cities Alliance.

Safetipin, is a map-based mobile phone and online application, 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 Women's Safety Audit. A Women's Safety Audit (WSA) 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.

### Methodology

The safety audits have been generated using two methods. First, manual audits were conducted by volunteers using the My Safetipin app at night. A total of 4,956 manual audits were conducted. Secondly, safety audits have been generated using the Safetipin Nite app. Uber taxis and local taxis of Nairobi were hired for this purpose. Mobile phones were mounted on the windshield and using the app photographs of the city roads were taken. These photographs were then assessed based on the eight audit parameters to generate audit pins at each location.

A total of 11,807 audit pins have been generated over 685 km of road length.



11,807 Audit Pins



685 km



Light(Night)

Lighting measures the amount of brightness / illumination at a place and ranges from Dark to Bright. A place can be lit with 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.



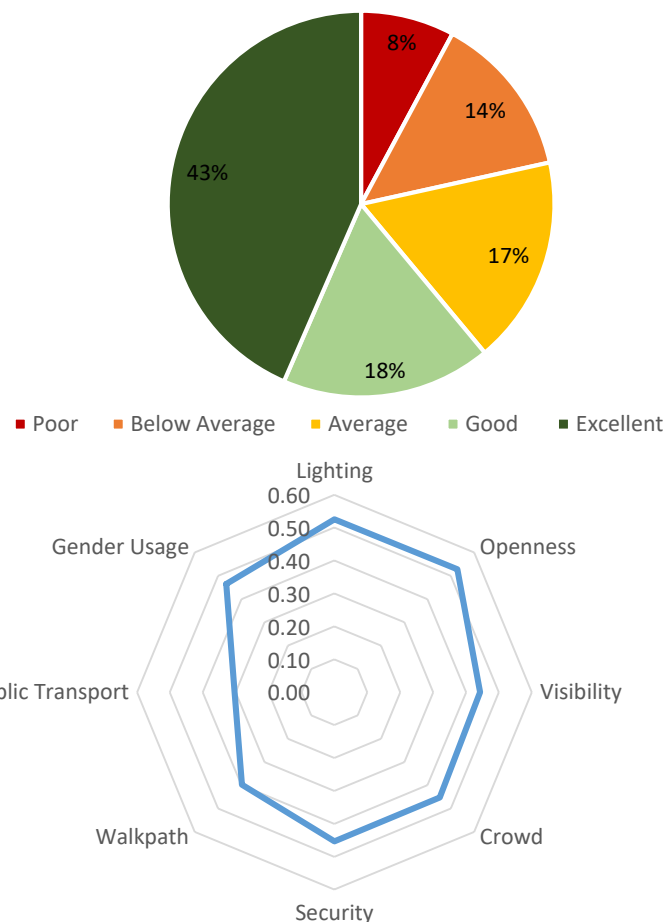
## Safety Score

The Safety Score of a point is a reflection of the perception of safety at that particular location. For each audit point it is a number between 0 and 5, 0 being Poor i.e. Very Unsafe and 5 being Excellent in terms of overall safety.

**The overall Safety Score for city of Nairobi is 3.1/5 i.e. Good.**

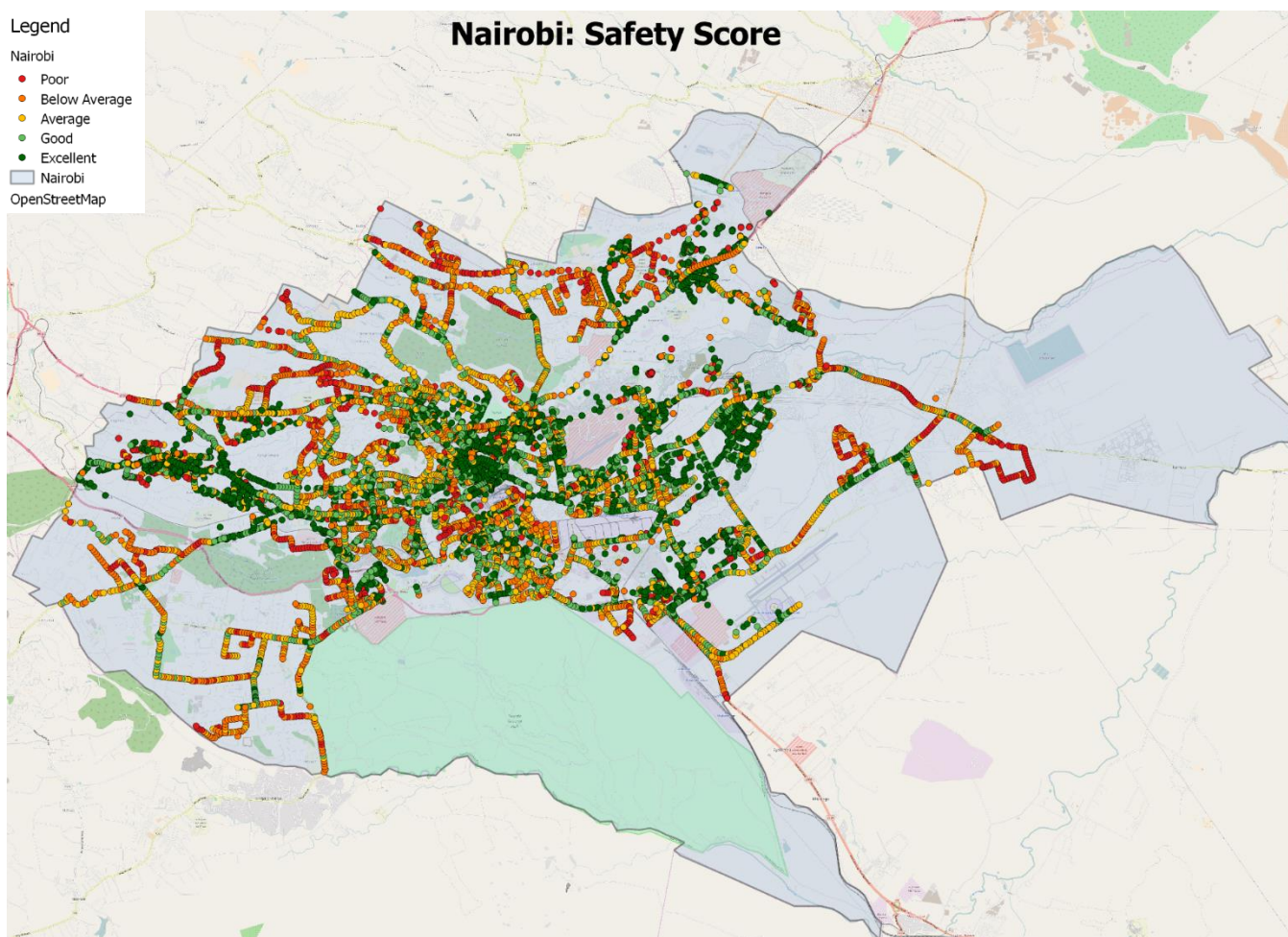
Indicated in the pie chart is the percentage distribution of pins in each range. The Safety Score has also been indicated in the map below. Around 43% of the audit points were found to be safe whereas 22% of the points were rated poorly and needs improvement.

The parameters' co-relation with the feeling of safety is indicated in the co-relation graph. From the manual safety audits, the parameters of Lighting, Openness and Gender Usage were found to contribute the most to the feeling of safety.



### Legend

Nairobi  
 ● Poor  
 ● Below Average  
 ● Average  
 ● Good  
 ● Excellent  
 ■ Nairobi  
 ■ OpenStreetMap



Map indicating Safety score of Nairobi

## Parameter Ratings

Each of the nine parameters is rated 0/1/2/3, 0 being the poorest and 3 good. The average parameter ratings graph indicates the overall average rating for each parameter. Openness has been rated Above Average. Walkpath, Lighting and Public Transport have been rated Average. Visibility, Crowd, Security and Gender Usage have been rated Below Average. The overall Feeling of Safety for Nairobi City has been rated as Average.

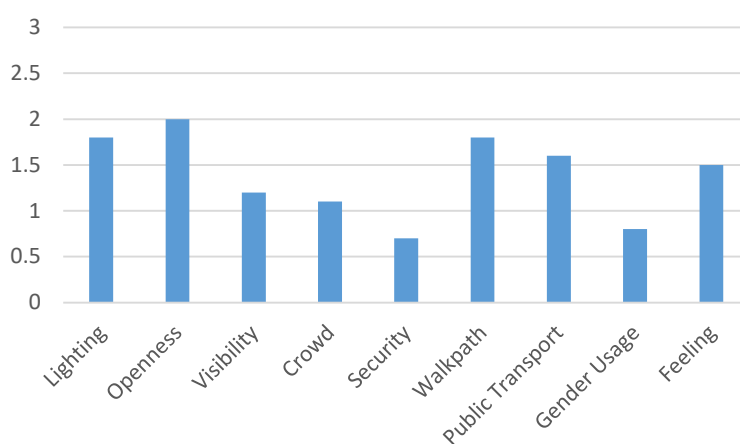
The Parameter wise pin distribution graph indicates the number of points rated 0/1/2/3 i.e. the good points as positive and poor ratings as negative. The parameters of Security and Gender Usage have been rated poorly for most parts of the city followed by Visibility and Crowd. Lighting and Public Transport needs to be improved in some locations and the Walkpath conditions needs to be improved in few locations.

The Impact Bar Graph indicates the extent of influence and the relative impact that each parameter has on the perception of safety. Different parameters have different levels of impact on the perception of safety. The combined length indicates the impact potential of the parameter. The parameters with the maximum combined length have the highest impact on the perception of safety and vice versa i.e. The audits indicate that for Nairobi City, Lighting has the maximum impact and Transportation the least. The positive length (in green) indicates the extent of provision that has already been made on ground. The negative length (in red) indicates the (remaining) amount of improvement needed.

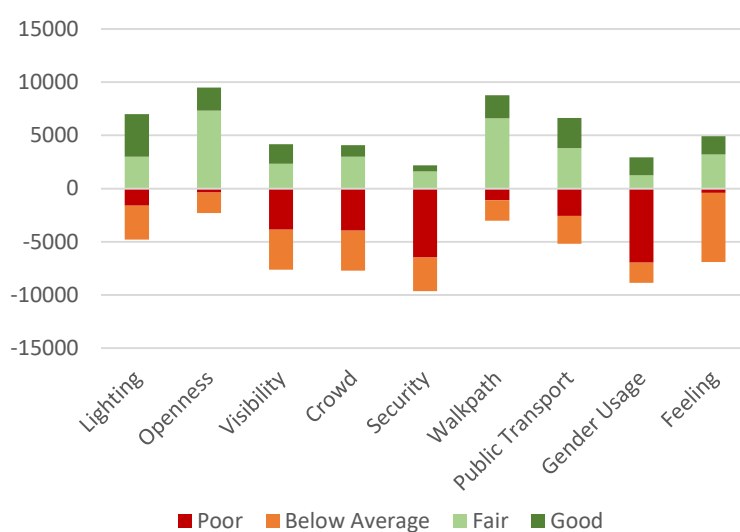
Gender Usage and Crowd are derived parameters i.e. improving the other parameters will result in a location being safer and hence more people, especially women using it at night. As seen from the bar graph Lighting, Visibility and Security parameters need to be improved followed by the Walkpath.

