



SAFETY AUDIT DATA TO STRENGTHEN HANOI METRO LINE 3

QUY HOẠCH CHUNG XÂY DỰNG THỦ ĐÔ HÀ NỘI ĐẾN NĂM 2030 VÀ TẦM NHÌN ĐẾN 2050

The Hanoi capital construction master plan to 2030 and vision to 2050

MẠNG LƯỚI TÀU ĐIỆN NGẦM (METRO) ĐƯỜNG SẮT ĐÔ THỊ

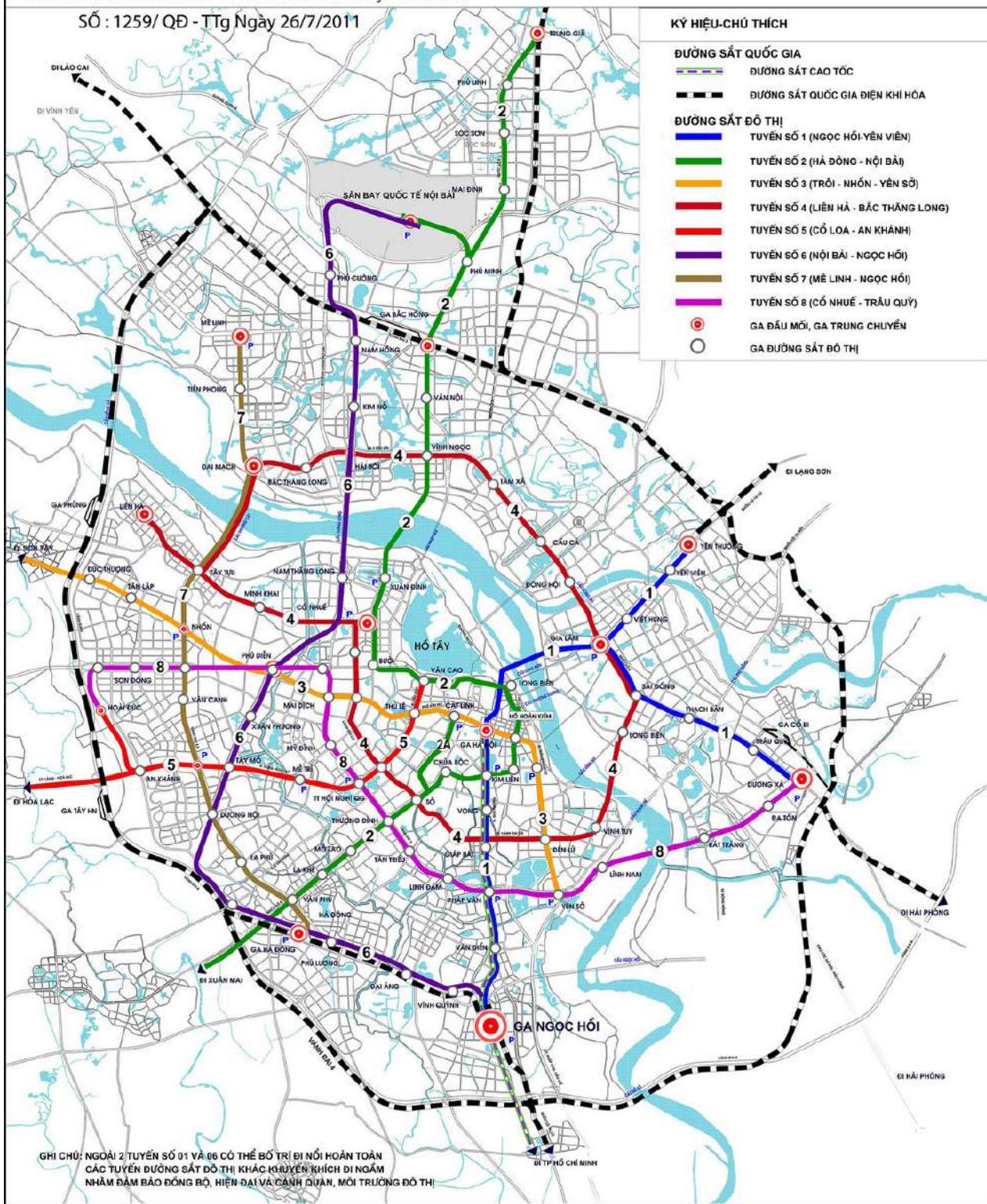
Orientation for metro and urban railway network



SỐ : 1259/ QĐ - TTg Ngày 26/7/2011

KÝ HIỆU-CHÚ THÍCH

- ĐƯỜNG SẮT QUỐC GIA**
- ĐƯỜNG SẮT CAO TỐC
- ĐƯỜNG SẮT QUỐC GIA ĐIỆN KHÍ HÓA
- ĐƯỜNG SẮT ĐÔ THỊ**
- TUYẾN SỐ 1 (NGỌC HỒI - YÊN VIÊN)
- TUYẾN SỐ 2 (HÀ ĐÔNG - NỘI BÀI)
- TUYẾN SỐ 3 (TRÔI - NHỒN - YÊN SỜ)
- TUYẾN SỐ 4 (LIÊN HẠ - BẮC THĂNG LONG)
- TUYẾN SỐ 5 (CỔ LOA - AN KHÁNH)
- TUYẾN SỐ 6 (NỘI BÀI - NGỌC HỒI)
- TUYẾN SỐ 7 (MÊ LINH - NGỌC HỒI)
- TUYẾN SỐ 8 (CỔ NHUỆ - TRÁU QUỲ)
- GA ĐẦU MỐI, GA TRUNG CHUYỂN
- GA ĐƯỜNG SẮT ĐÔ THỊ



GHI CHÚ: NGOÀI 2 TUYẾN SỐ 01 VÀ 06 CÓ THỂ BỎ TRÌ ĐI NẾU HOÀN TOÀN CÁC TUYẾN ĐƯỜNG SẮT ĐÔ THỊ KHÁC KHUYẾN KHÍCH ĐI NGẦM NHẪM ĐẢM BẢO ĐỒNG BỘ, HIỆN ĐẠI VÀ CẢNH QUAN, MÔI TRƯỜNG ĐÔ THỊ

Strengthening Sustainable Urban Transport

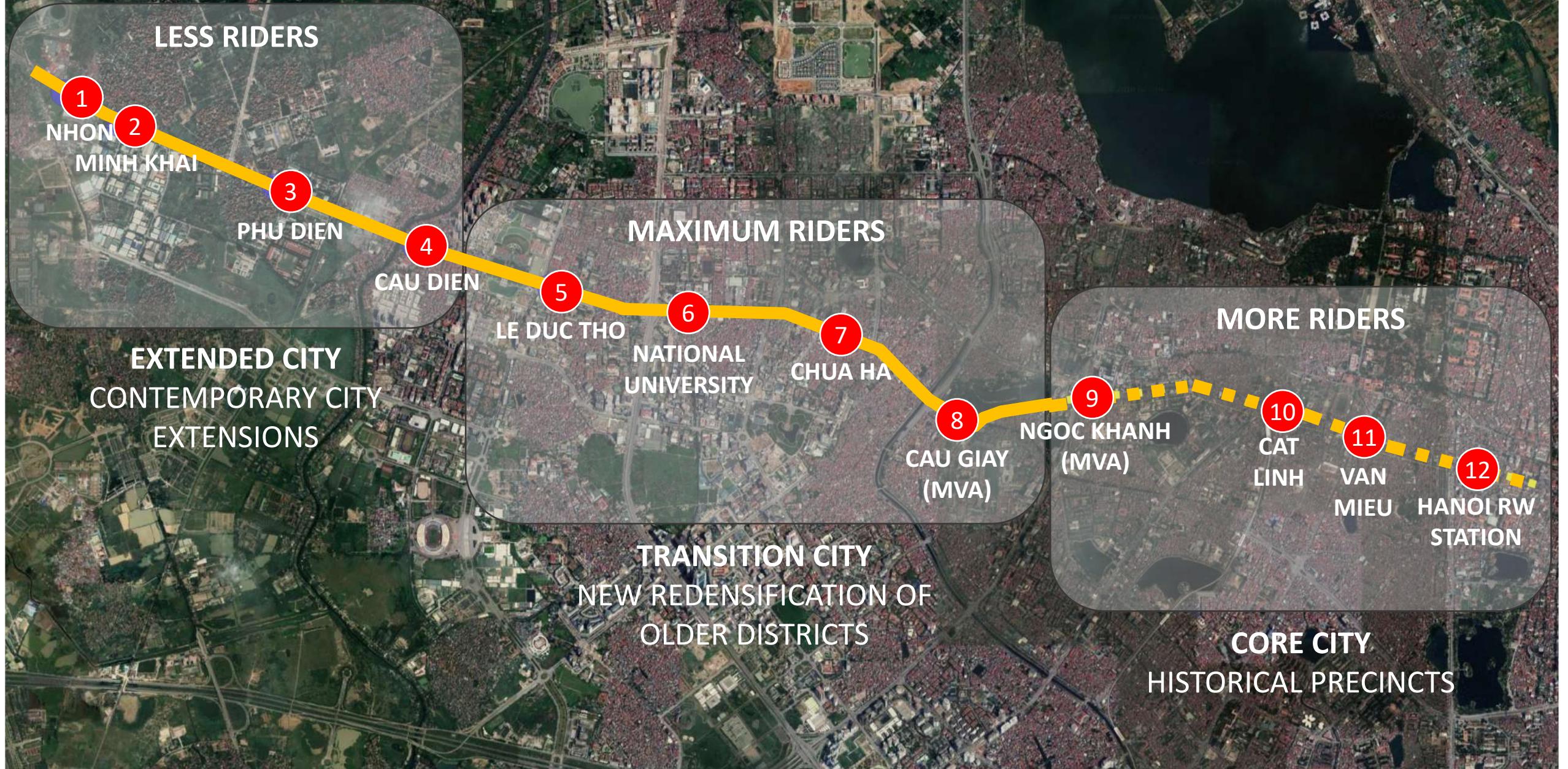
Safetipin in collaboration with the Asian Development Bank Youth for Asia (ADB YfA), a youth initiative aimed at increasing meaningful youth contribution, and AIESEC Viet Nam, a youth led NGO that develops youth leadership - undertook a pilot project for strengthening sustainable urban transport for Hanoi Metro Line 3. The project primarily engages youth to collect gender sensitive safety audits by using both the Safetipin Applications named ‘My Safetipin’ and ‘Safetipin Nite’.

Hanoi Metro Line 3

The country's first metro system consisting of 8 lines to provide connectivity to urban and suburban areas of Hanoi are currently under construction - Line 2A: Cat Linh to Ha Dong and Line 3: Nhon to Hanoi Station - the latter being our project scope. After facing long delays of almost ten years, the elevated section of Line 3 is nearing completion in 2020. Starting the same year, the city wants to slowly phase out bikes and encourage people to use public transport. To enable this paradigm shift, the soon operational metro line is trying to strengthen the last mile connectivity around the stations and focus on safety, accessibility and mobility for all.

Safetipin was brought in to help assess the quality of the urban areas around each stations and to give recommendations for improvement which will specifically benefit women and girls and allow them to use public transport with ease – increased access, last mile connectivity and freedom of movement being the primary objectives for the pilot project.

AN OVERVIEW OF THE HANOI METRO LINE 3 THROUGH THE CITY DISTRICTS





12 STATIONS
AUDITED

500 M
RADIUS AREA

TOTAL PINS
2025

MANUAL
PINS 935

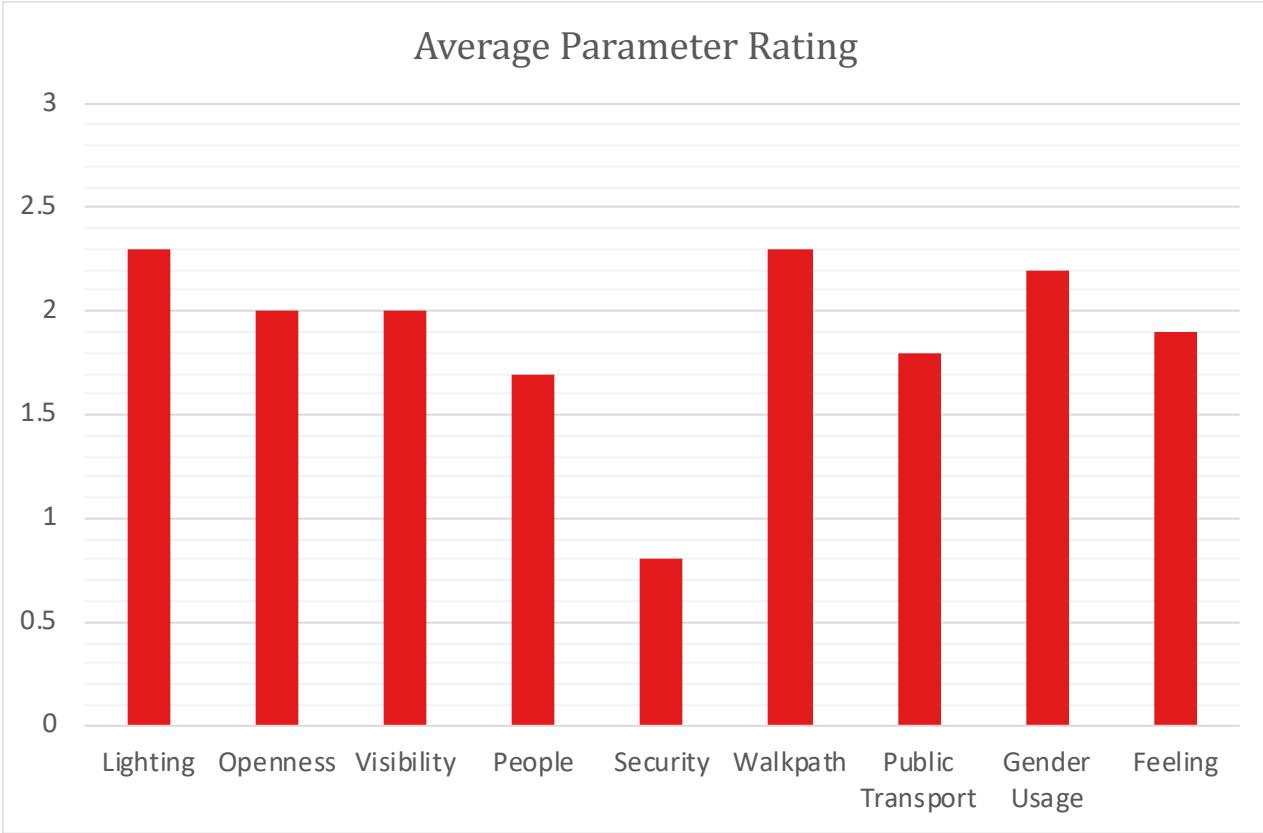
NITE PINS
1090

Safety Audits of Hanoi Metro Line 3

Parameter Rating - Pin Distribution Graph:

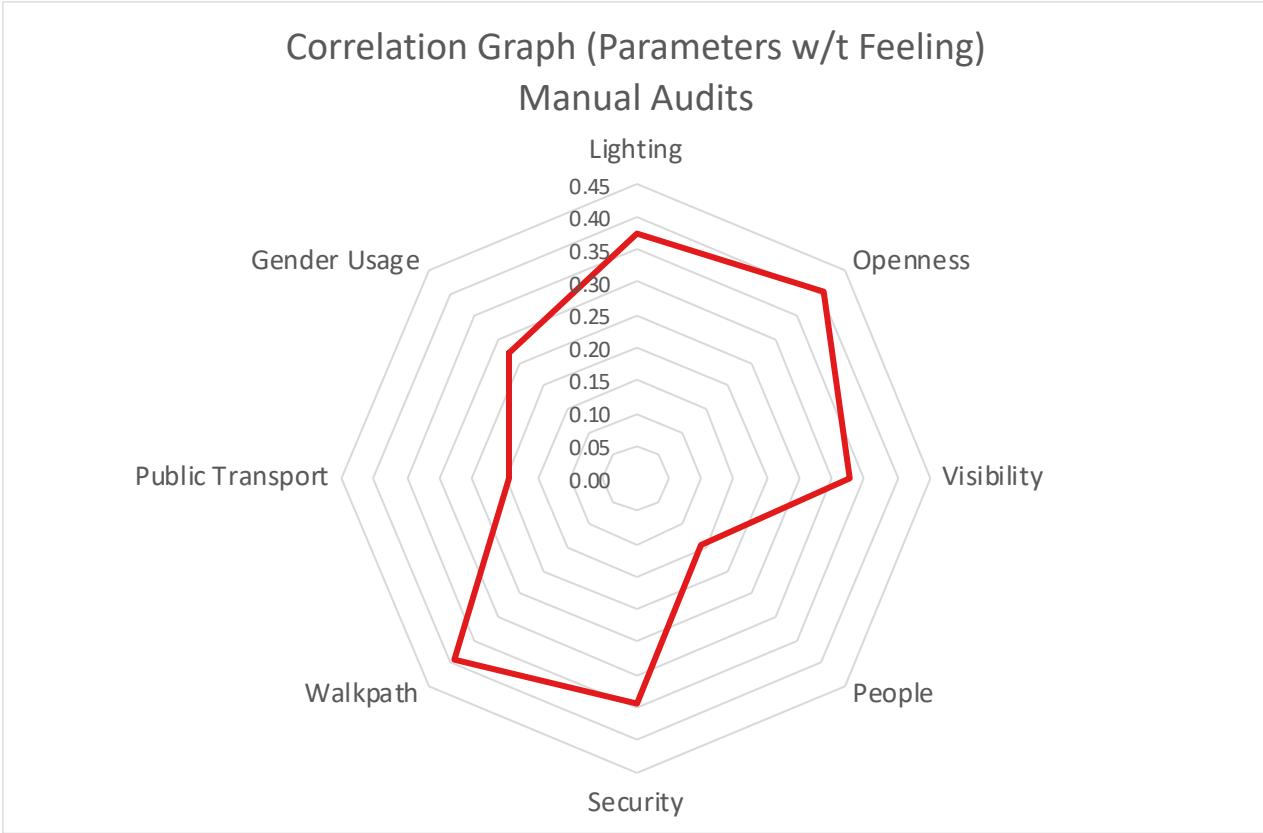
The parameter wise pin distribution graph illustrates the number of points rated as 0, 1, 2 and 3. The good ratings are taken as positive and poor ratings as negative. As shown on the graph, the parameter of Security is rated poorly for most parts of the city, whereas parameters like Walkpath, Lighting and Gender Diversity is mostly good through out the city.





Average Parameter Rating Graph:

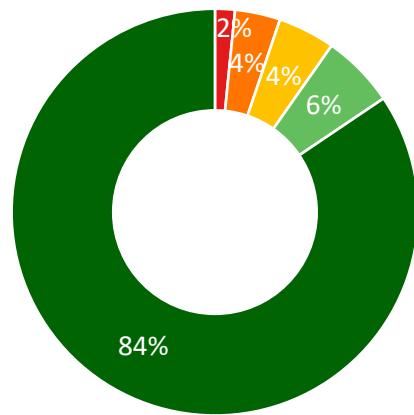
The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0,1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath parameter has been rated the highest, followed by other parameters such as Lighting and Gender Usage. Openness, Visibility and Transport parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for Hanoi is rated Average.



Correlation Graph (Parameter w/t Feeling):

The correlation graph illustrates the correlation drawn between each of the eight parameters with respect to feeling, the ninth parameter. In the case of Hanoi, the manual data collected shows openness, walkpath, security and lighting to be rated the highest when correlated with feeling. This clearly shows the importance of these parameters in contributing to the perception of safety.

Safety Score 4.1/5

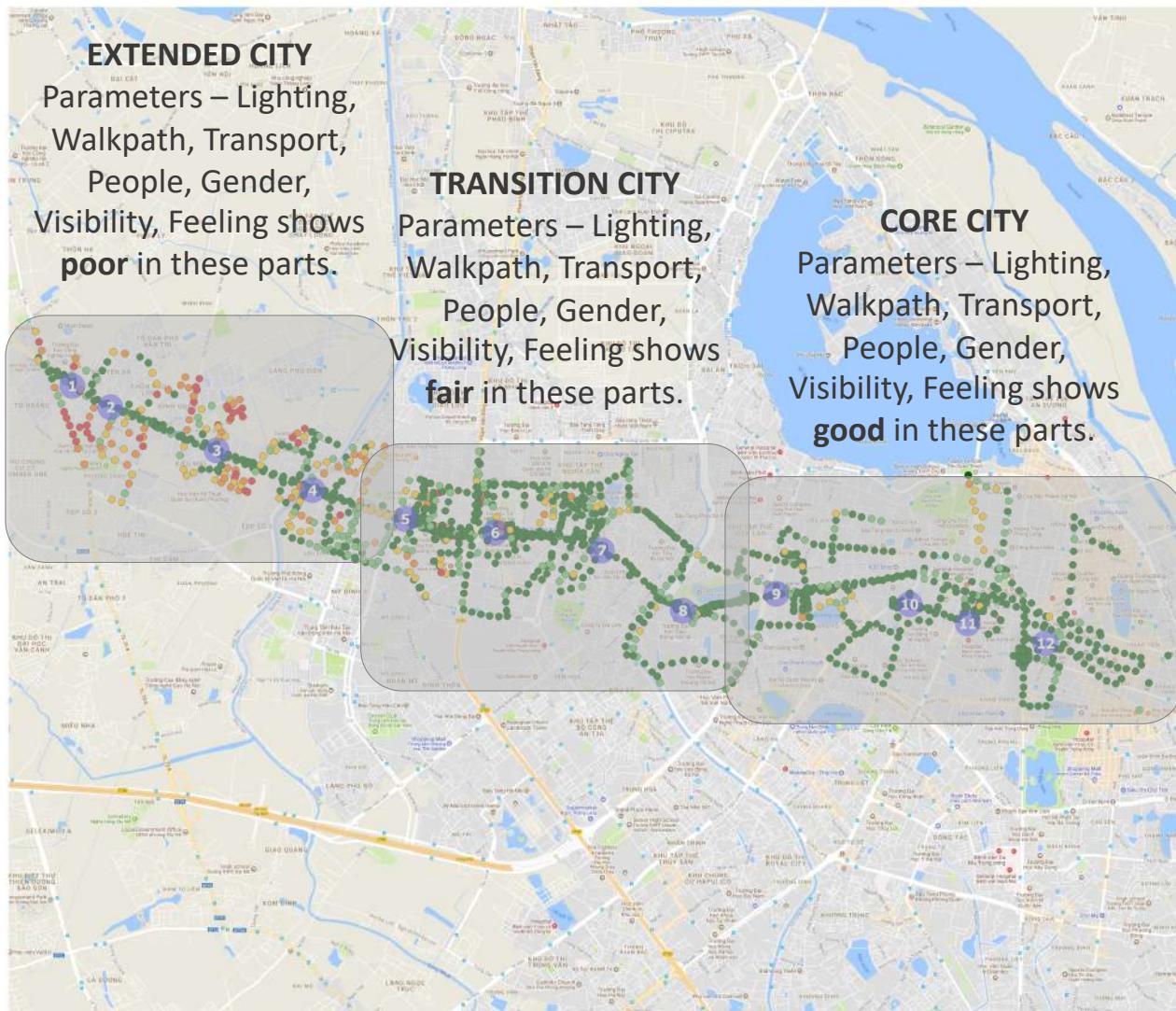


RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	32
Below Average	1.1 - 2.0	73
Average	2.1 - 3.0	92
Above Average	3.1 - 4.0	118
Good	4.1 - 5.0	1710

Hanoi Metro Line 3 Safety Score 4.1/5

Basing on the collected data a safety score of 4.1 on a scale of 5 is given for the entire Hanoi Metro Line 3 (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 84% of the overall rating based on all the nine parameters, to be good. The rest is distributed from above average to poor, where 6% is above average and the remaining 10% is further divided between average, below average, poor.

The following parameter maps illustrate the pin location and rating received by each pin for each parameter. When viewed together it shows predominantly how areas fair based on the ratings. For example, if the safety score map on the left is viewed at a glance, it shows how areas from the extended or outer city fairs poorly in terms of safety score (more red, orange and yellow), compared to the transition or in-between city (mix of all the colours) which is a combination of both good and poor scores. The core or inner city however fairs very good in terms of safety scores (mostly light and dark green). What is really explains at a very basic level, is that neighbourhood which are tightly packed around the streets are safer in nature as they have more people inhabiting the streets. Such streets have more ‘eyes on the streets’ as people are working on or by them (formal shops, informal vendors) and as people are living next to them (houses and hotels) – thus making it safer for users. If physical infrastructure (adequate street lights, accessible walkpaths, seamless public transport) is improved in these neighbourhoods then it has more changes of being safe at all times of day and night compared to the neighbourhoods which lack them.



The parameter maps for lighting, walkpath, public transport, visibility, gender usage shows clearly what the extended or outer parts of the city is lacking compared to the transition and core city. However the parameter map for security is poor throughout the city and the parameter map for openness is good for the city.