Parameter-wise pin distribution maps can be seen on the following pages.

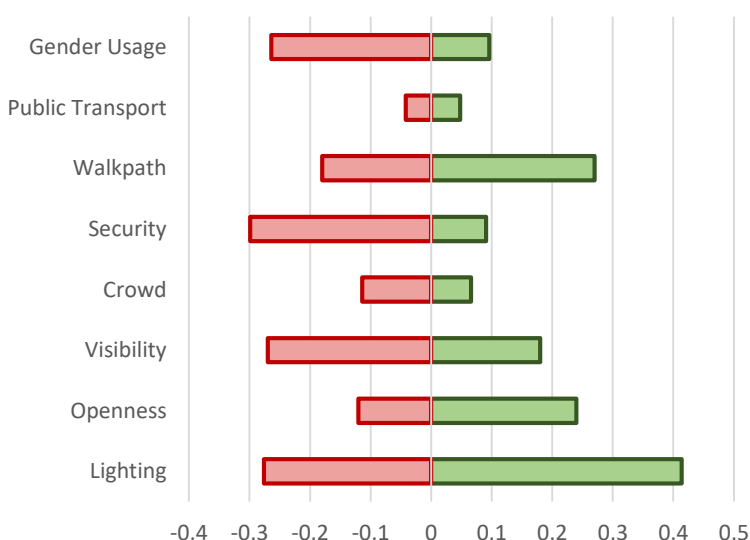
**Average Parameter Ratings**



**Parameter wise Pin Distribution Graph**



**Gap Impact Graph**



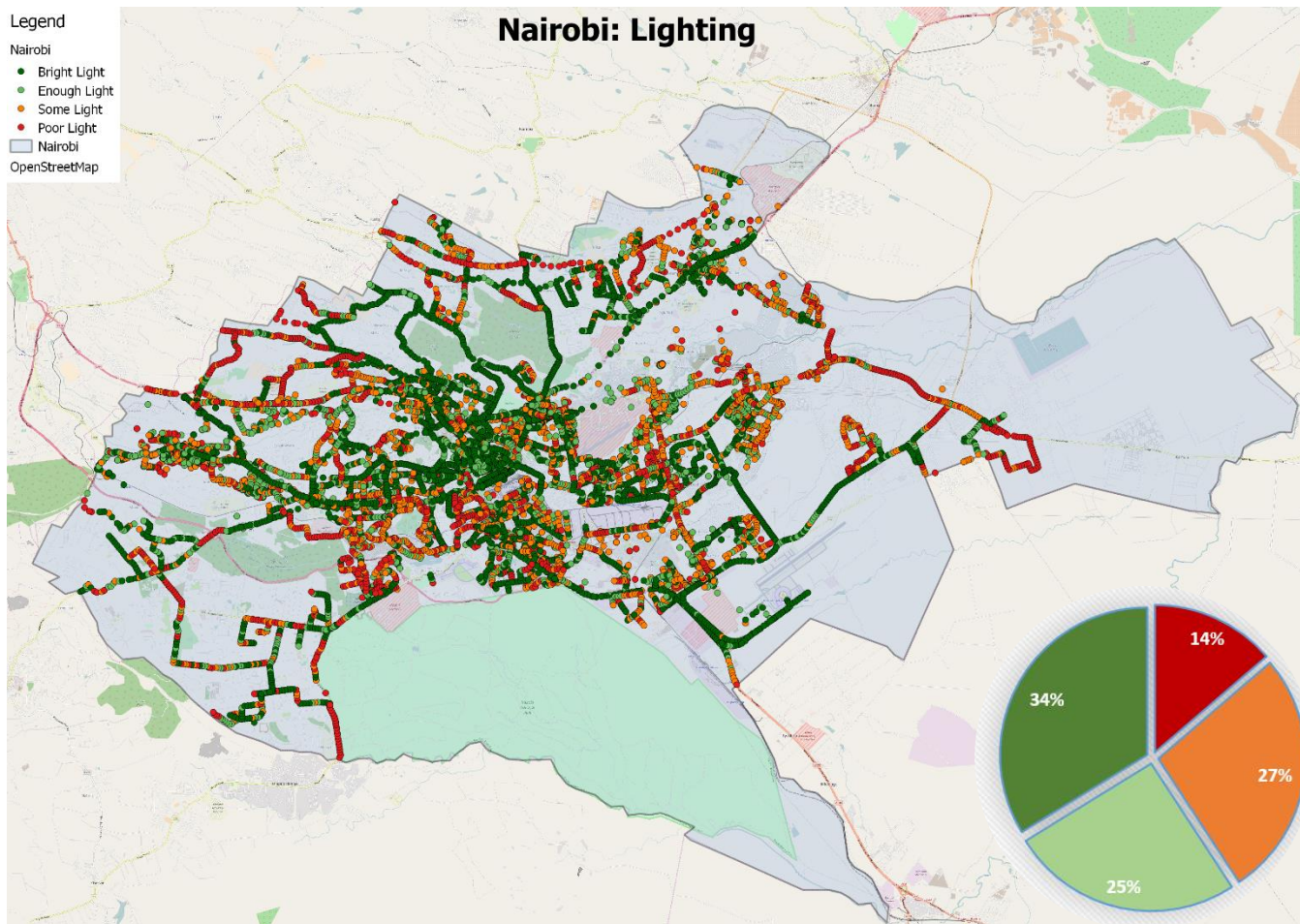


### Legend

Nairobi

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

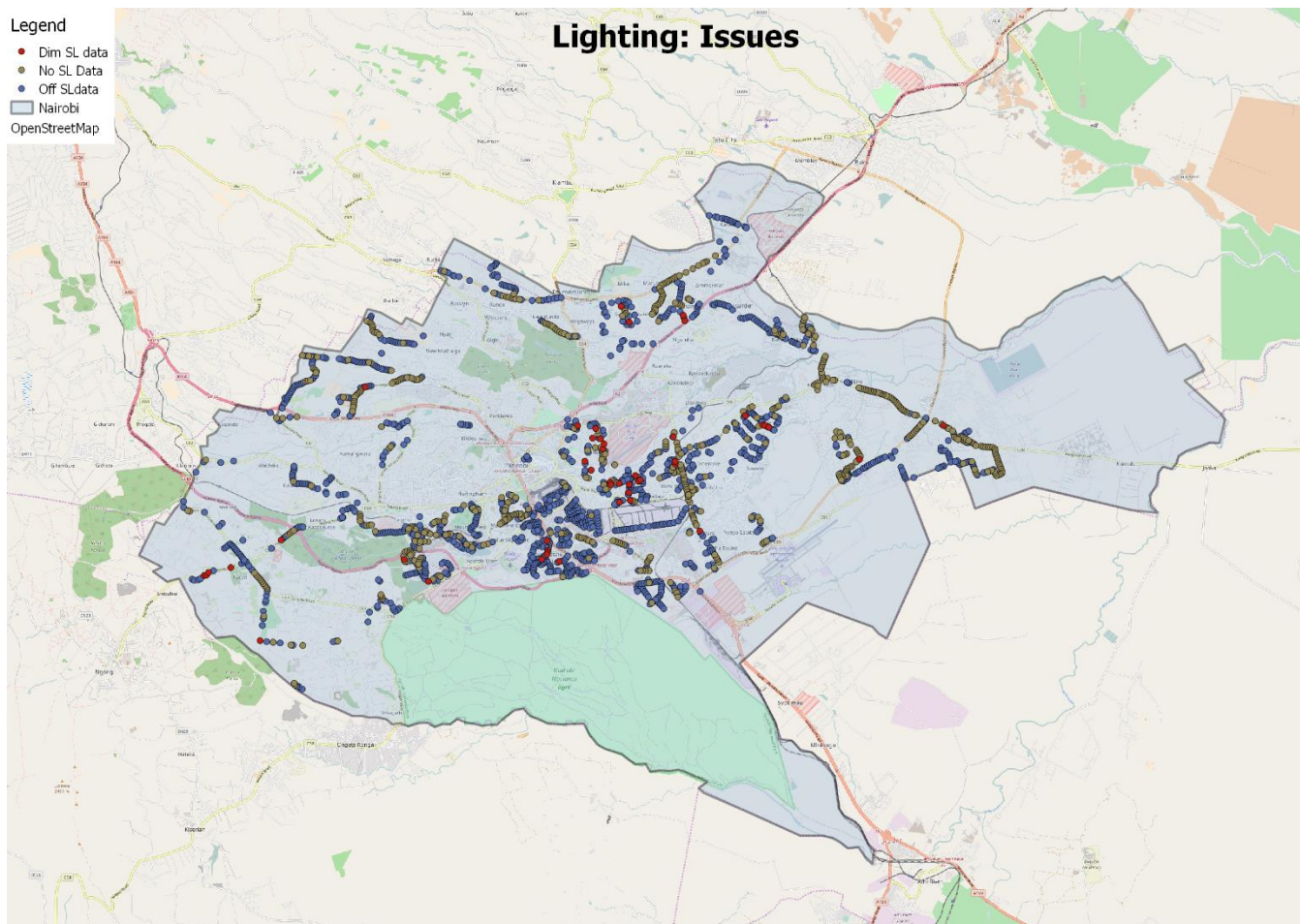
## Nairobi: Lighting



### Legend

- Dim SL data
- No SL Data
- Off SLdata
- Nairobi
- OpenStreetMap

## Lighting: Issues





## Legend

Nairobi

Good

Fair

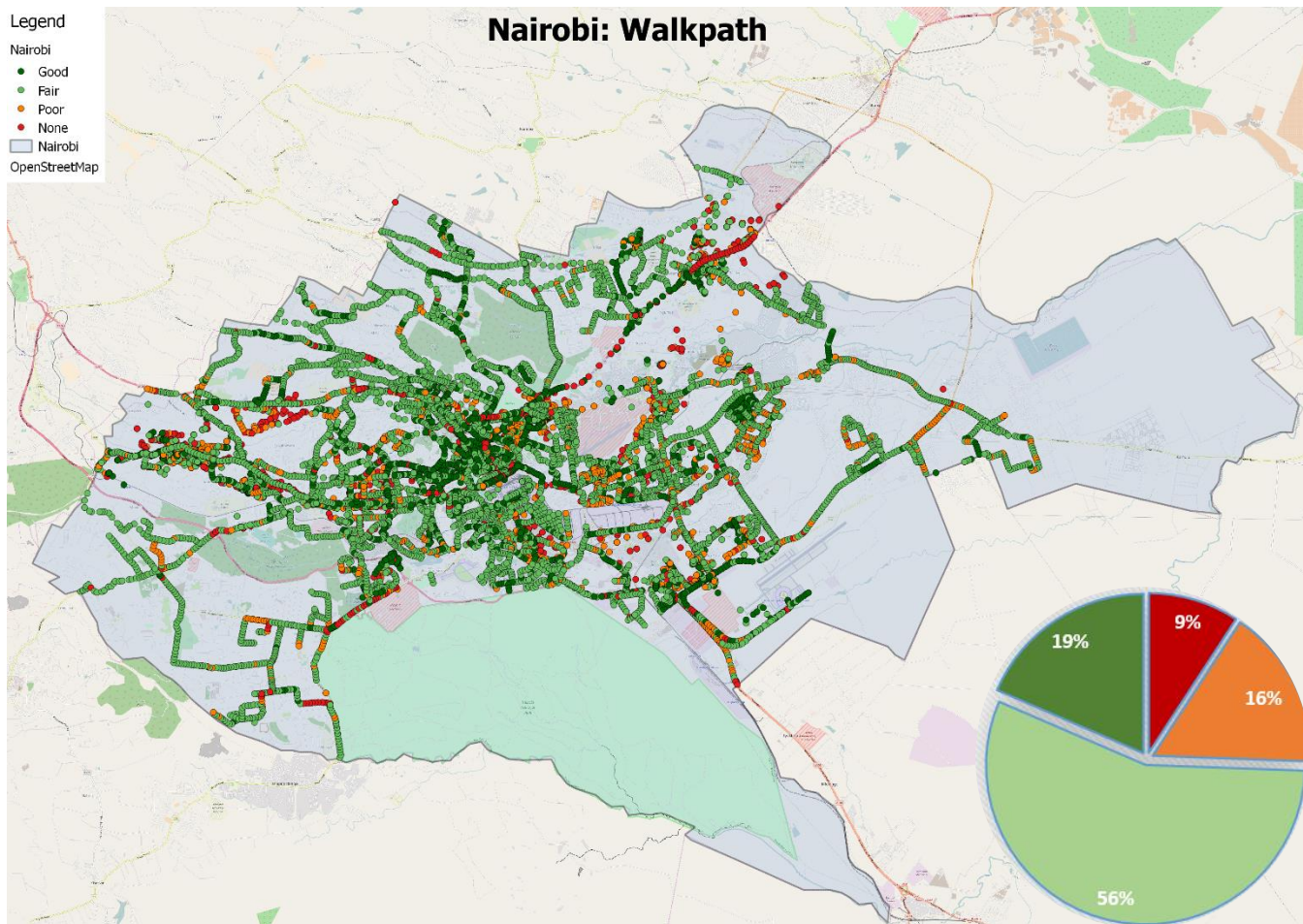
Poor

None

Nairobi

OpenStreetMap

## Nairobi: Walkpath



## Legend

Broken pavement

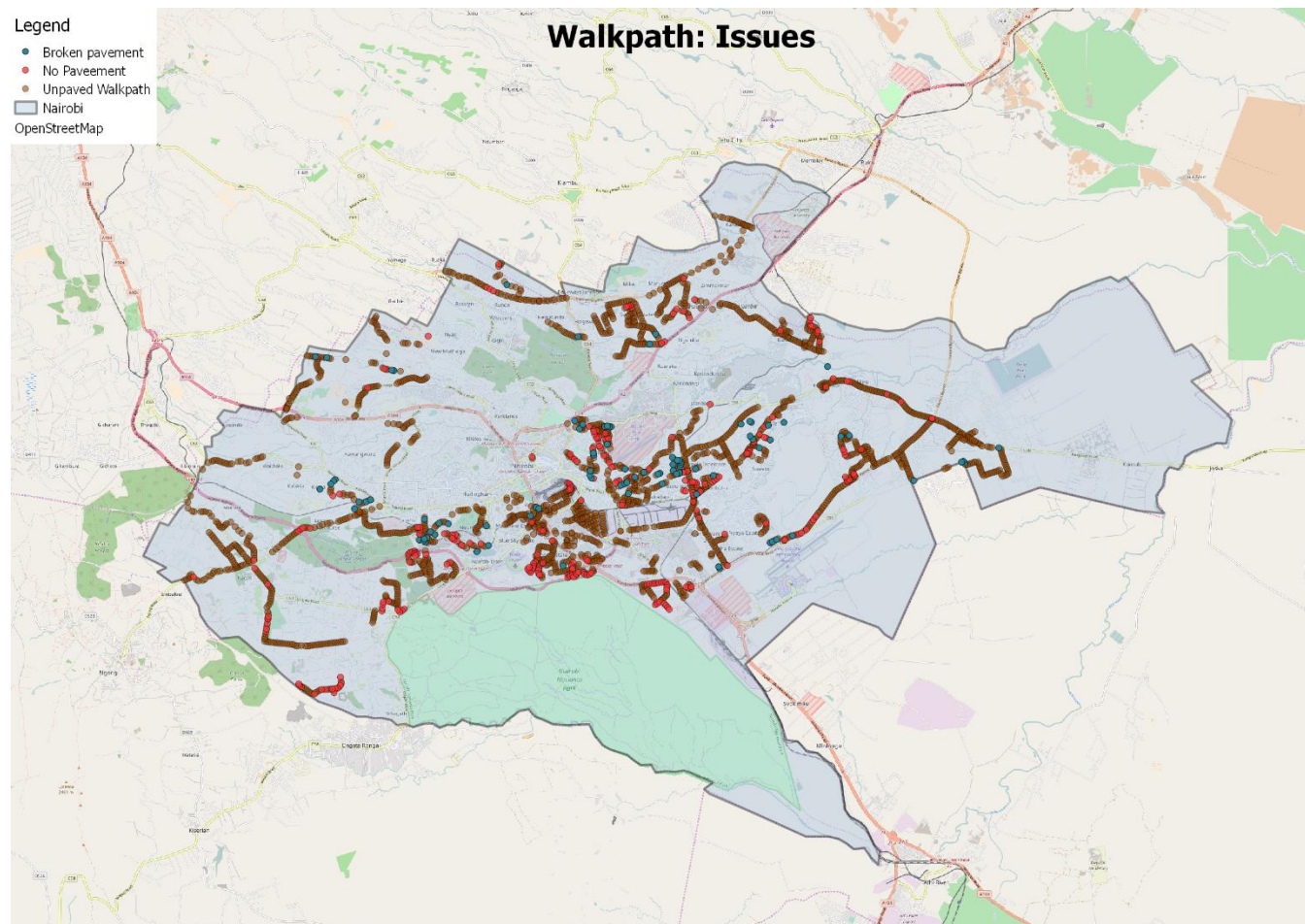
No Pavement