Hanoi Metro Line 3 Safety Score 4.1/5

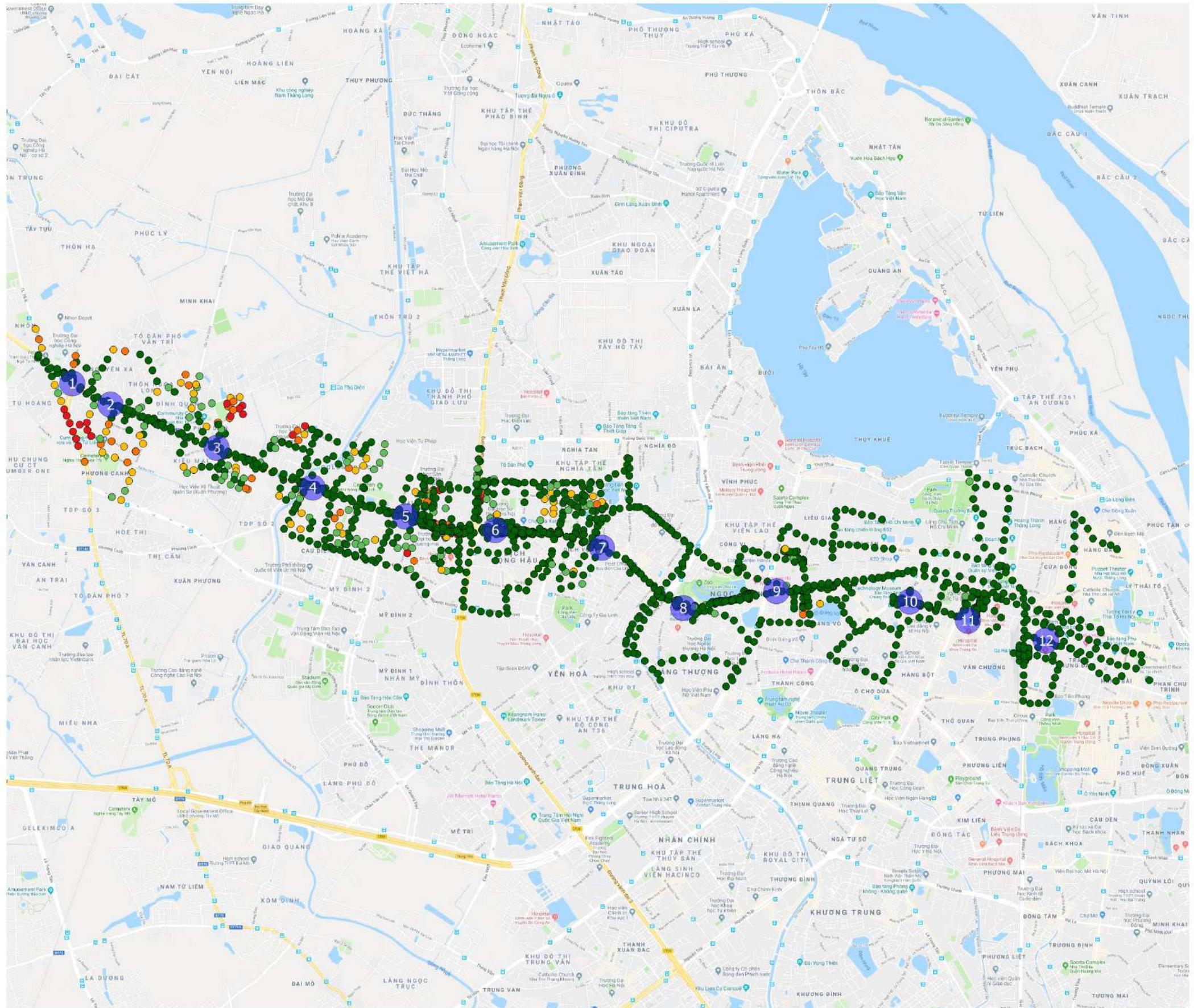
Legend

 Metro Station

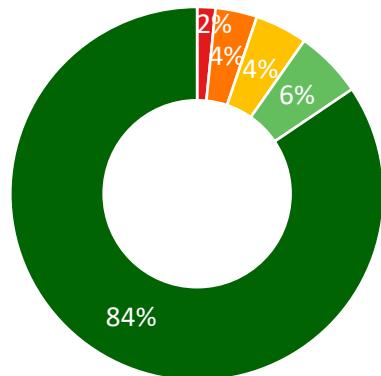
Safety Audits

-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

Base: Google Map



Safety Score 4.1/5



Hanoi Metro Line 3 Parameter: Lighting

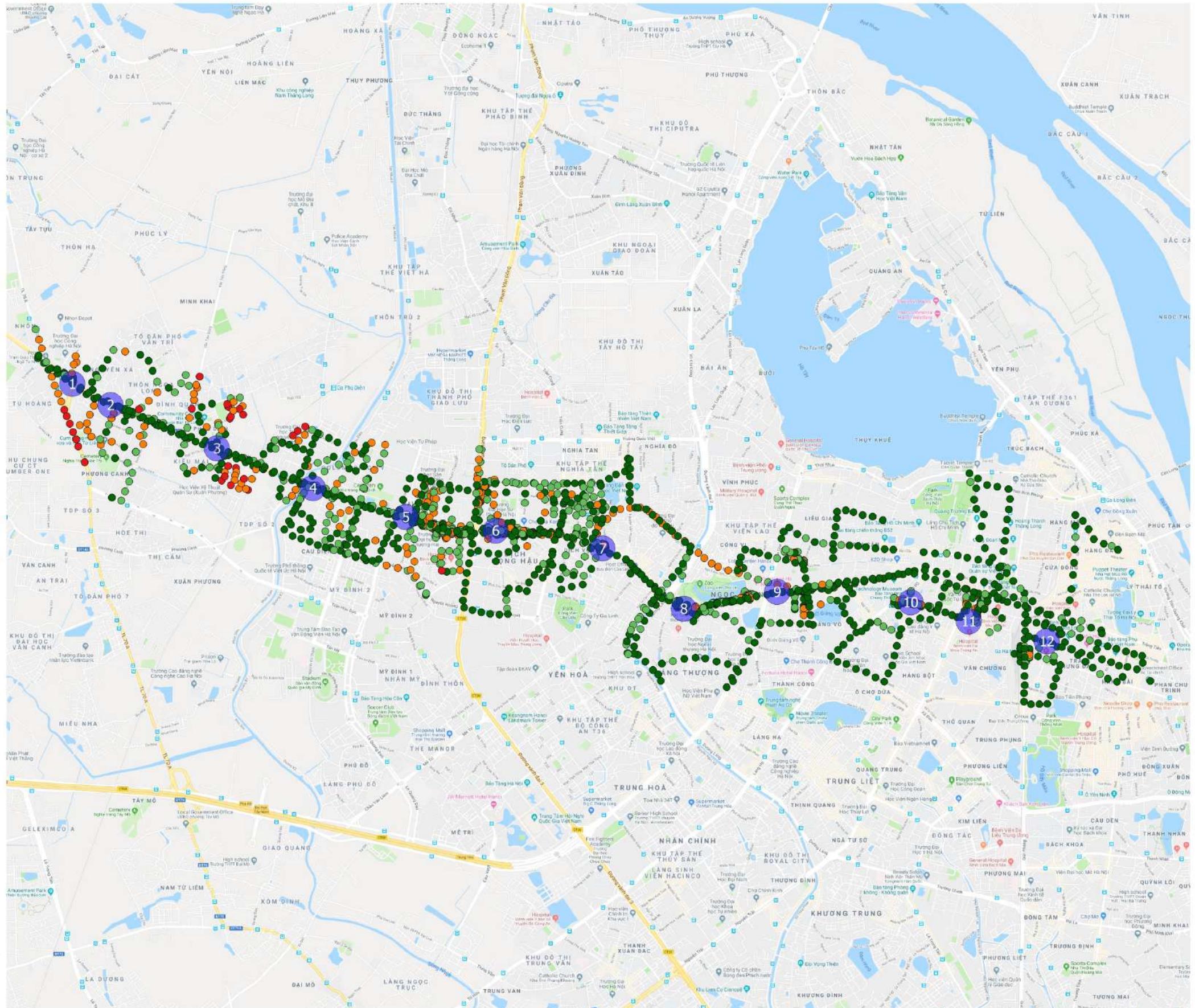
Legend

 Metro Station

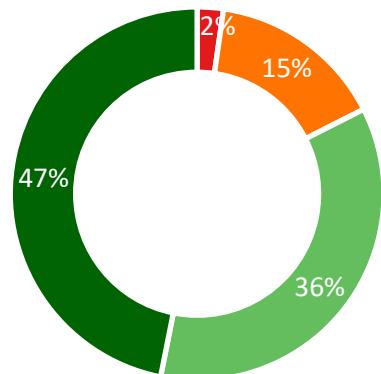
Safety Audits

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

Base: Google Map



Lighting



Hanoi Metro Line 3 Parameter: Walkpath

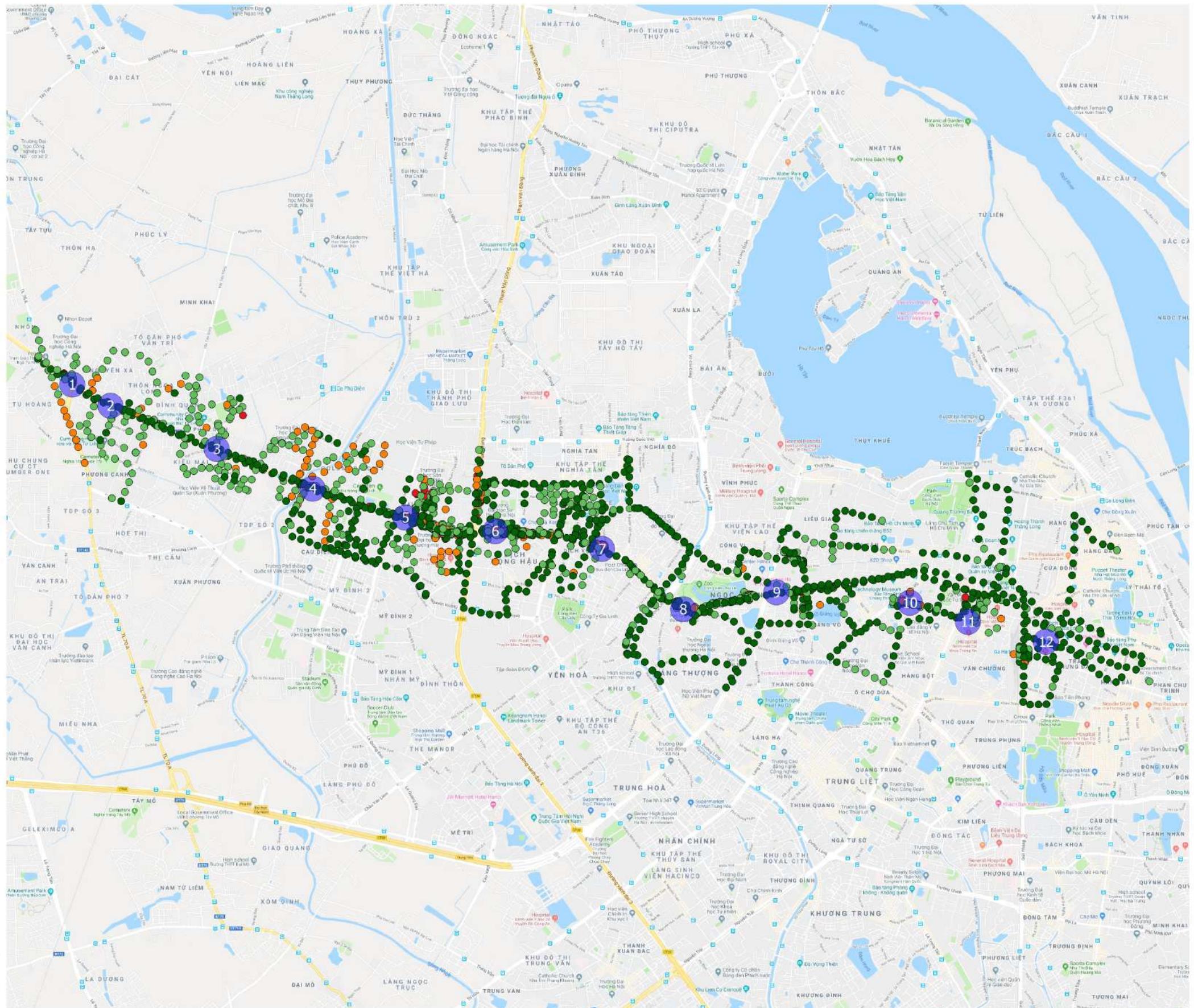
Legend

 Metro Station

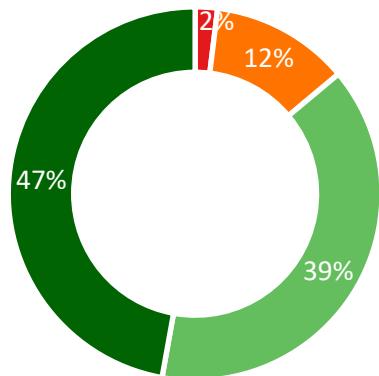
Safety Audits

-  None
-  Poor
-  Fair
-  Good

Base: Google Map



Walkpath



Hanoi Metro Line 3 Parameter: Public Transport