Unpaved Walkpath

Nairobi

OpenStreetMap

## Walkpath: Issues

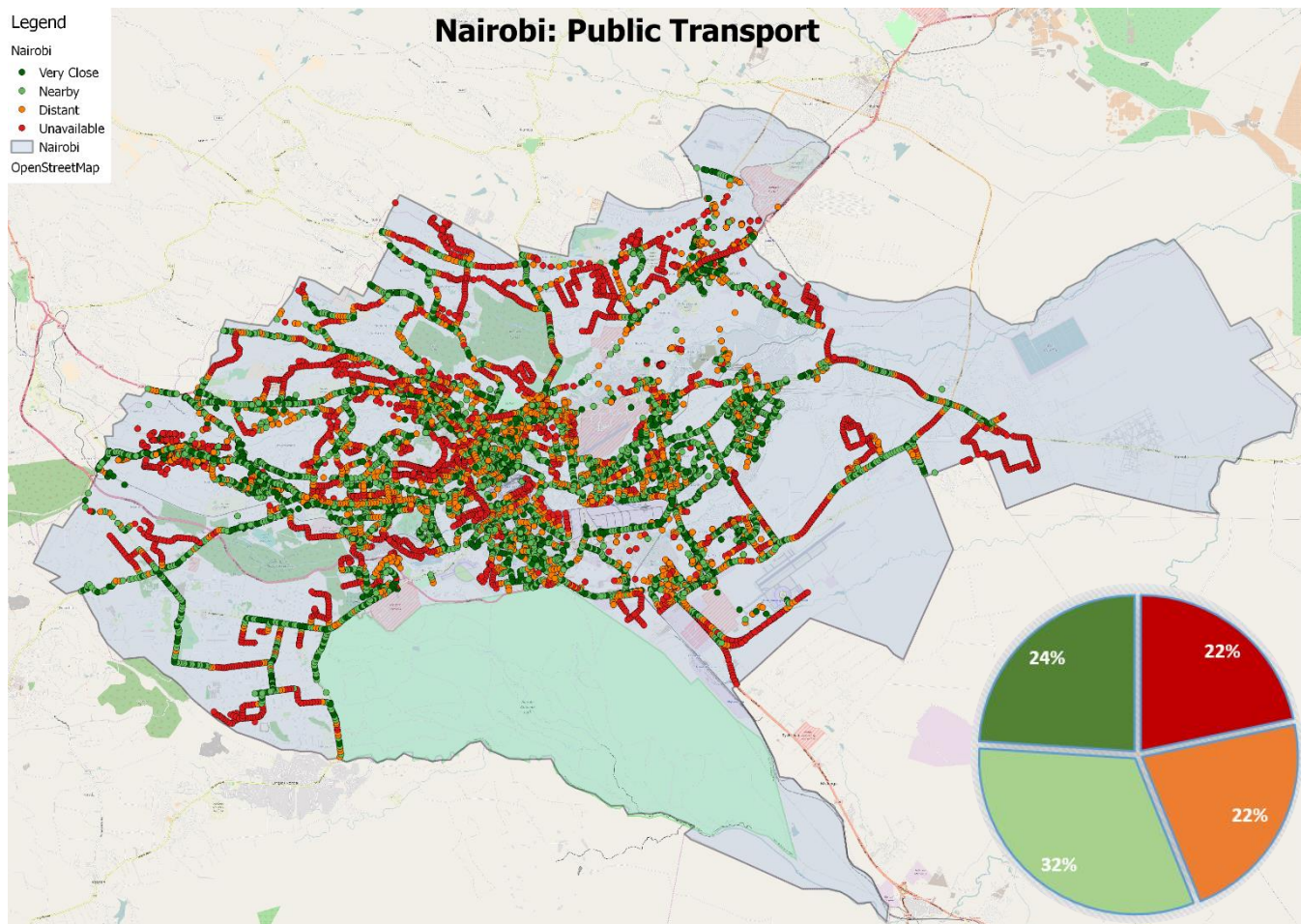




### Legend

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

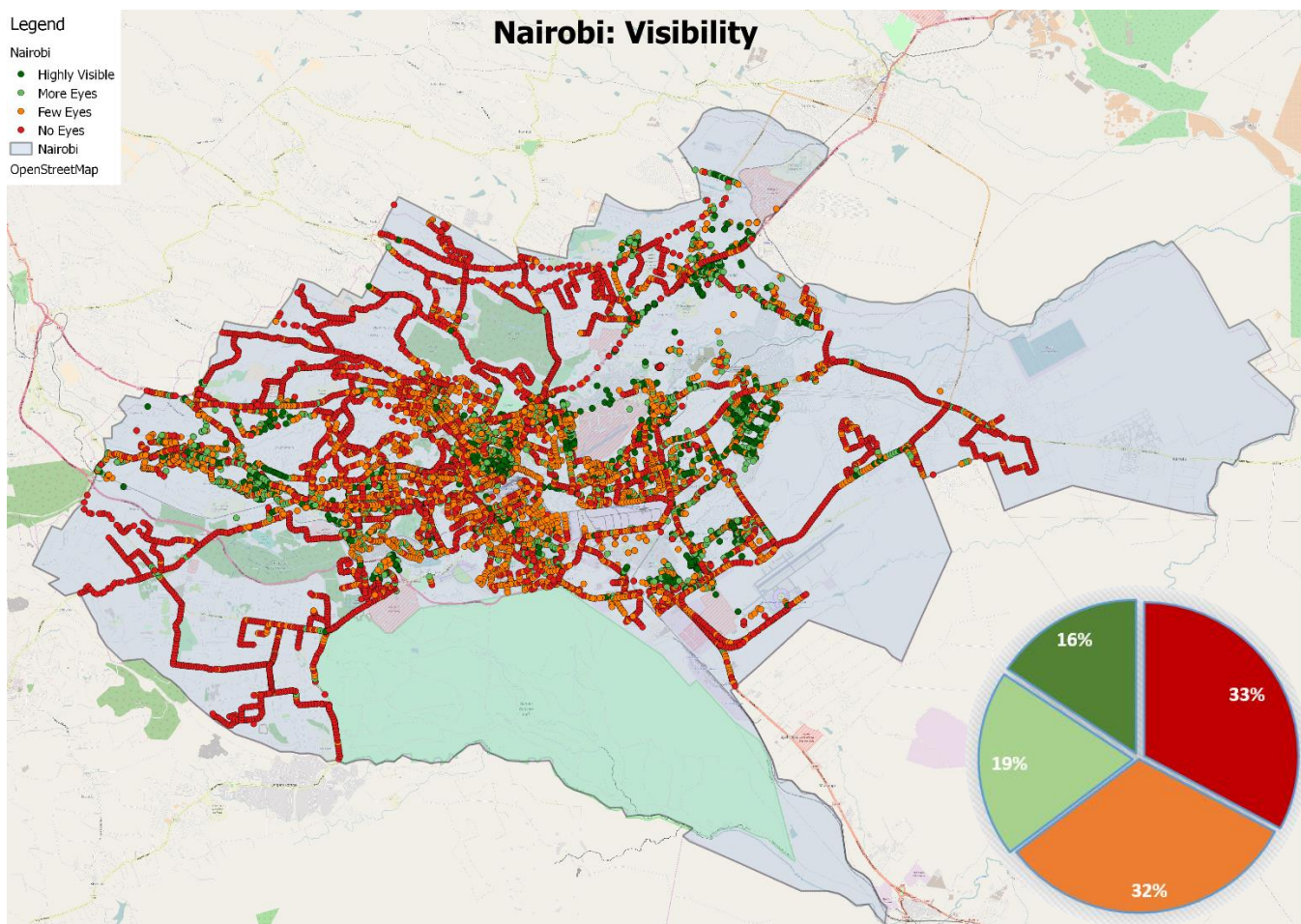
## Nairobi: Public Transport



### Legend

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

## Nairobi: Visibility





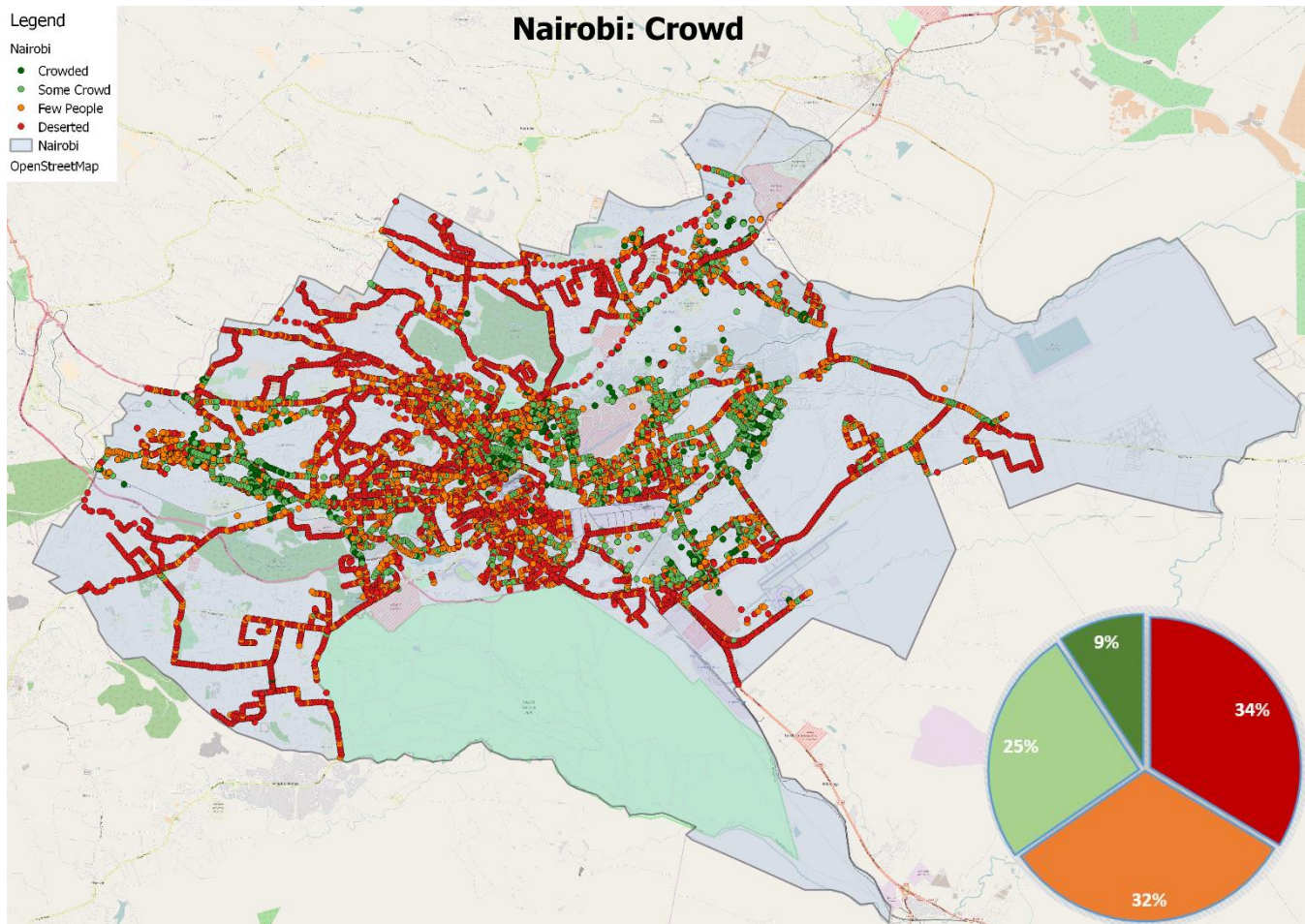
### Legend

Nairobi

- Crowded
- Some Crowd
- Few People
- Deserted
- Nairobi

OpenStreetMap

## Nairobi: Crowd



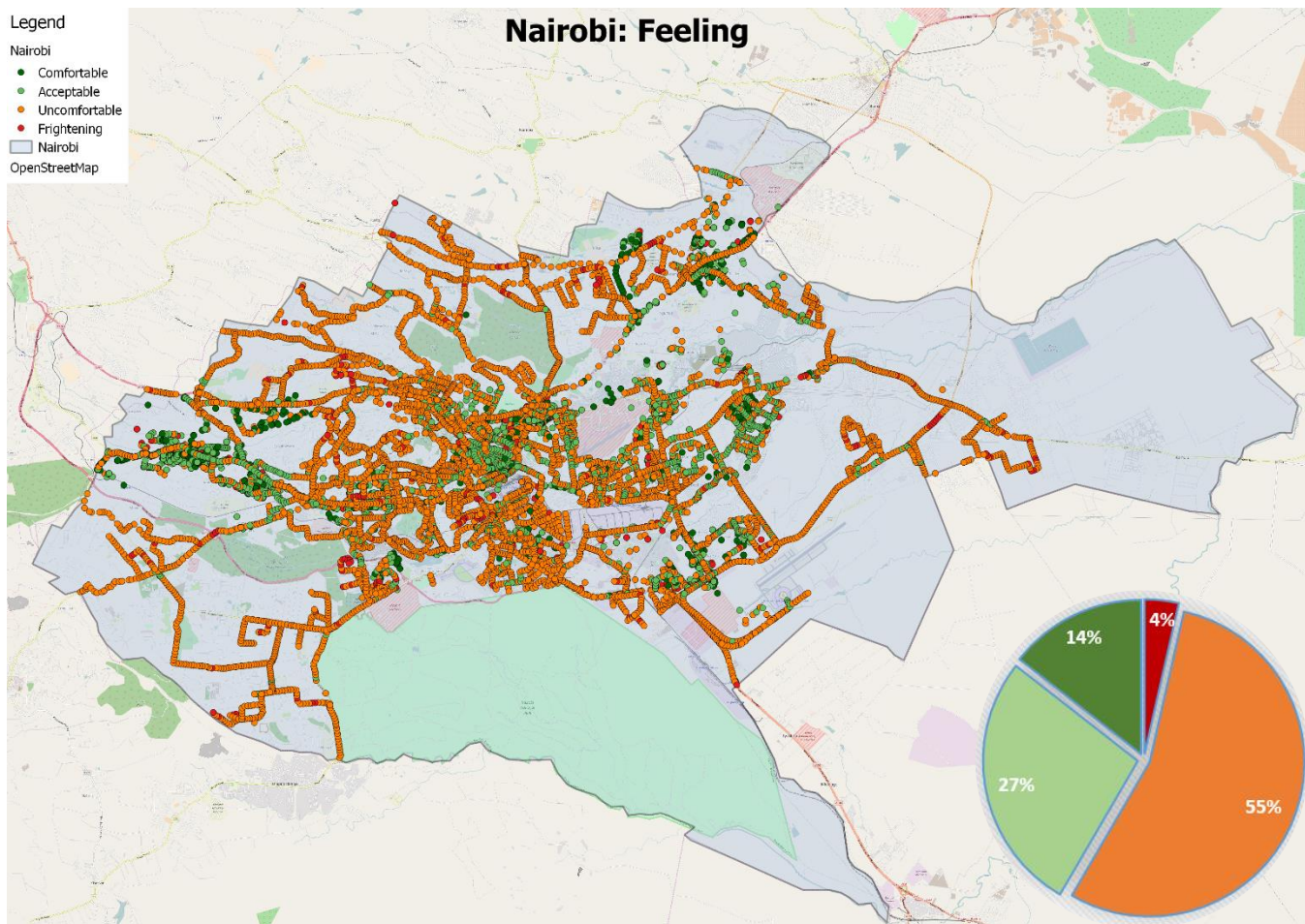
### Legend

Nairobi

- Comfortable
- Acceptable
- Uncomfortable
- Frightening
- Nairobi

OpenStreetMap

## Nairobi: Feeling



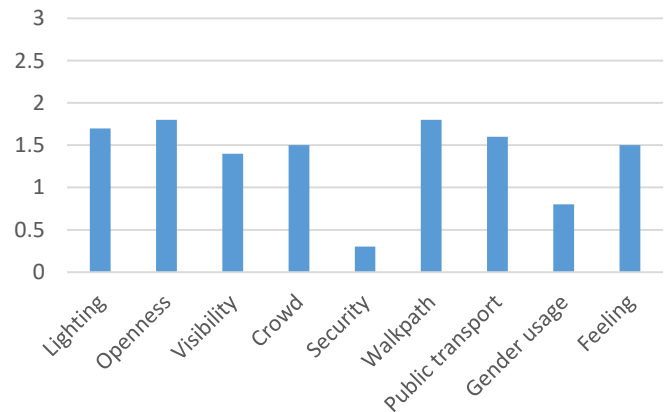




# EASTLEIGH

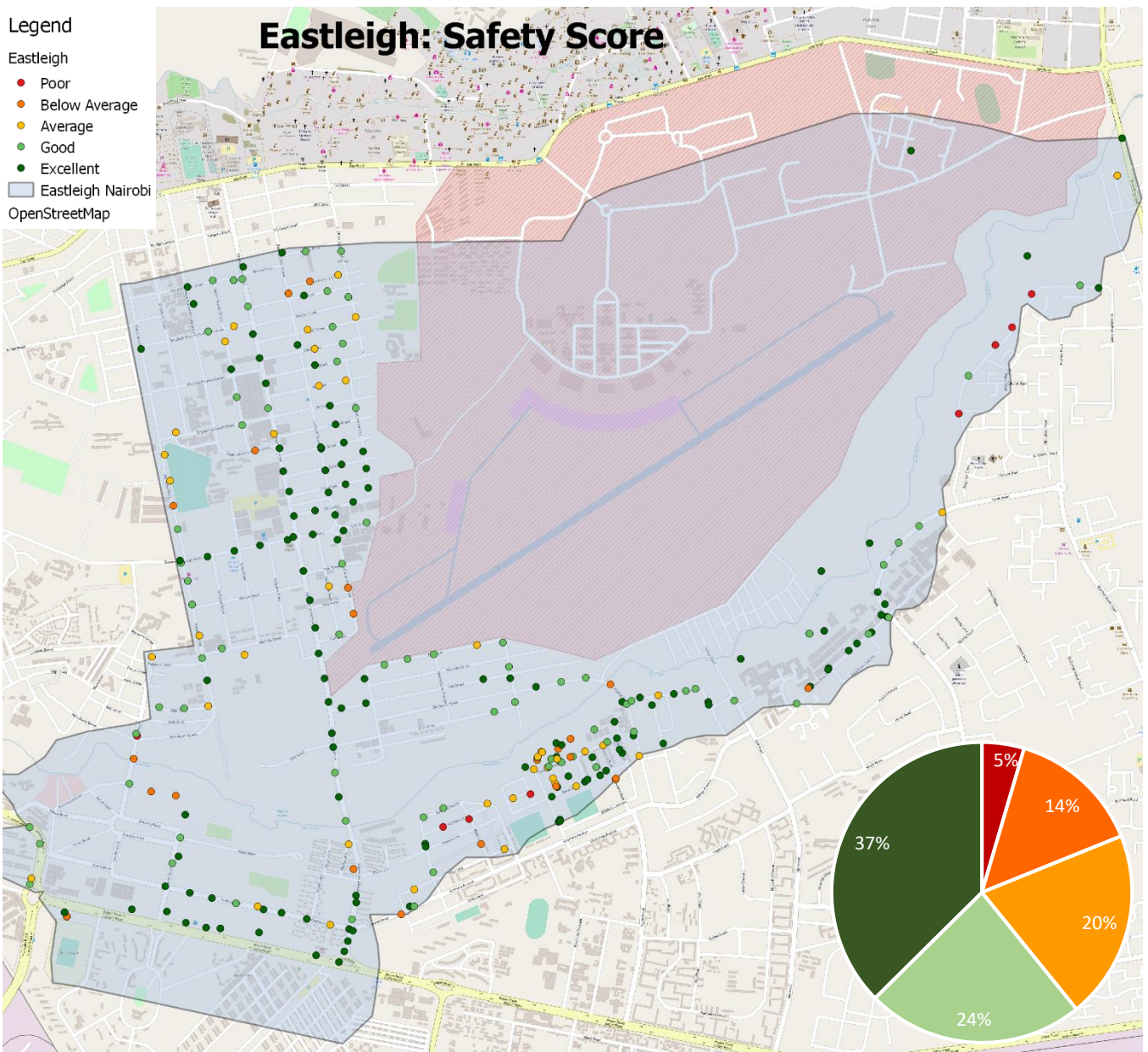
Safety Score: 3.3/5

Eastleigh is a suburb of Nairobi. It is located east of the central business district. A total of 286 audit pins have been generated for Eastleigh. Lighting, Openness, People, and Walkpath are rated Above Average; and Visibility, Security, Public Transport and Gender Usage being rated Average. The overall feeling of safety has been rated Above Average in this area.



## Legend

- Eastleigh
- Poor
  - Below Average
  - Average
  - Good
  - Excellent
- Eastleigh Nairobi  
OpenStreetMap





# Lighting Rating

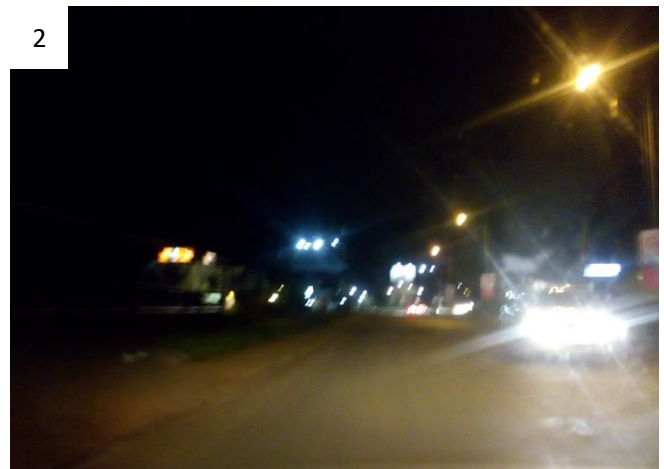
1.7 / 3