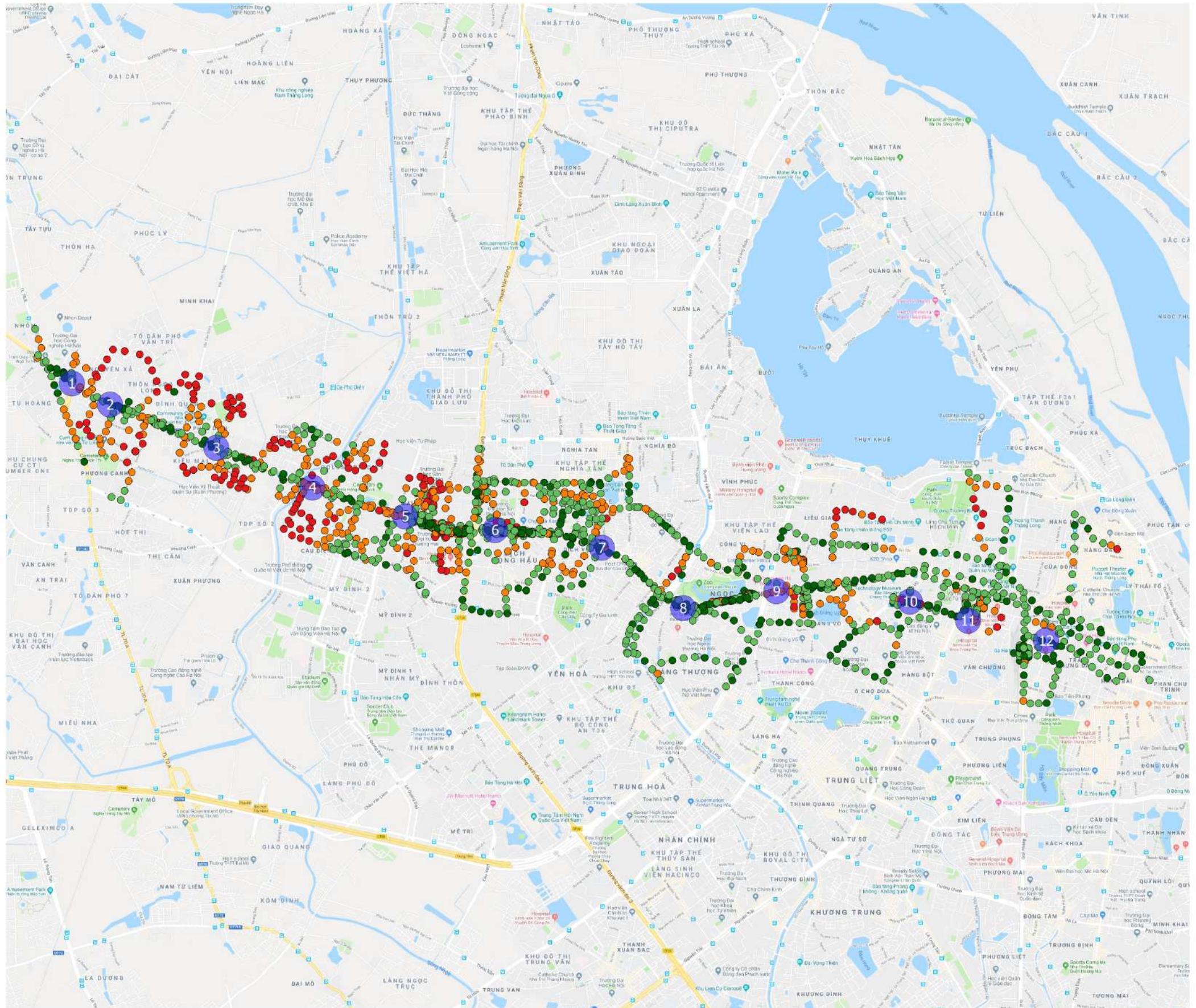
Legend

 Metro Station

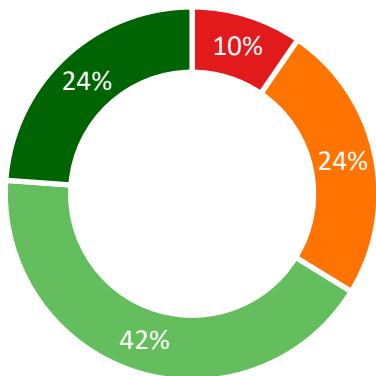
Safety Audits

-  Unavailable
-  Distant
-  Nearby
-  Very Close

Base: Google Map



Transport



Hanoi Metro Line 3 Parameter: Visibility

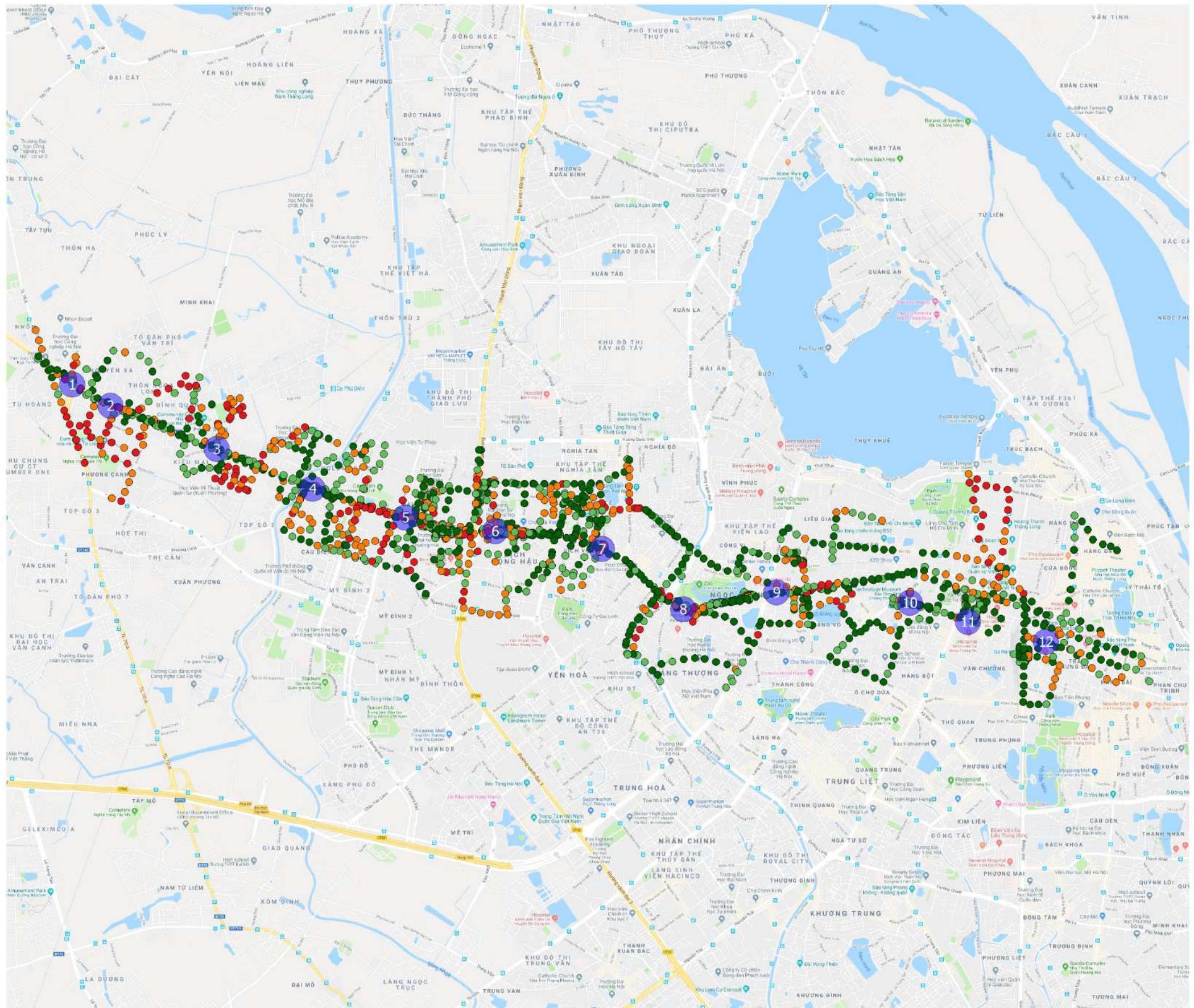
Legend

 Metro Station

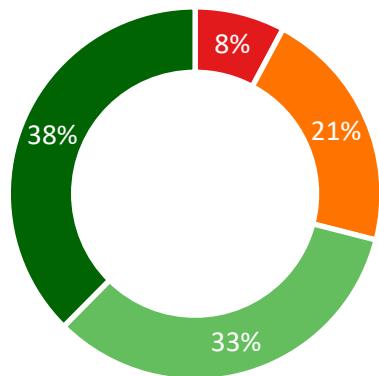
Safety Audits

-  No Eyes
-  Few Eyes
-  More Eyes
-  Highly Visible

Base: Google Map



Visibility



Hanoi Metro Line 3 Parameter: Security

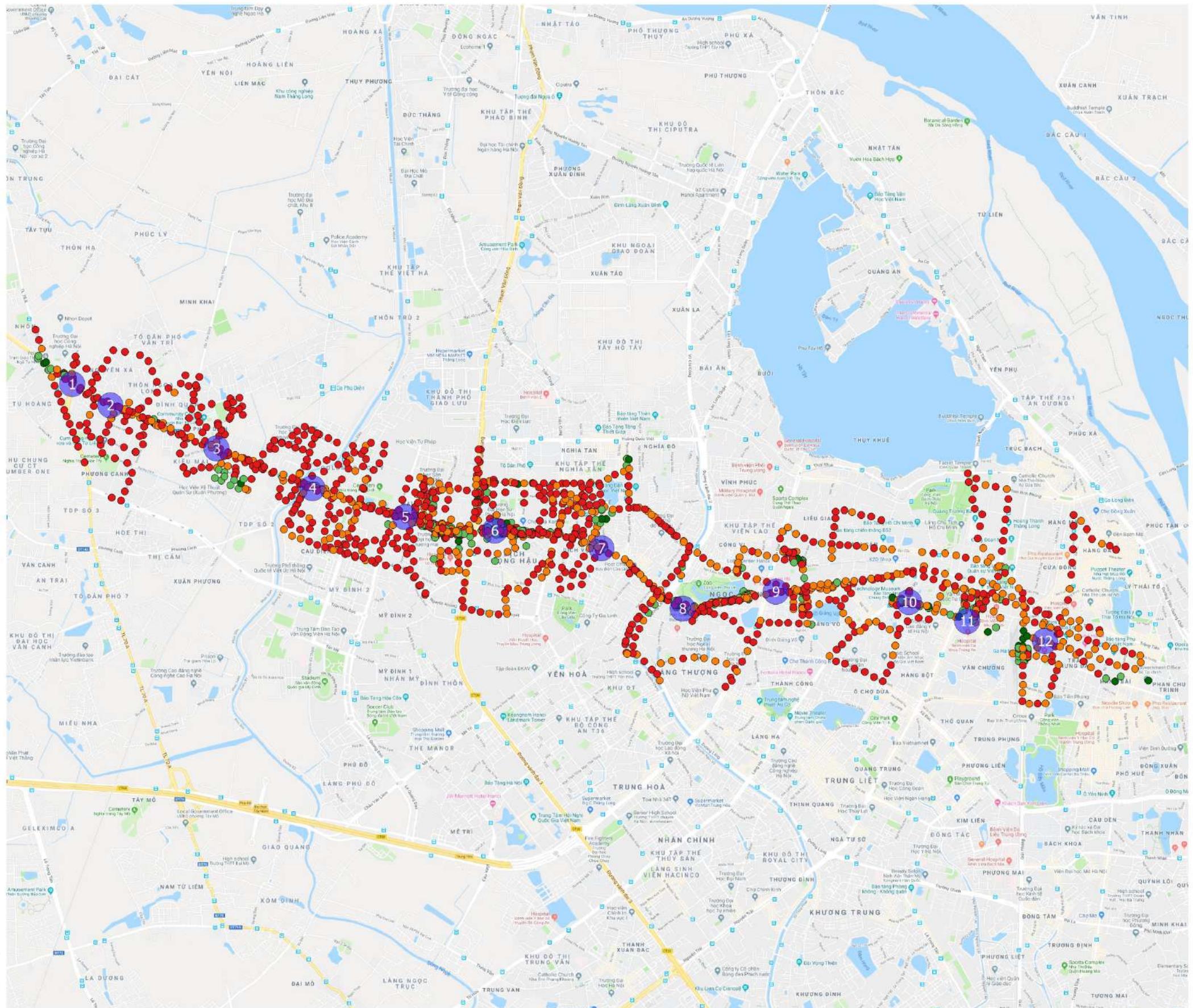
Legend

 Metro Station

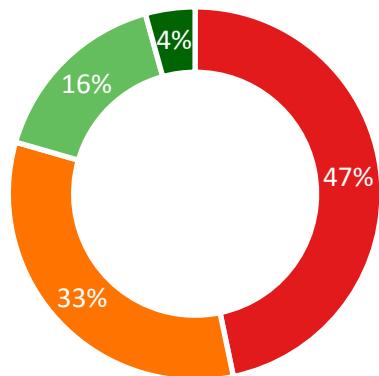
Safety Audits

-  None
-  Minimal
-  Moderate
-  High

Base: Google Map



Security



Hanoi Metro Line 3 Parameter: Openness

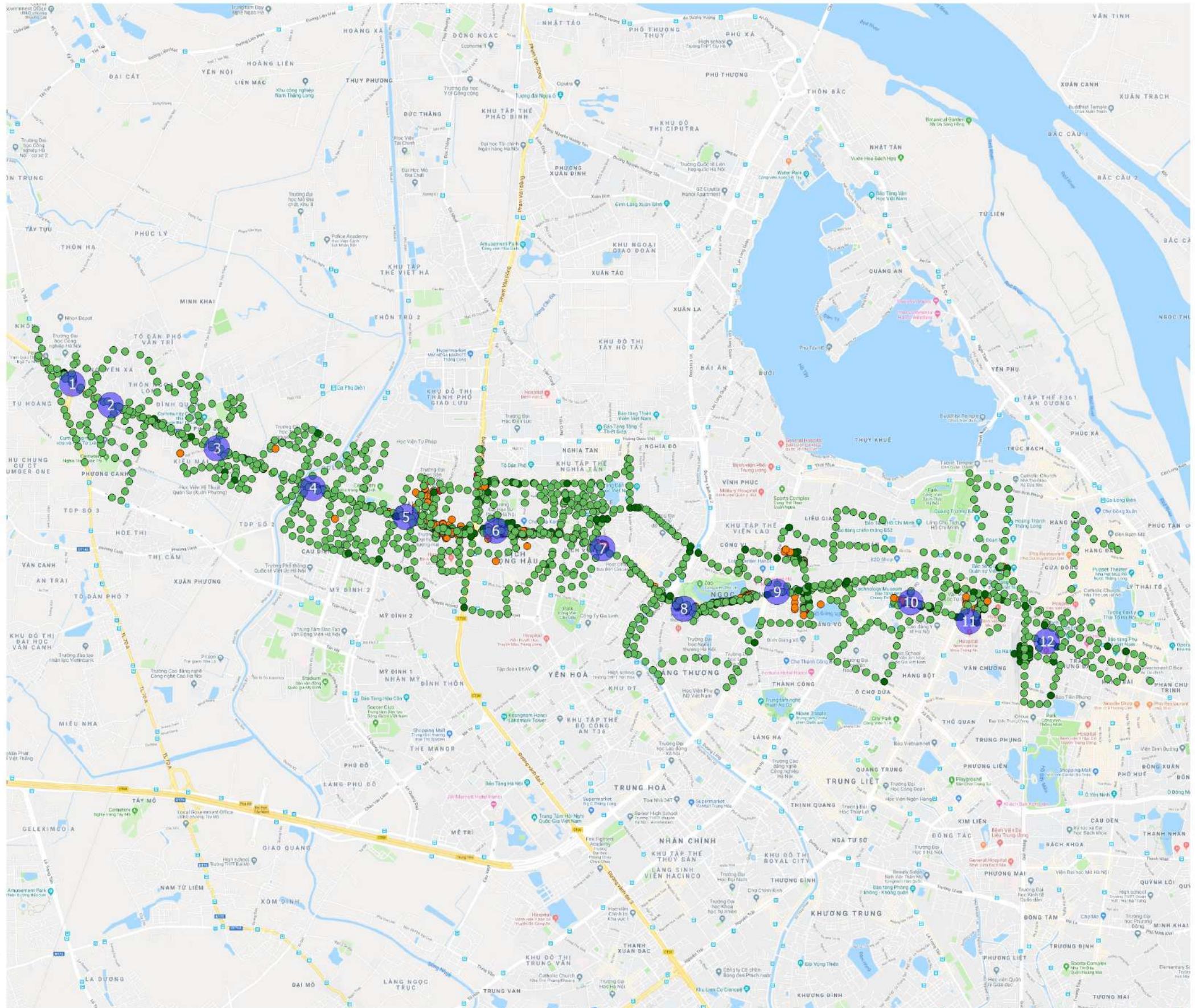
Legend

 Metro Station