Lighting in Eastleigh has been rated 1.7/3 i.e. Average. At some points as seen in Pic 1, there were no streetlights. Some audit points were found to have poor lighting due to streetlights being inoperative or hidden behind trees' leaves. Street lights should be installed in areas where there aren't any along with regular maintenance checks to ensure their proper functioning.

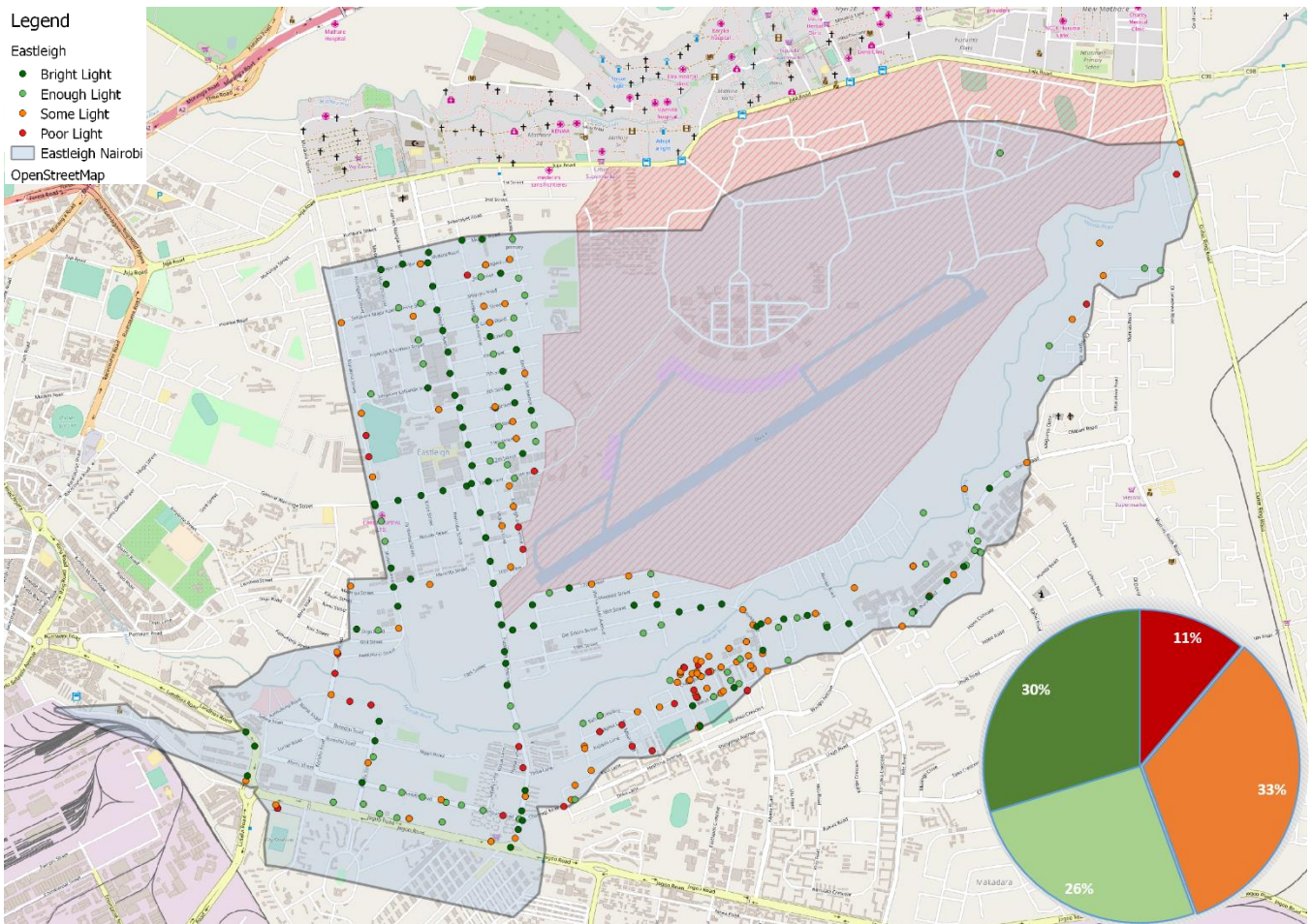
Lighting has maximum contribution to the feeling of safety for the pedestrians. As seen in Pic 2, the streetlights installed along one side of the road, results in well-lit roads but poorly lit footpath. Pedestrian scale streetlights should be installed on the footpath for the pedestrians. They should be installed along the edge of the footpath, clear of any obstruction.