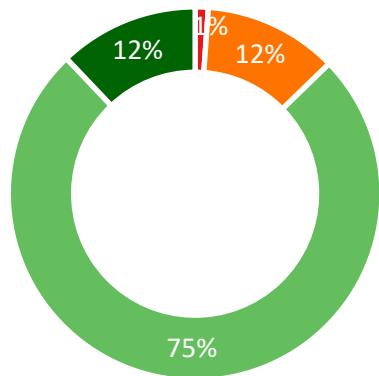
Safety Audits

-  Not Open
-  Partly Open
-  Mostly Open
-  Completely Open

Base: Google Map



Openness



Hanoi Metro Line 3 Parameter: People

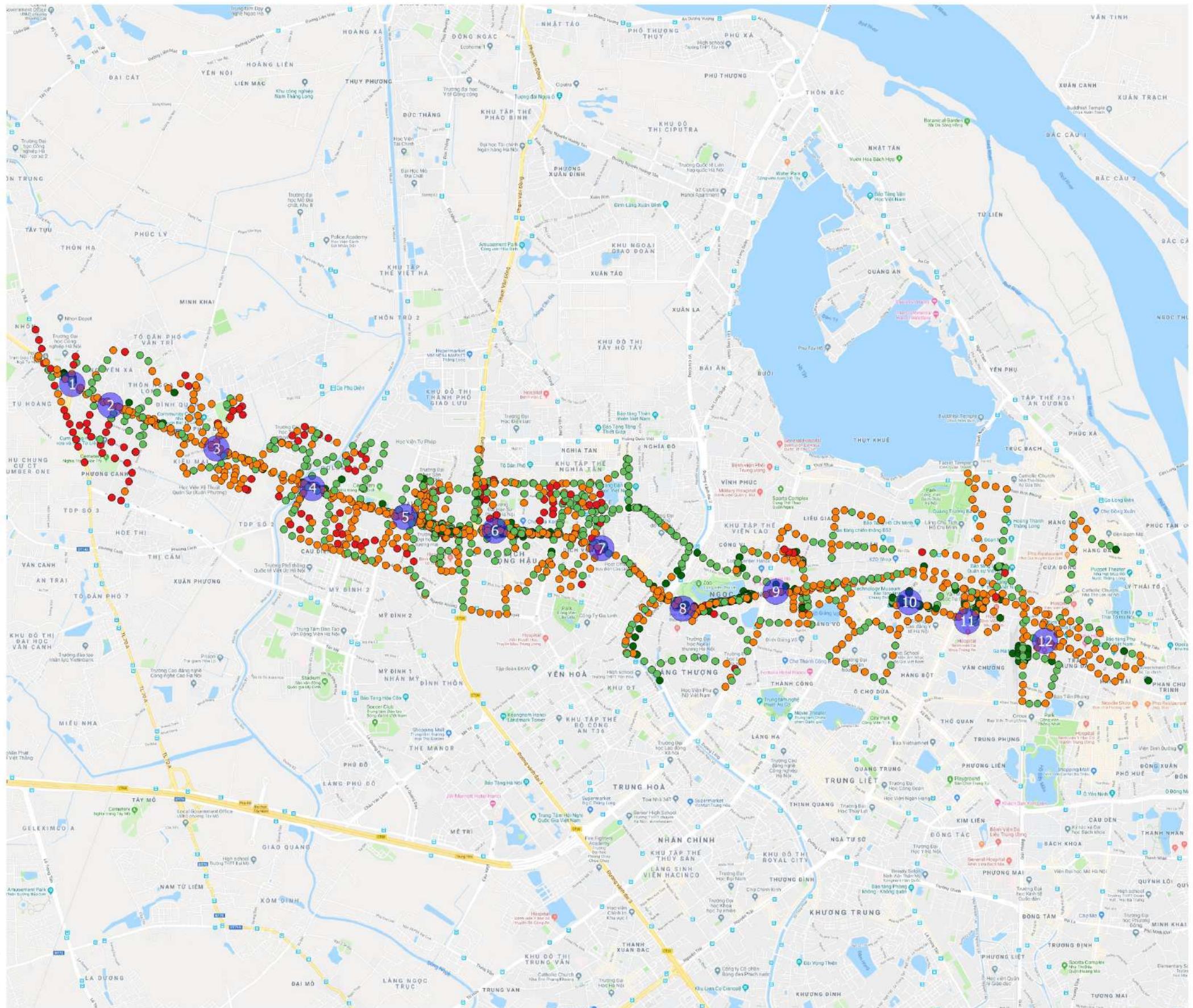
Legend

 Metro Station

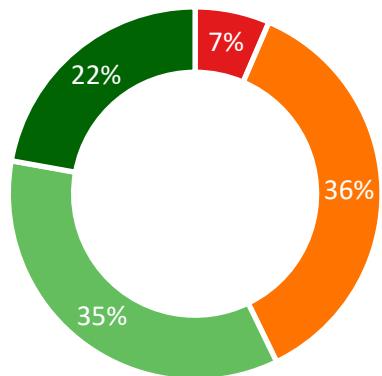
Safety Audits

-  Deserted
-  Few People
-  Some Crowd
-  Crowded

Base: Google Map



People



Hanoi Metro Line 3 Parameter: Gender Usage

Legend

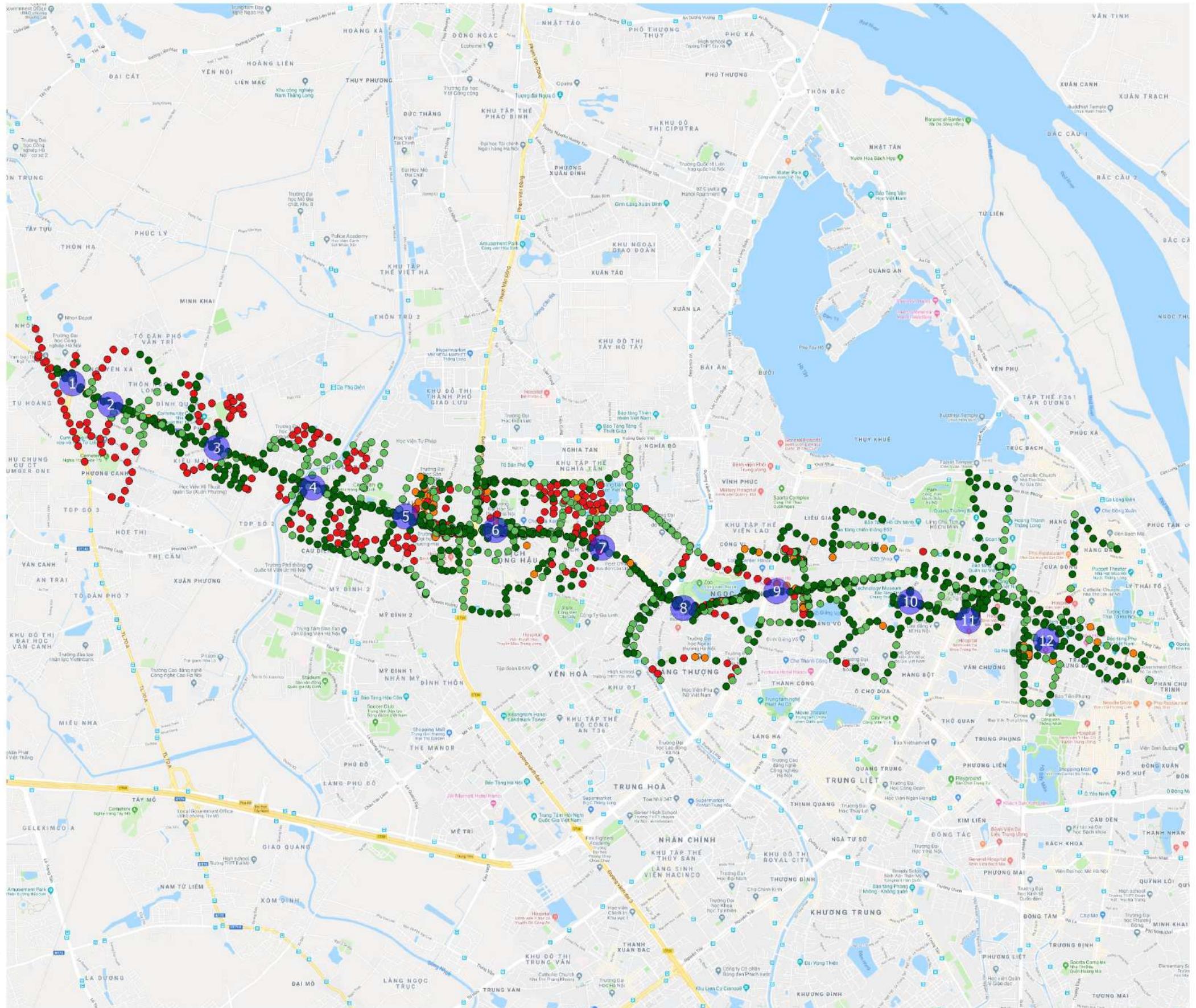
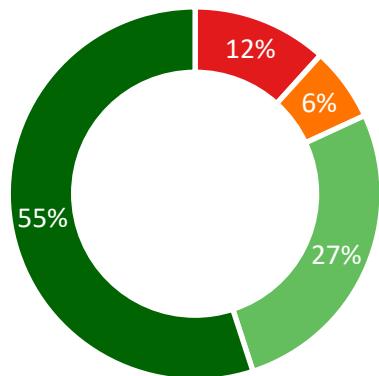
 Metro Station

Safety Audits

-  Not Diverse
-  Somewhat Diverse
-  Fairly Diverse
-  Diverse

Base: Google Map

Gender



Hanoi Metro Line 3 Parameter: Feeling

Legend

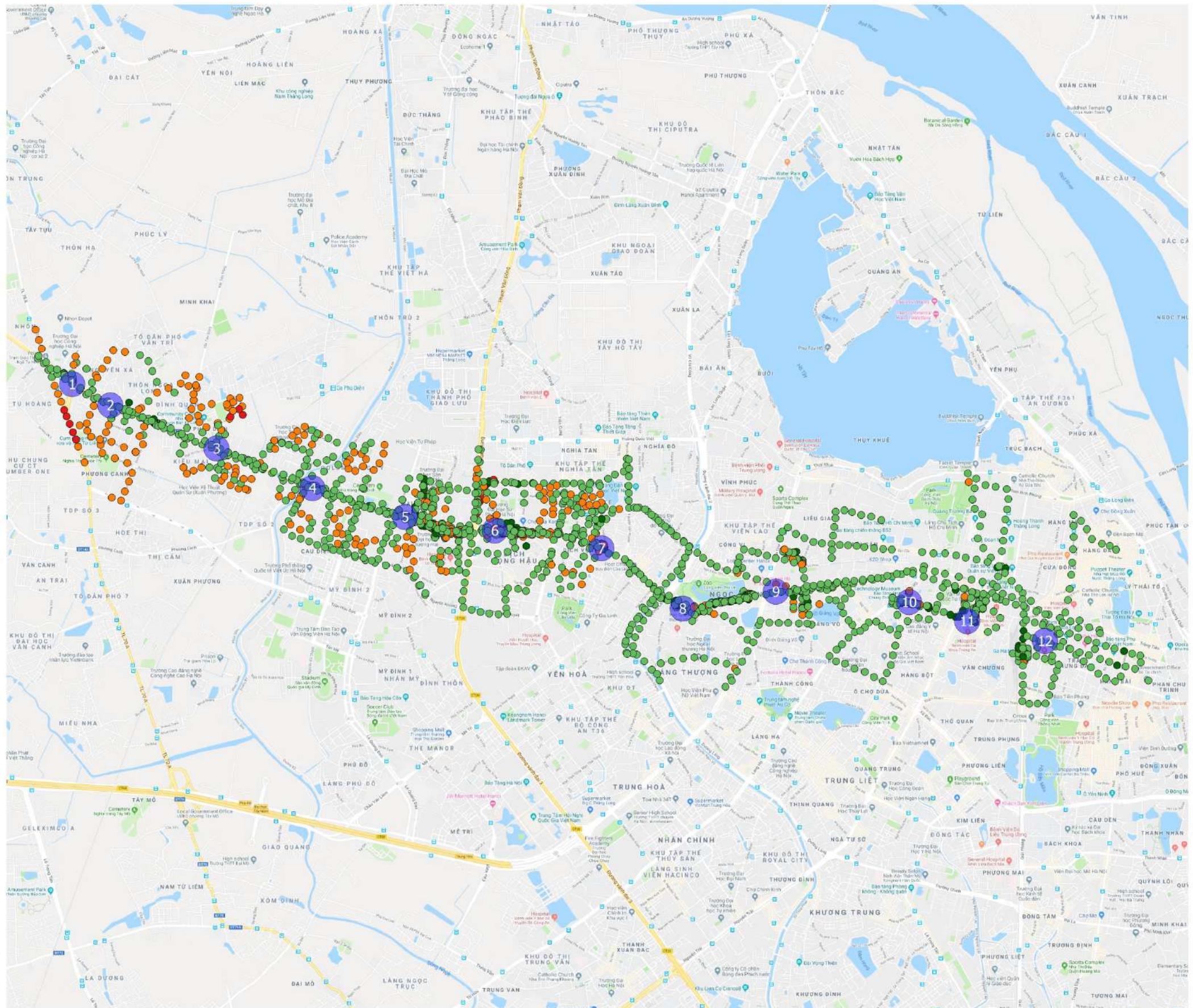
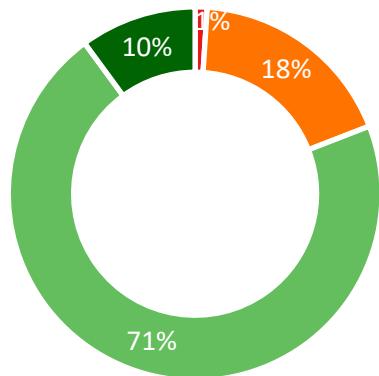
 Metro Station

Safety Audits

-  Frightening
-  Uncomfortable
-  Acceptable
-  Comfortable

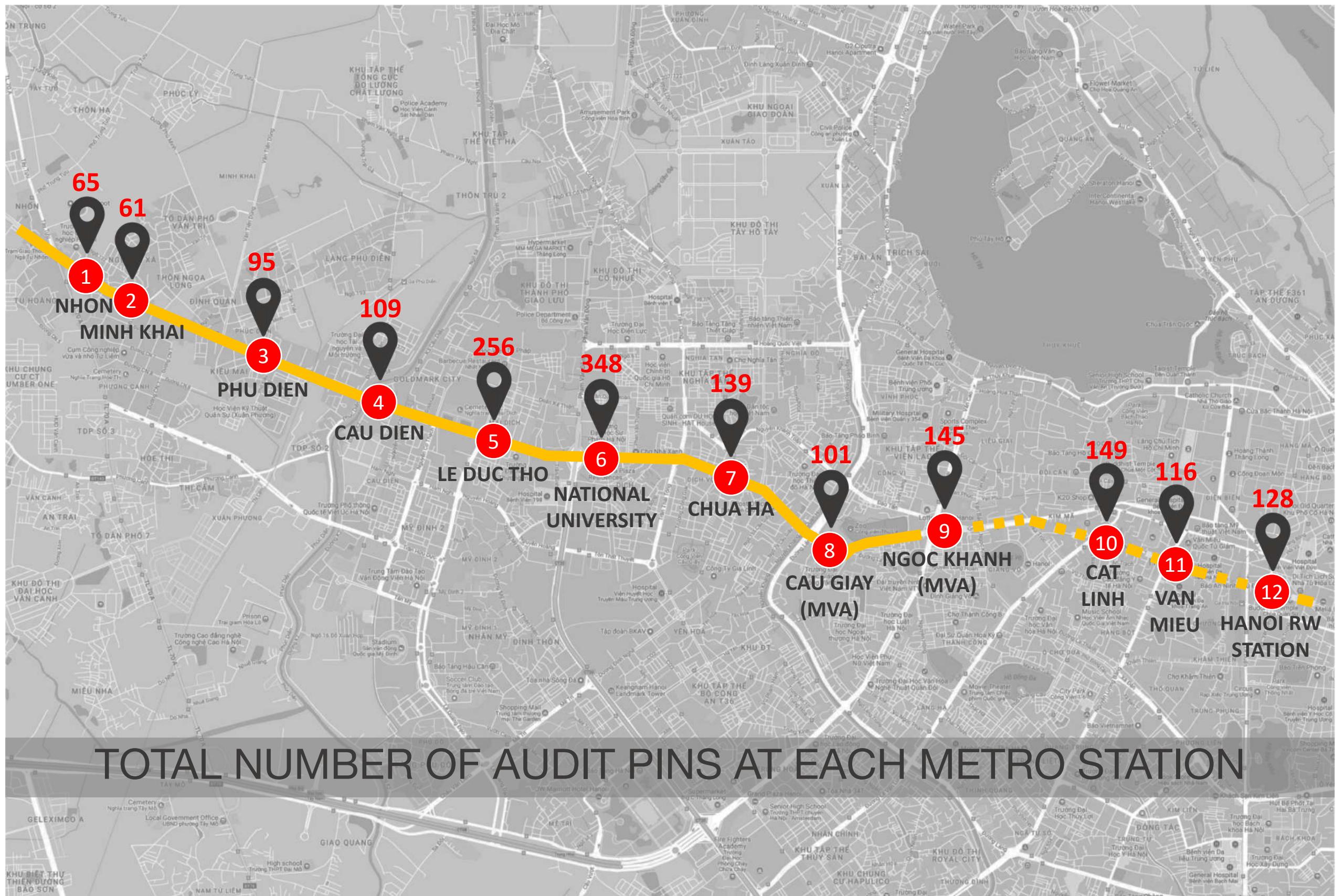
Base: Google Map

Feeling

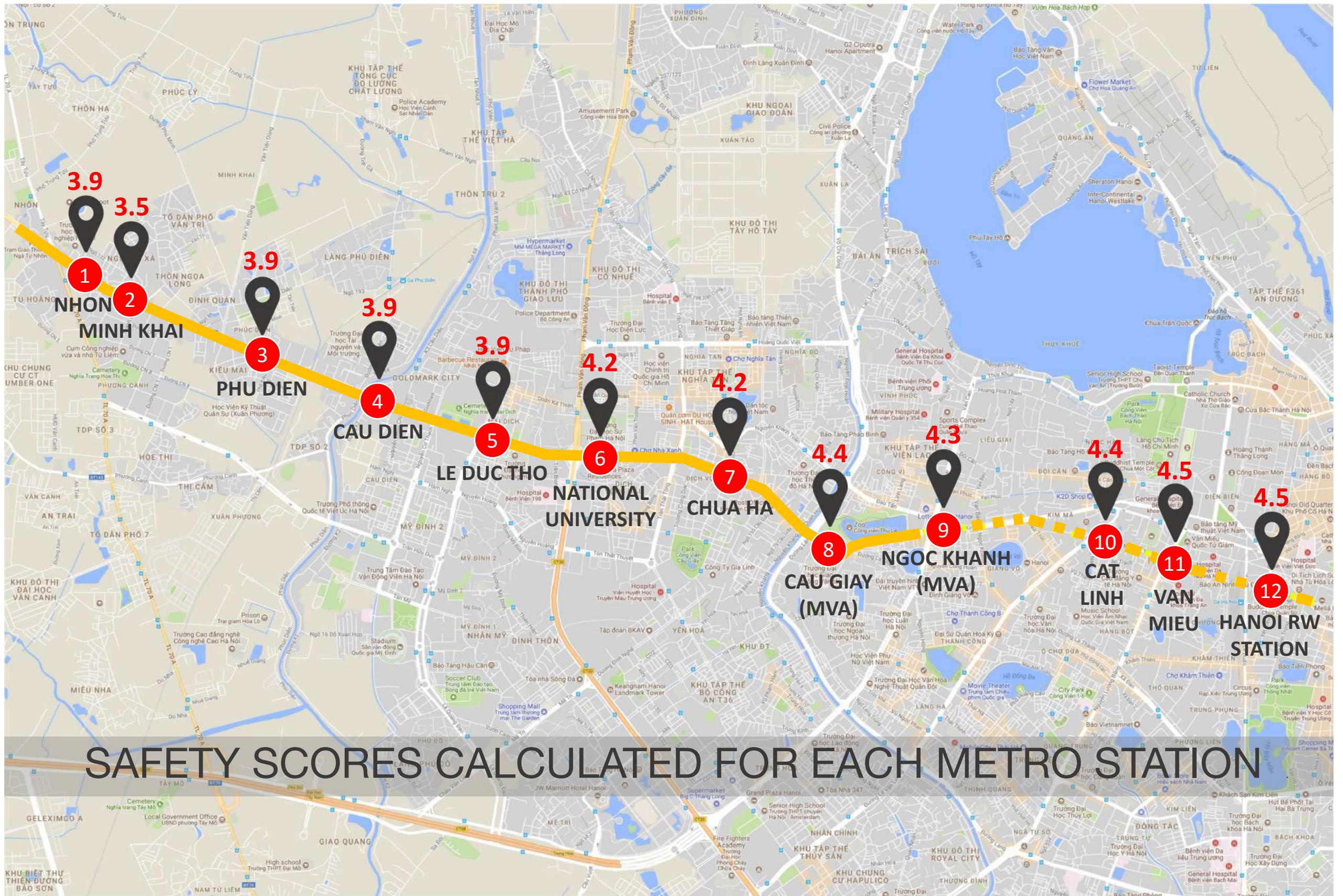


STATION WISE DATA





TOTAL NUMBER OF AUDIT PINS AT EACH METRO STATION

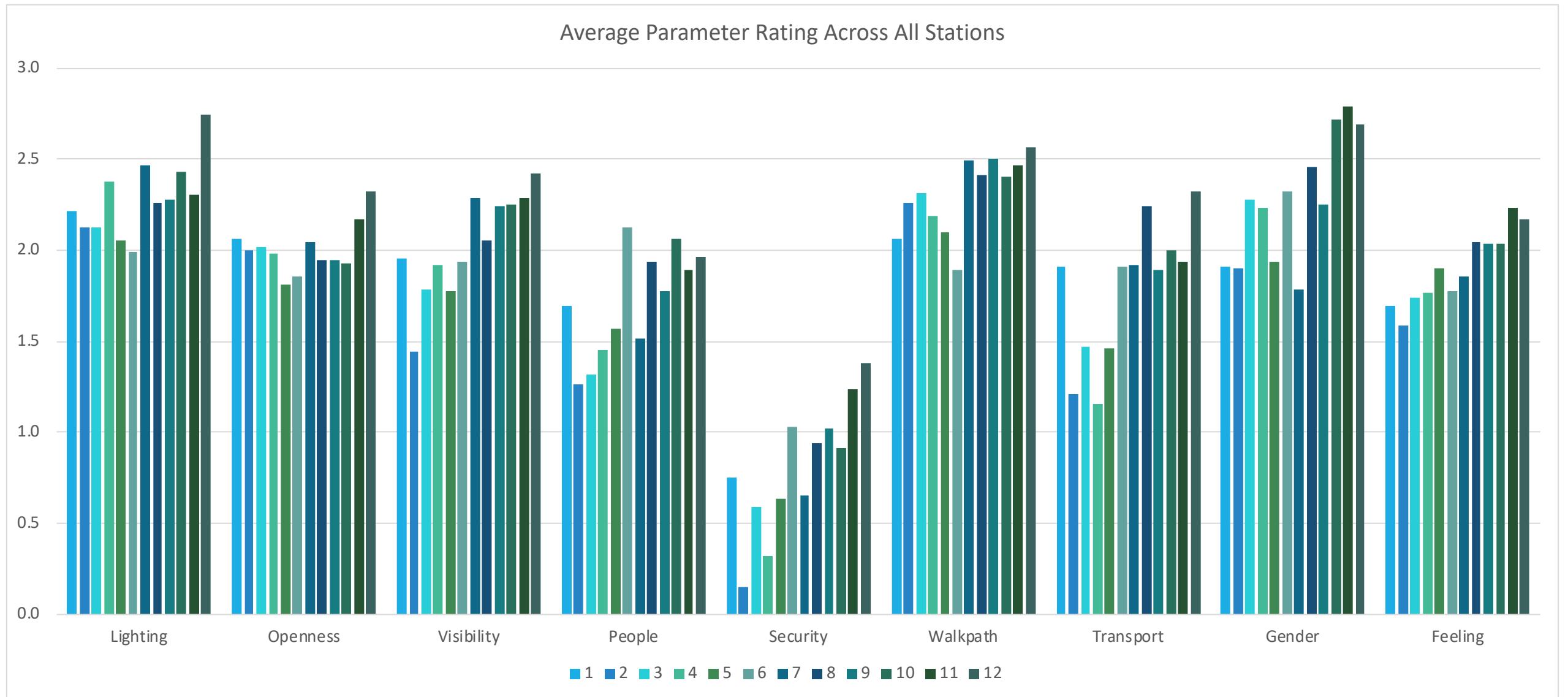


SAFETY SCORES CALCULATED FOR EACH METRO STATION

Comparative Analysis: Parameter Rating Graph

The graph below compares the ratings given for all the nine parameters across twelve stations on the Hanoi Metro Line 3 which Safetipin evaluated through its safety audits. At a glance this helps to understand how each parameter is rated differently at every stations and enables to further enquire the reasons for such ratings. It also graphically illustrates the correlation between the parameters and helps to understand how such dependency eventually informs the quality of the public spaces around them.

For example, if lighting and visibility (a parameter which considers how well a person is visible by others present on the street, an aspect known as ‘eyes on the street’) is good in an area, the need for formal security may not be crucial – as seen in the graph below. Overall security is low whereas overall lighting and visibility is comparatively high. It can be also seen that security in the stations which are in the newer or extended parts of the city is very low but in the inner or older parts of city it is comparatively high.