The stretch with no streetlights



Streetlights on one side

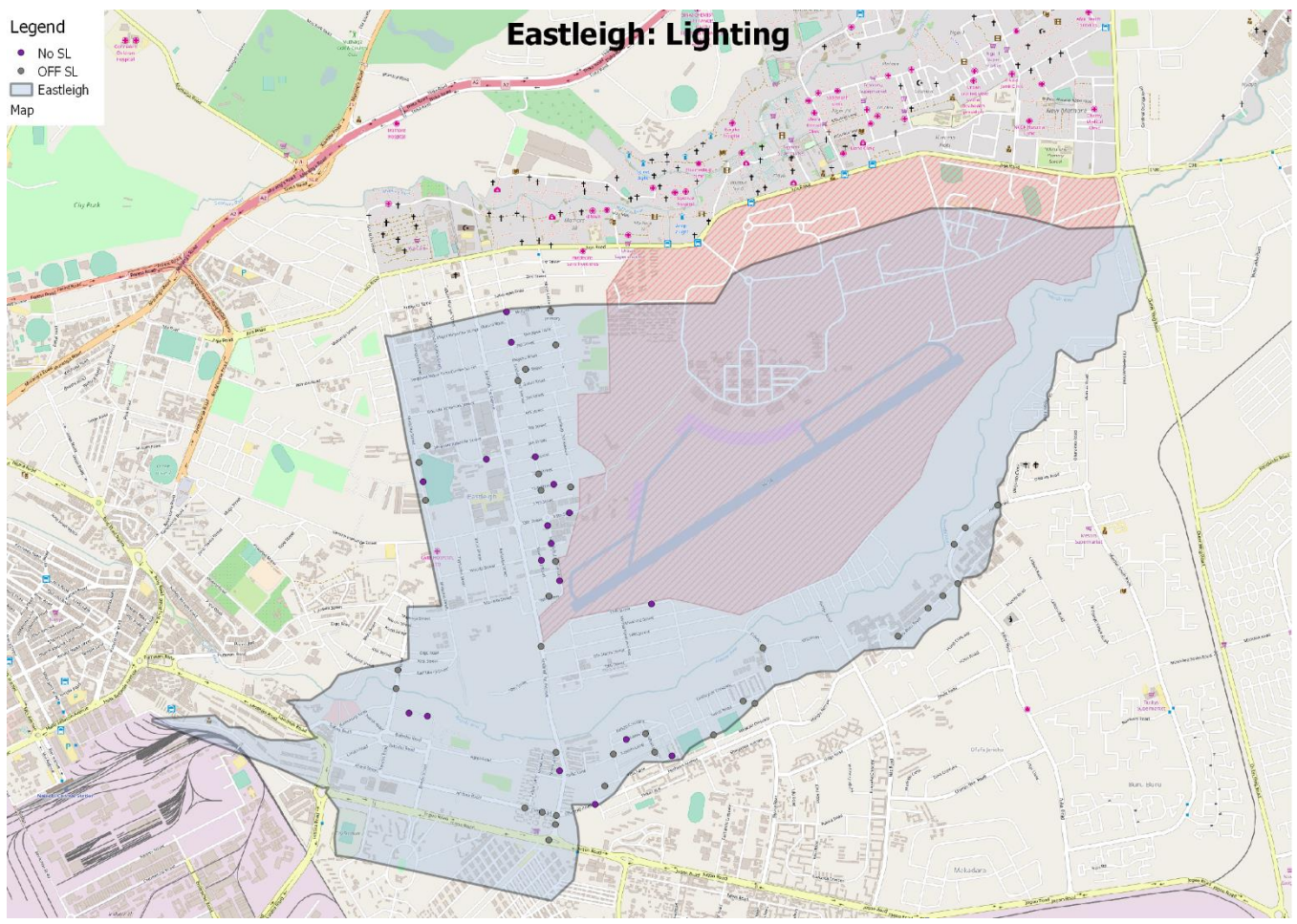


Map indicating Lighting Rating



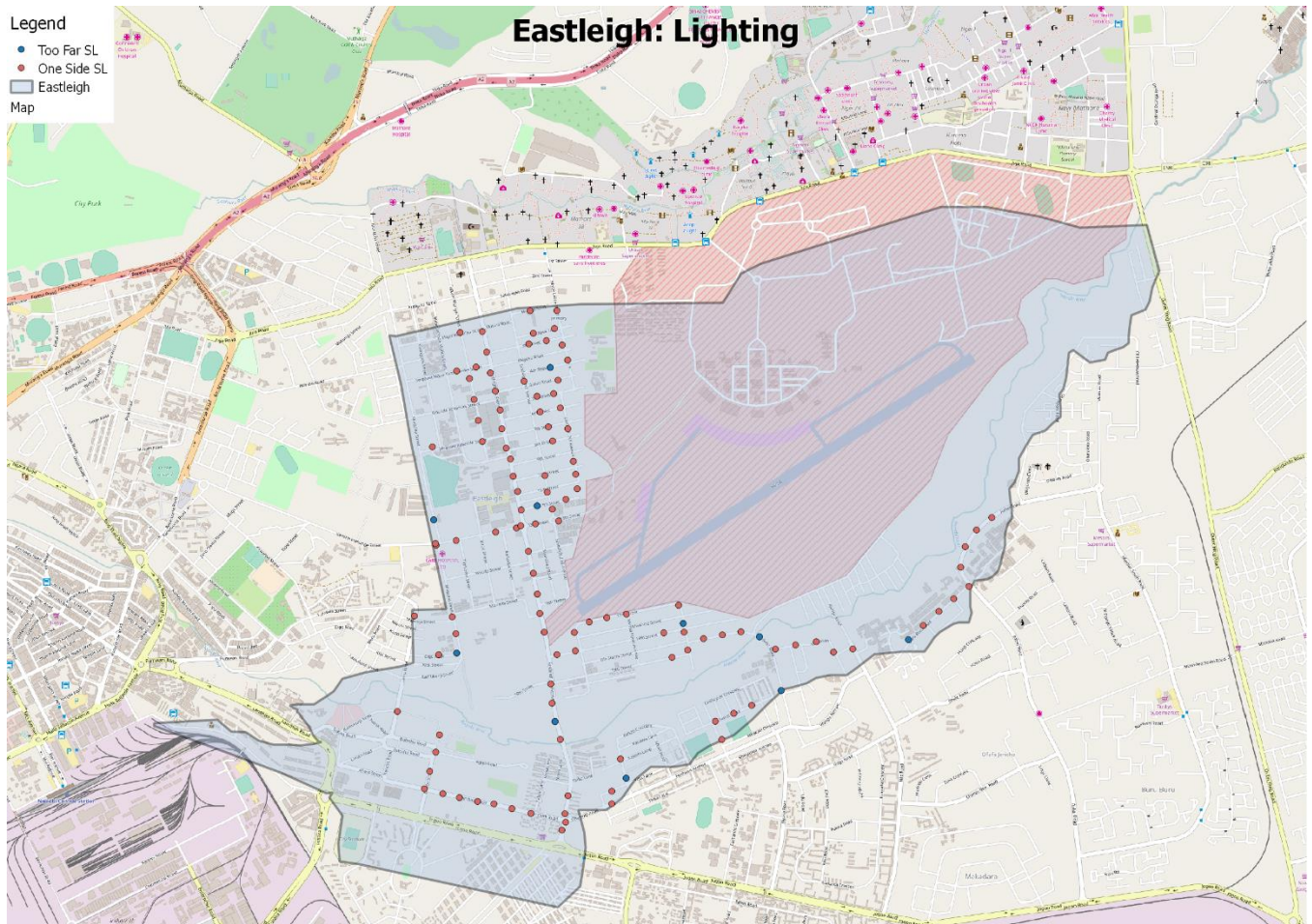
- Legend
- No SL
  - OFF SL
  - Eastleigh
- Map

## Eastleigh: Lighting



- Legend
- Too Far SL
  - One Side SL
  - Eastleigh
- Map

## Eastleigh: Lighting





# Walkpath Rating

1.8 / 3

Walkpath in Eastleigh has been rated 1.8/3 i.e. Average. At some audit points as seen in Pic 1, unpaved pavement exists. The existing unpaved pavement should be paved and maintained to ensure smooth movement for the pedestrians.

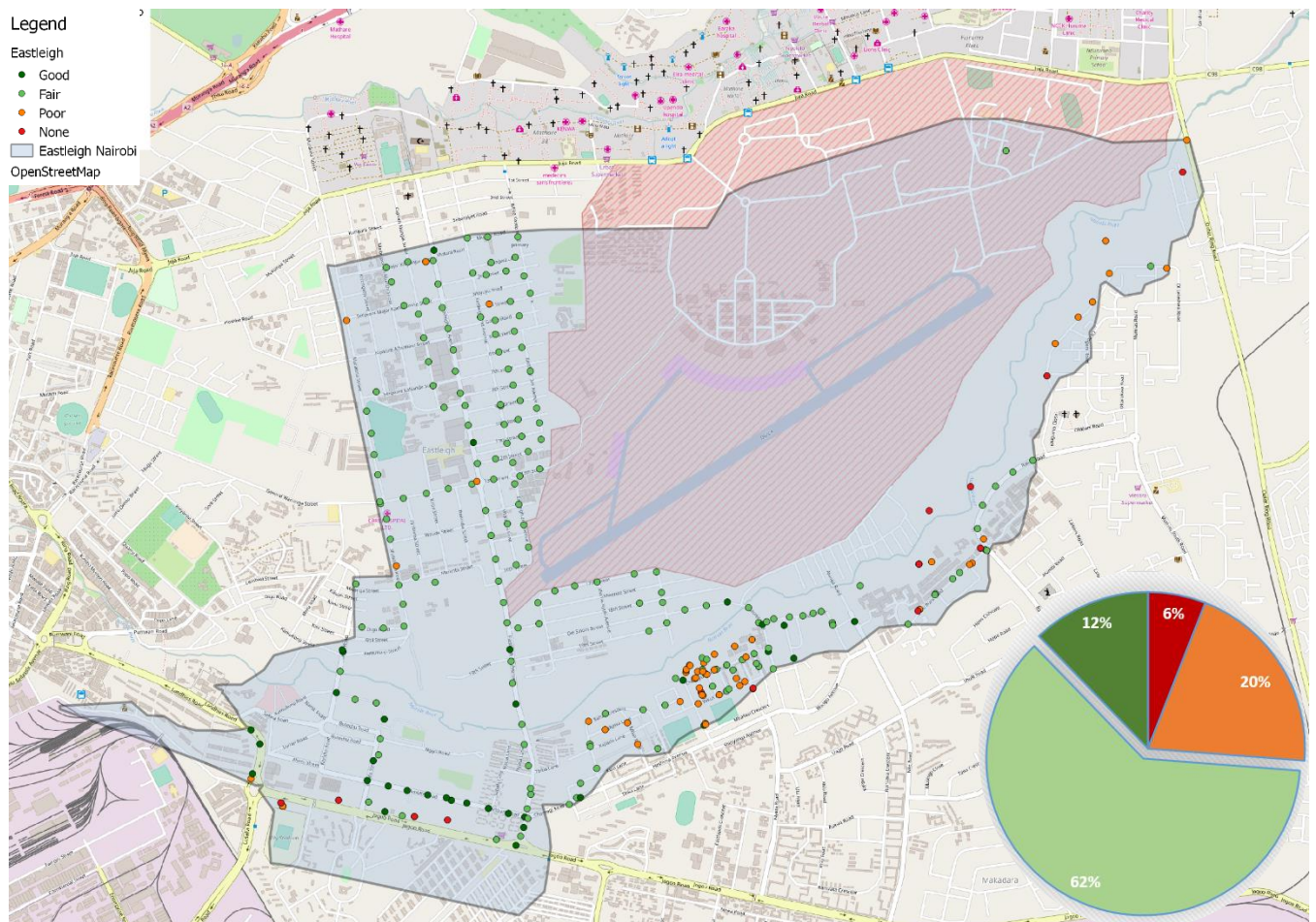
At points as seen in Pic 2, some audit points have car blocking on the walkpath thereby disrupting the pedestrian movement. To prevent vehicles from accessing the footpath, the footpath should be raised at a level from the road.