Data generated revealed issues to be addressed in general across all metro stations and along the metro line. Below are some generic concern areas which needs attention to make streets gender inclusive.
Gender Inclusive Street Design Recommendations

Safe, Accessible, Comfortable Streets must include:

1. **Street Lights** which uniformly lights up the streets without leaving any dark patches so that the entire surrounding is clearly visible.
2. **Sidewalks and Medians** (proper kerb cut or kerb drop, tactile tiles and guide rails) which improves accessibility and mobility. Clear usable routes without any disruption or encroachments.
3. **Informal shopping/eating** to be allowed to enable people engage in street activity hence making it safer.
4. **Public Amenities** at every metro station to include, Bus Shelters, Toilets and Police Assistance Booths.
5. **At Grade Pedestrian Crossings** to allow all users to easily and safely cross the streets. Foot-over bridges and underpasses include hardships to climb up/down and increases vulnerability.
6. **Traffic Signals, Street Signage and Road Markings** which assists vulnerable groups to take quicker and safer decisions while using the streets.
7. **Traffic Calming** measures to be taken around every metro station to increase safety and accessibility.
8. **Drainage and Slopes** to be engineered properly to avoid water logging which makes the streets inaccessible especially for vulnerable groups.
9. **Street Furniture** should have waiting, resting places.
10. **Parking Spaces** at every metro station to include para-transit vehicle, motorbike/bicycle stands and car parking areas which are organized, adequate and safe.

Right: A typical sidewalk in Hanoi during a working week day.

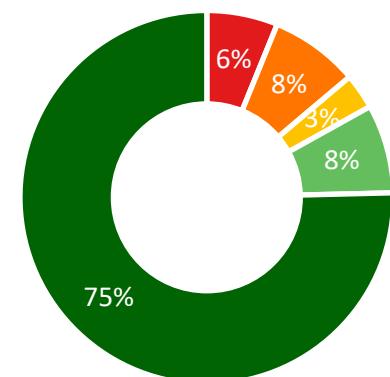


First Station of Hanoi Metro Line 3

Nhon Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting was poor or missing and parameters like transport, people and security needed more attention. In the following data analysis of this station it can understood how to use these findings to improve accessibility and mobility for women and girls.

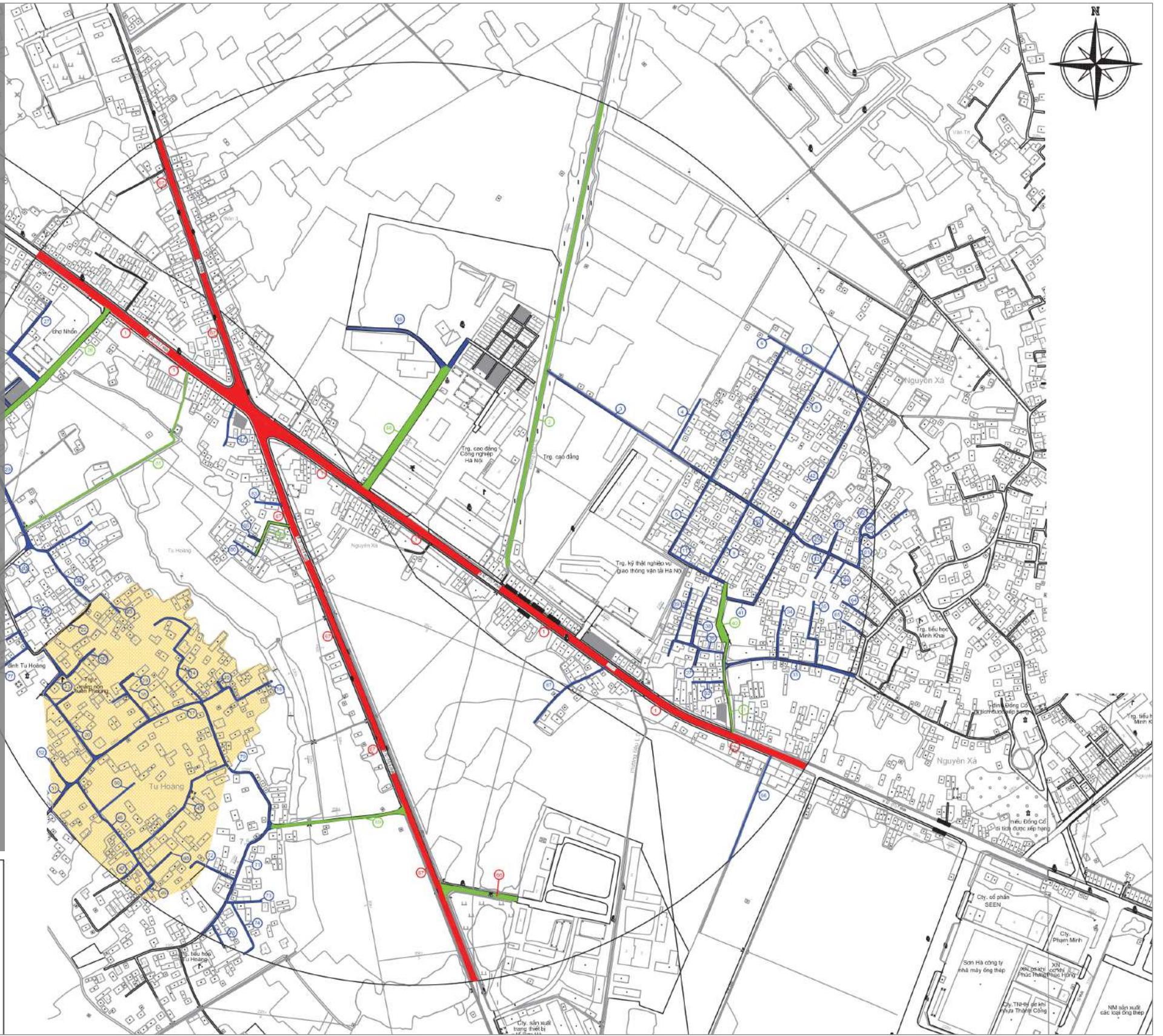
NHON

Safety Score 3.9/5



SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Sfetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:
Engineering Design Report, 18 APR 2014





POOR LIGHT



BRIGHT LIGHT



NO WALKPATH



GOOD WALKPATH



NO VISIBILITY



GOOD VISIBILITY



GENDER NOT DIVERSE



GENDER FAIRLY DIVERSE

65 Audit Pins within 500m radius of Nhon Station

A total of 65 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 1 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Basing on such collected data a safety score of 3.9 on a scale of 5 is given for Station Nhon (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 75% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 8% is good and the remaining 17% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	4
Below Average	1.1 - 2.0	5
Average	2.1 - 3.0	2
Good	3.1 - 4.0	5
Excellent	4.1 - 5.0	49

Left: Images from Manual and Nite Audits.

Hanoi Metro Line 3 Nhon Station 1 Safety Score

Legend

 Metro Station

Safety Audits

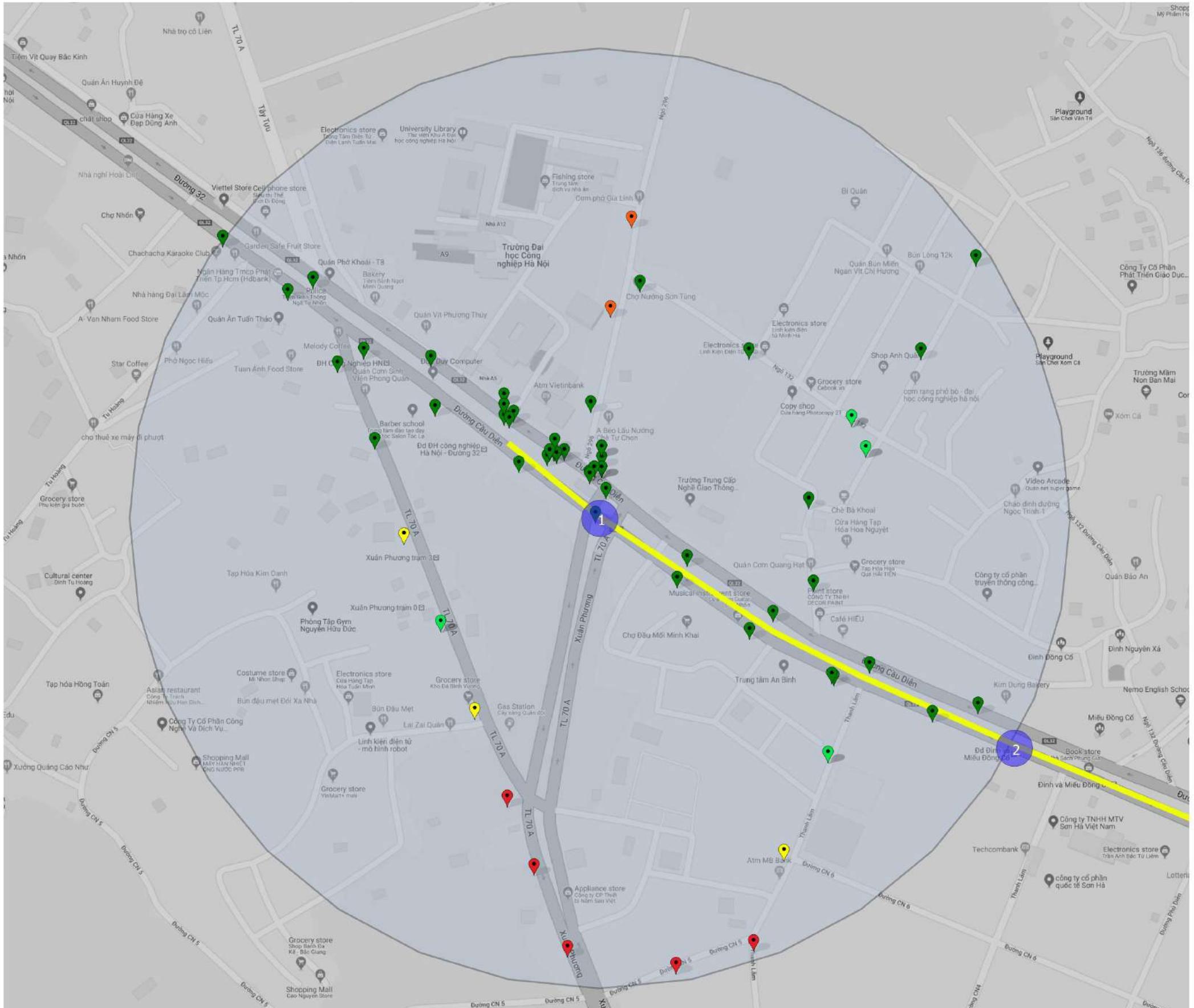
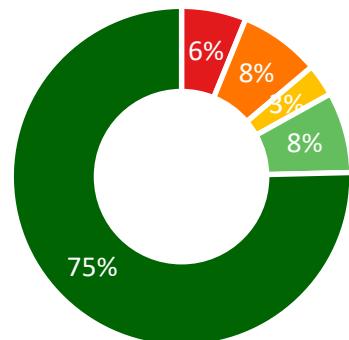
-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

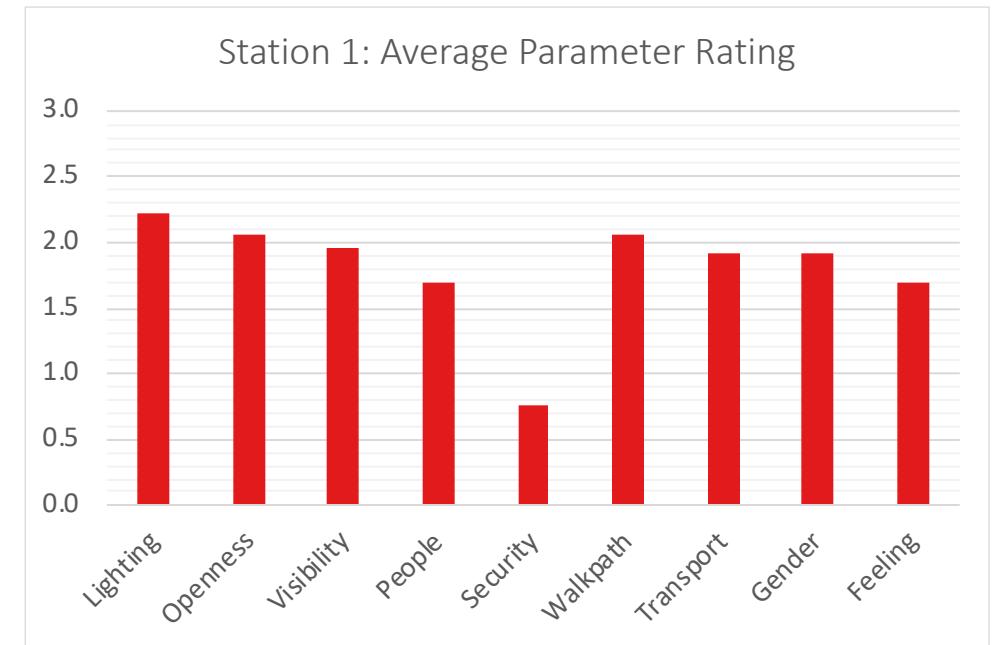
Metro Line

-  Overhead
-  500 Meter Radius

Base: Google Map

Safety Score 3.9/5





Nhon Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath parameter has been rated the highest, followed by other parameters such as Lighting, Openness and Visibility. Transport, People and Gender Usage parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 1, Nhon