Some stretches have unpaved pavement



Car Blocking on footpath

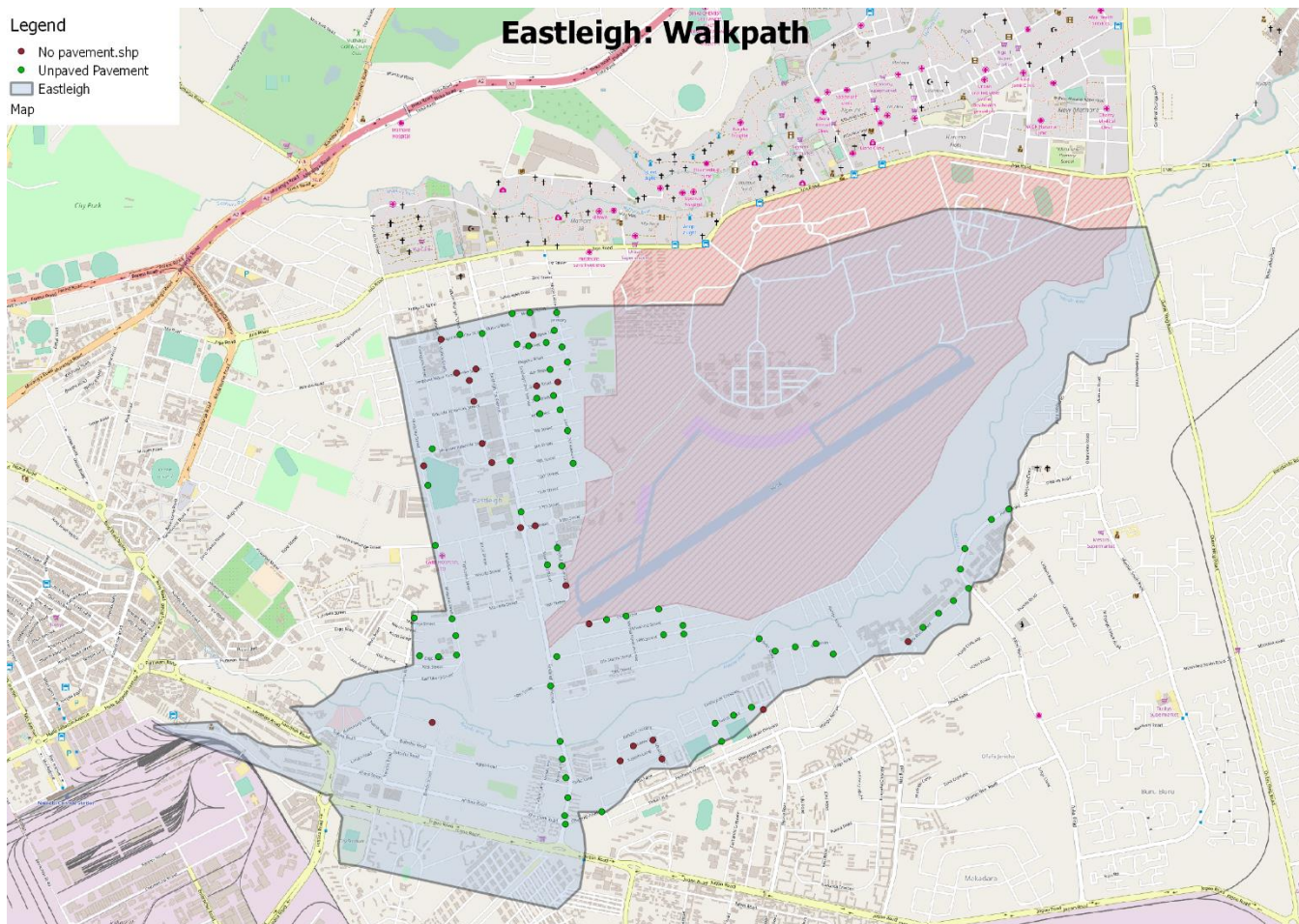


Map indicating Walkpath Rating



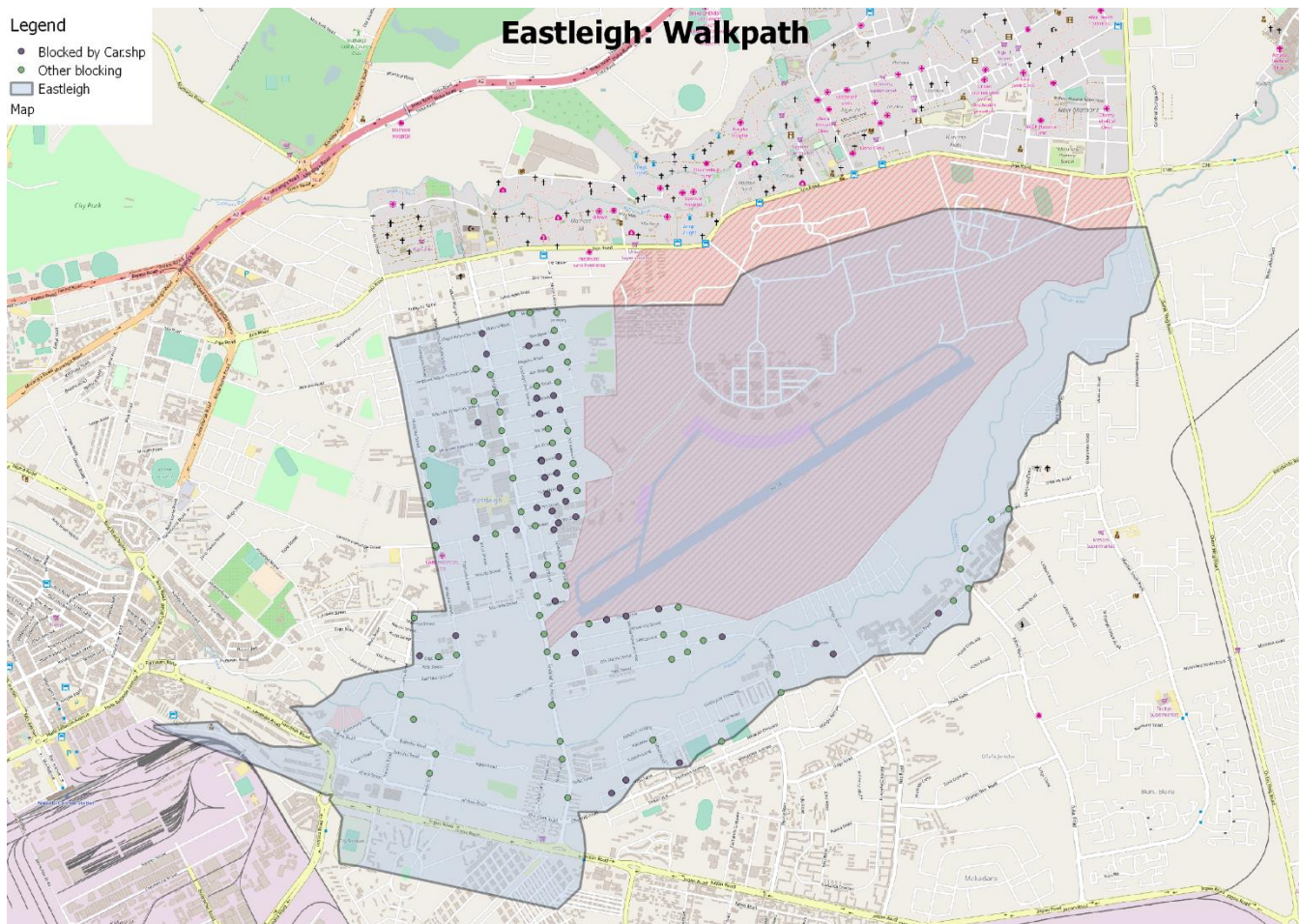
- Legend**
- No pavement.shp
  - Unpaved Pavement
  - Eastleigh
- Map

## Eastleigh: Walkpath



- Legend**
- Blocked by Carshp
  - Other blocking
  - Eastleigh
- Map

## Eastleigh: Walkpath





# Visibility Rating

1.4 / 3

Visibility in Eastleigh has been rated 1.4/3 i.e. Average. As seen in Pic 1, most of the audit points have high boundary walls resulting in poor visibility. The “eyes on street” were found to be low with boundary walls creating a physical division between the pedestrians and the residents behind the walls.

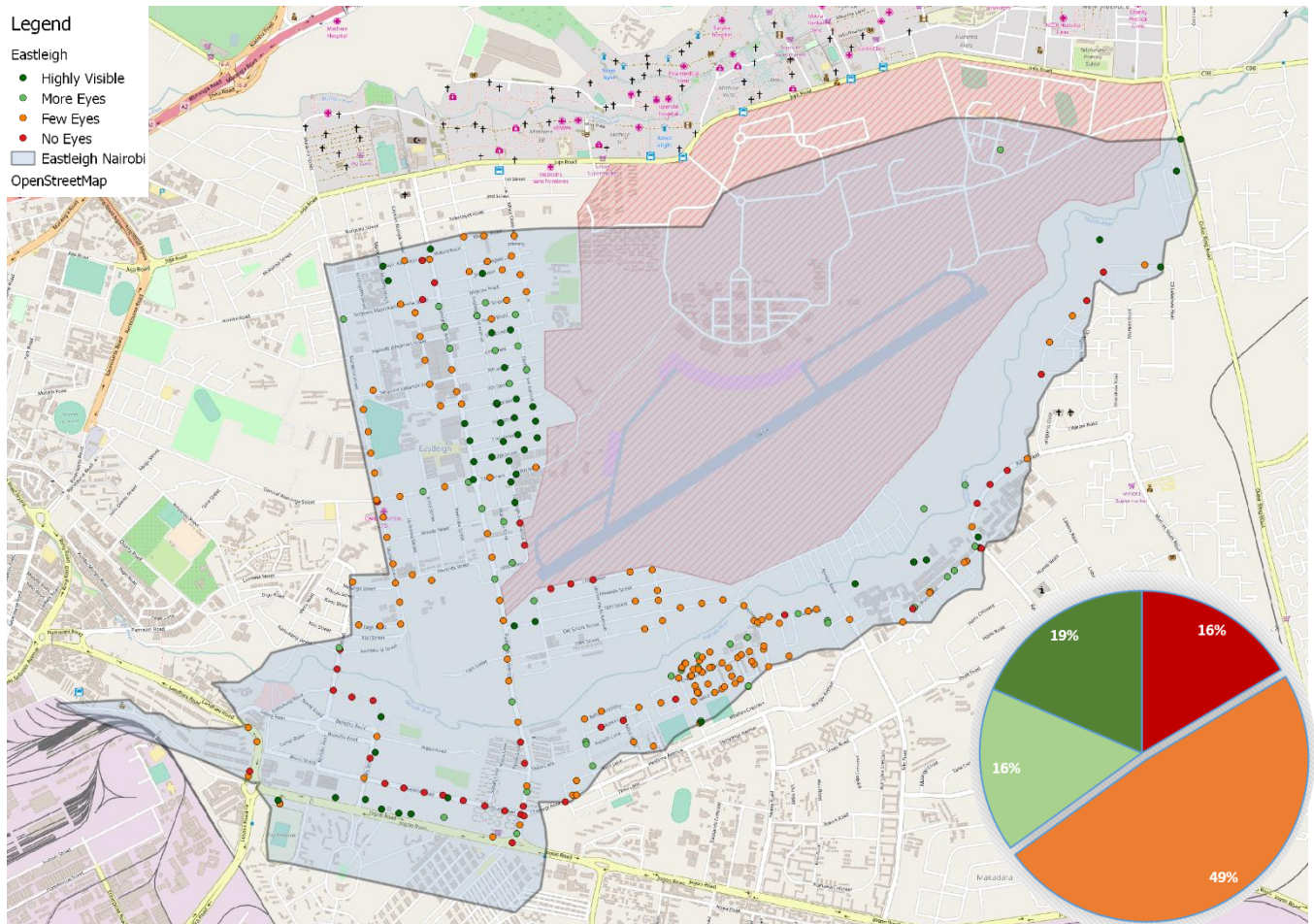
At some points, street side vendors and temporary shops were found acting as natural surveillance (Pic 2). To improve visibility, the height of solid part of the boundary wall should be reduced. Also at places where there are street vendors present, designated spaces should be made for them, clear of the pedestrians’ path.



Boundary wall leads to poor visibility



Temporary stalls and vendors offer some visibility



Map indicating Visibility Rating

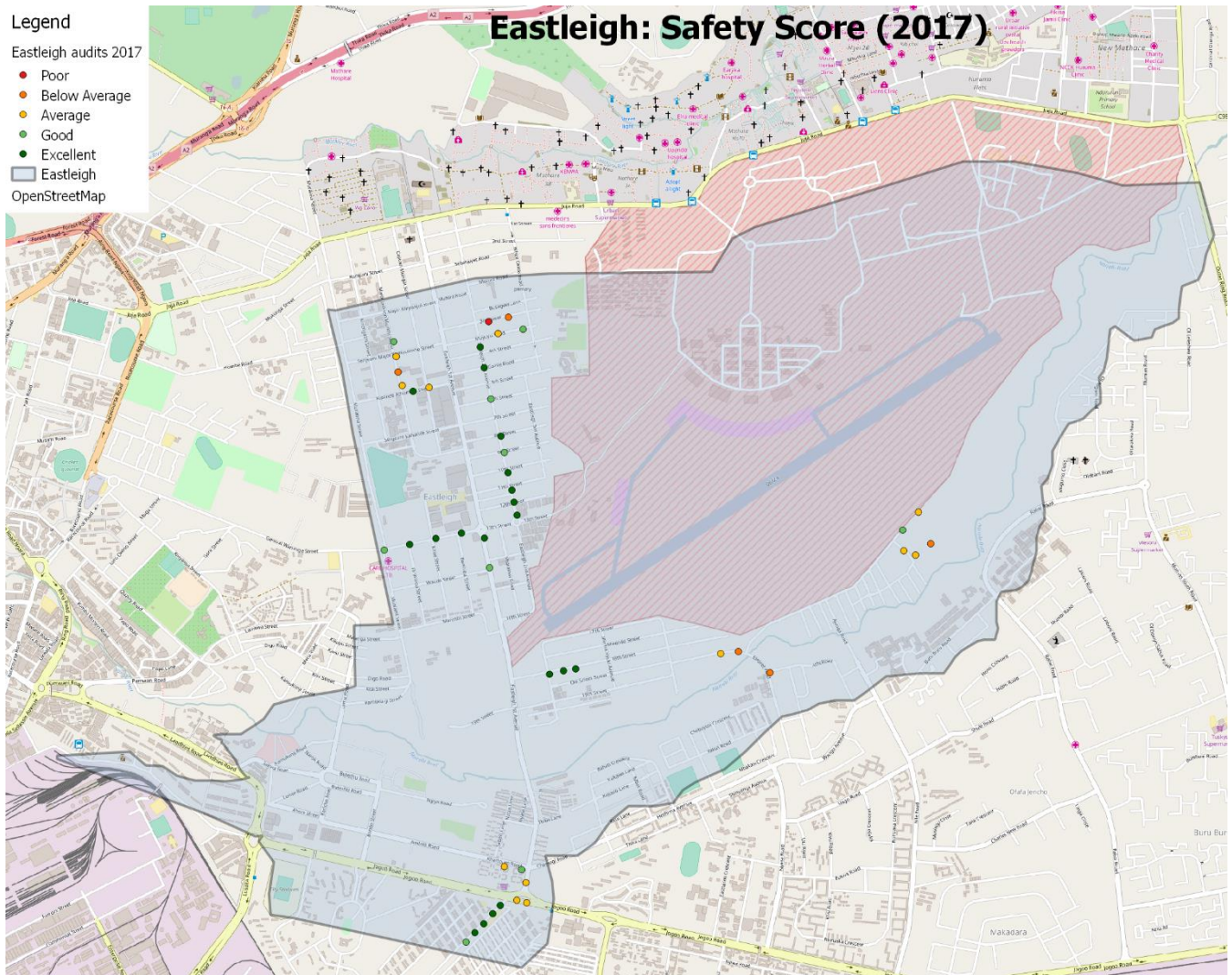


## Phase II

Nairobi City County used Safetipin data for their ongoing and proposed projects. They identified two neighbourhoods namely 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 revitalizing the neighbourhood. The initiatives and projects planned are:

- Improving lighting:  
Installing new lights for uniform illumination.
- Improving Road infrastructure:  
Constructing properly paved footpaths for smooth pedestrian movement.
- Solid Waste Management  
Proper waste management and clearing old vehicles that are lying around the neighbourhood.
- Improving Public Transport  
Introducing new bus terminals and traffic circulation to be re-worked.

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





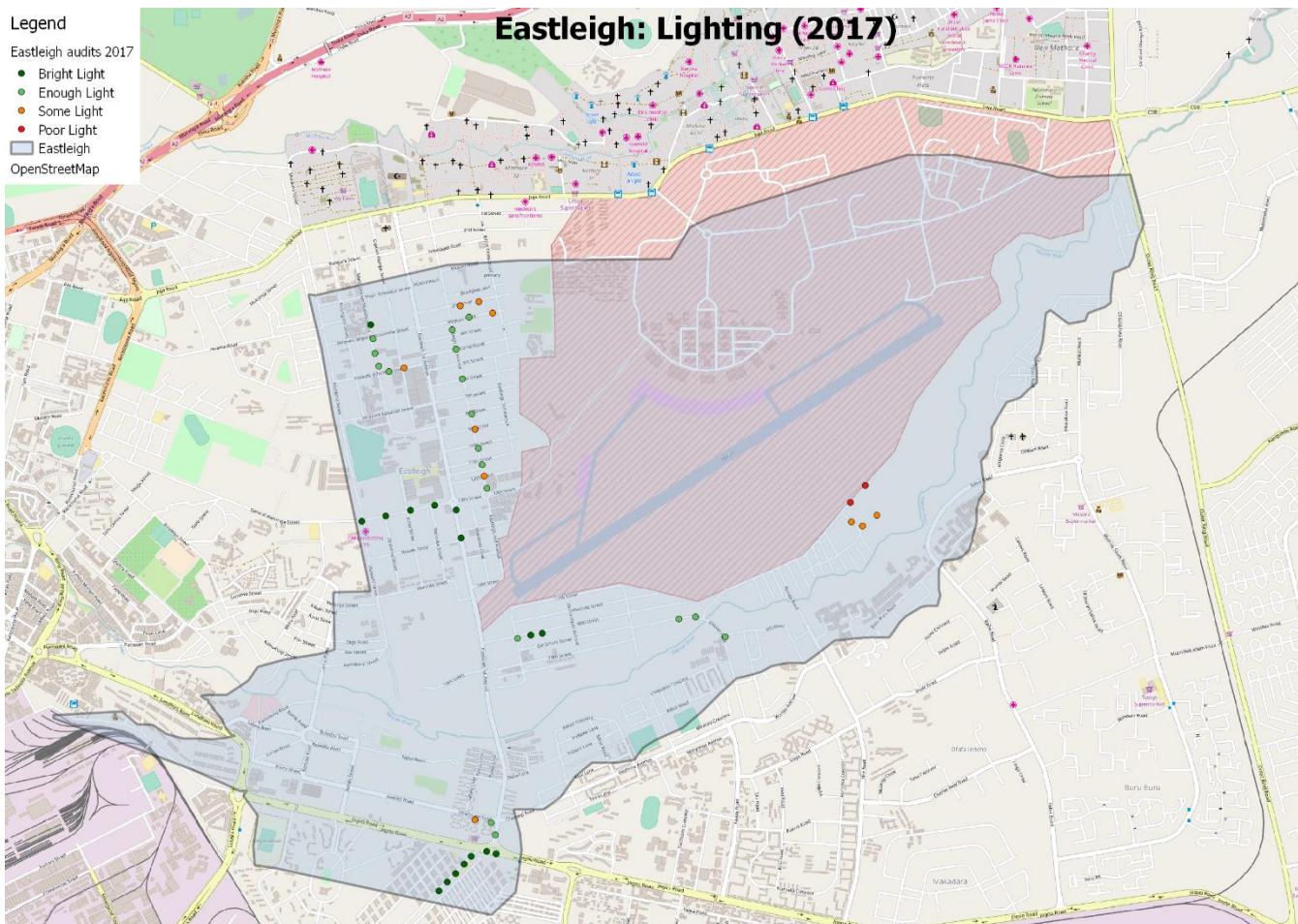
## Legend

Eastleigh audits 2017

- Bright Light
- Enough Light
- Some Light
- Poor Light
- Eastleigh

OpenStreetMap

## Eastleigh: Lighting (2017)



## Legend

Eastleigh audits 2017

- Good
- Fair
- Poor
- None
- Eastleigh

OpenStreetMap

## Eastleigh: Walkpath (2017)