**Hanoi Metro Line 3
Nhon
Station 1
Lighting**

Legend

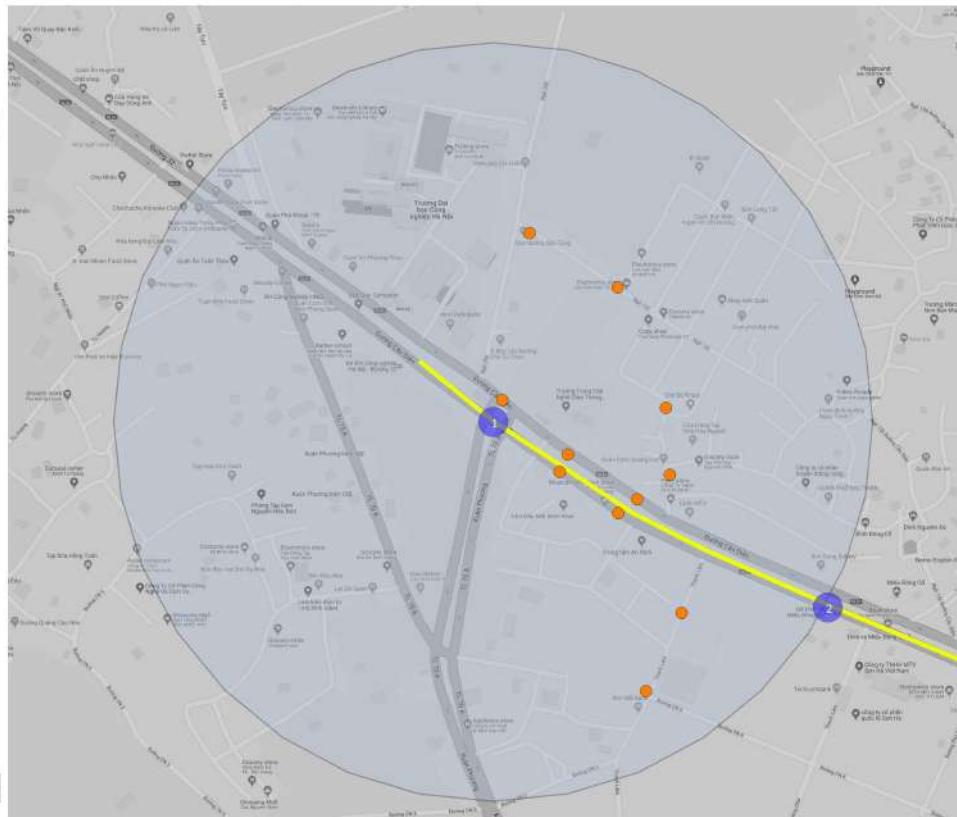
- Metro Station
- Subparameter
- No Street Light
- Off Street Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Nhon
Station 1
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Distant
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women’s accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 01 showing all the information stored in each geo-tagged point with supporting images:

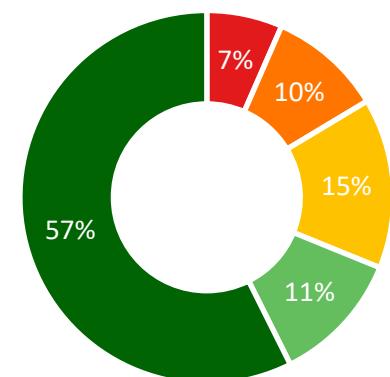
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
539276	21.0524	105.736	5/23/2018 12:30	21048	3	2	3	2	0	2	3	3	2	4.5	115270595751.png	215270595751.png	315270595751.png
551387	21.0531	105.735	8/14/2018 18:38	45559	2	3	3	3	1	0	3	3	2	4.5	115342466721.png	215342466721.png	
551388	21.0524	105.736	8/14/2018 18:48	45559	3	3	3	3	1	2	3	3	3	4.8	115342472461.png	215342472461.png	
551392	21.0524	105.736	8/14/2018 18:49	45644	2	3	3	3	1	2	3	3	3	4.8	115342473241.png	215342473241.png	
570812	21.05461	105.7321	8/20/2018 18:47	17333	3	2	2	1	2	3	1	0	2	4.3	184709-10855.jpg		
551393	21.0525	105.736	8/14/2018 18:49	45599	2	2	3	3	2	2	2	3	2	4.5	115342473281.png	215342473281.png	
551395	21.0522	105.736	8/14/2018 18:50	45381	2	1	2	3	2	1	1	3	1	4.1	015342474171.jpg	115342474171.jpg	
551396	21.0524	105.736	8/14/2018 18:52	45559	3	3	3	2	2	2	3	3	2	4.6	115342475421.png		
570817	21.05409	105.7328	8/20/2018 18:47	17333	3	2	3	0	2	3	2	0	2	4.4	184723-10855.jpg	184717-10855.jpg	
551397	21.05236	105.7359	8/14/2018 18:53	45626	2	1	1	3	2	1	3	3	1	4.3	015342476091.jpg	115342476091.jpg	
551398	21.0526	105.736	8/14/2018 18:57	45644	2	2	2	3	2	2	3	3	2	4.5	115342478031.png	215342478031.png	
551399	21.0524	105.7359	8/14/2018 18:57	45626	2	1	1	3	2	1	2	3	1	4.2	015342478491.jpg	115342478491.jpg	
570822	21.05353	105.7336	8/20/2018 18:47	17333	3	2	3	0	2	3	3	0	2	4.4	184727-10855.jpg	184732-10855.jpg	
551400	21.05256	105.7355	8/14/2018 18:58	45628	2	2	2	3	2	2	3	3	2	4.5	015342478791.jpg	115342478791.jpg	
551401	21.0526	105.736	8/14/2018 18:58	45559	3	3	3	3	2	3	2	3	2	4.7	115342478921.png	215342478921.png	
551402	21.0526	105.736	8/14/2018 18:59	45599	3	2	1	3	2	2	2	3	2	4.4	115342479101.png	215342479101.png	
570827	21.05299	105.7343	8/20/2018 18:47	17333	3	2	1	1	2	3	3	3	2	4.4	184742-10855.jpg		
551404	21.05257	105.7356	8/14/2018 18:59	45628	3	3	3	3	2	3	3	3	3	4.9	015342479711.jpg		
551408	21.05254	105.7355	8/14/2018 19:04	45670	2	2	2	2	2	2	2	3	3	4.5	015342482231.jpg	115342482231.jpg	
570832	21.05245	105.7352	8/20/2018 18:47	17333	3	2	0	1	2	2	3	3	2	4.3	184752-10855.jpg	184758-10855.jpg	
551410	21.0529	105.735	8/14/2018 19:04	45644	2	2	2	3	2	2	3	3	2	4.5	115342482531.png	215342482531.png	
551411	21.053	105.735	8/14/2018 19:05	45599	2	3	3	3	2	2	3	3	2	4.7	115342482711.png	215342482711.png	
571603	21.04875	105.7379	09/09/18 20:42	17333	1	2	0	0	2	2	1	2	1	2.6	204226-11005.jpg		
551412	21.05251	105.7354	8/14/2018 19:05	45670	3	3	3	3	2	3	3	3	2	4.8	015342482841.jpg		
570837	21.05197	105.7359	8/20/2018 18:48	17333	3	2	2	2	2	3	2	2	2	4.4	184803-10855.jpg	184809-10855.jpg	
571604	21.04967	105.7383	09/09/18 20:42	17333	1	2	1	2	2	2	1	2	1	3.5	204214-11005.jpg	204208-11005.jpg	
551413	21.05267	105.7355	8/14/2018 19:05	45626	2	0	1	3	2	1	2	3	2	4.3	015342483051.jpg	115342483051.jpg	
571605	21.05043	105.7384	8/25/2018 18:32	17333	3	2	2	1	2	3	2	3	2	4.4	184840-10855.jpg		
571606	21.05131	105.7382	09/09/18 20:36	17333	3	2	3	2	2	1	1	2	2	4.3	203624-11004.jpg	203644-11004.jpg	
551415	21.05257	105.7355	8/14/2018 19:05	45381	2	2	2	3	2	1	2	3	1	4.3	015342483601.jpg	115342483601.jpg	
570842	21.05135	105.7368	8/20/2018 18:48	17333	3	2	3	1	2	3	1	3	2	4.4	184821-10855.jpg		
571607	21.0521	105.7381	09/09/18 20:34	17333	3	2	2	2	2	1	1	2	2	4.2	203449-11004.jpg		
551416	21.053	105.735	8/14/2018 19:06	45559	3	3	3	3	2	3	3	3	2	4.9	115342483861.png	215342483861.png	
571608	21.05259	105.7387	09/09/18 20:34	17333	2	2	3	2	2	1	0	0	1	3	203423-11004.jpg		
551418	21.05293	105.7351	8/14/2018 19:09	45628	2	2	2	3	2	2	2	3	2	4.4	015342485411.jpg	115342485411.jpg	
551419	21.05287	105.7351	8/14/2018 19:11	45670	2	2	3	3	2	3	3	3	2	4.7	015342486761.jpg	115342486761.jpg	
570846	21.05086	105.7375	8/20/2018 18:48	17333	3	2	2	1	2	3	1	3	2	4.3	184825-10855.jpg	184830-10855.jpg	
570849	21.05041	105.7384	8/20/2018 18:48	17333	3	2	1	1	2	3	2	3	2	4.3	184840-10855.jpg		
570852	21.05006	105.7394	8/20/2018 18:48	17333	3	2	1	1	2	3	2	3	2	4.3	184855-10855.jpg	184850-10855.jpg	
570735	21.0534	105.7333	8/21/2018 20:20	17333	3	2	3	2	2	2	2	0	2	4.4	202057-10864.jpg	202105-10864.jpg	
570736	21.05267	105.7337	8/21/2018 20:21	17333	1	2	3	2	2	2	2	0	2	4.2	202125-10864.jpg	202131-10864.jpg	202119-10864.jpg
570737	21.05177	105.734	8/21/2018 20:22	17333	1	2	1	0	2	1	3	0	1	2	202242-10864.jpg		
570738	21.05093	105.7344	8/21/2018 20:23	17333	1	2	2	1	2	2	3	0	1	3.5	202309-10864.jpg	202315-10864.jpg	202322-10864.jpg
570741	21.0501	105.7347	8/21/2018 20:23	17333	1	2	1	1	2	1	2	0	1	2	202341-10864.jpg	202330-10864.jpg	

Second Station of Hanoi Metro Line 3

Minh Khai Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting was poor or missing and parameters like transport, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

MINH KHAI

Safety Score 3.5/5

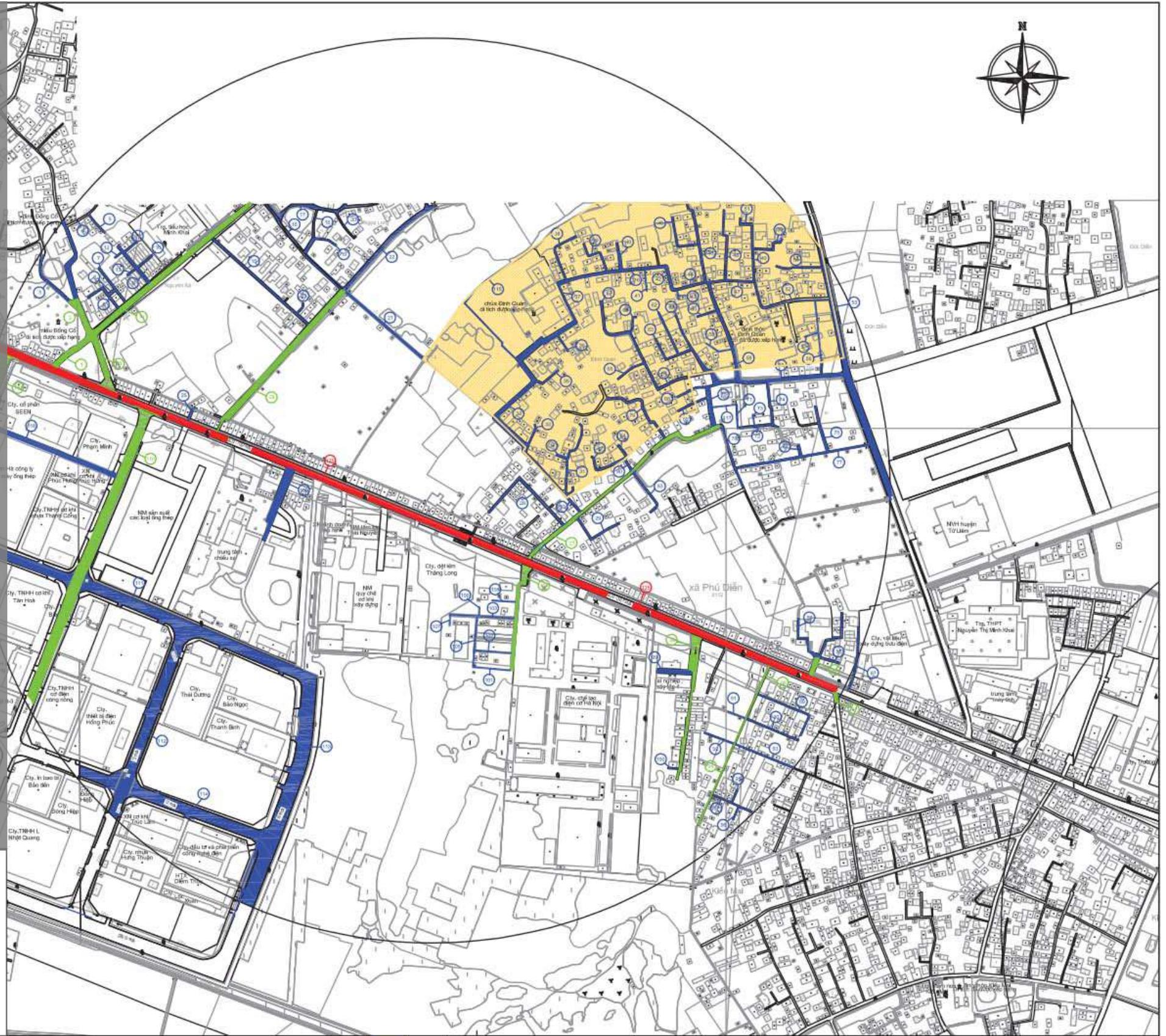


SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station



BAD CONDITION PHOTOS AROUND STATION 2

GOOD CONDITION PHOTOS AROUND STATION 2



POOR LIGHT



BRIGHT LIGHT



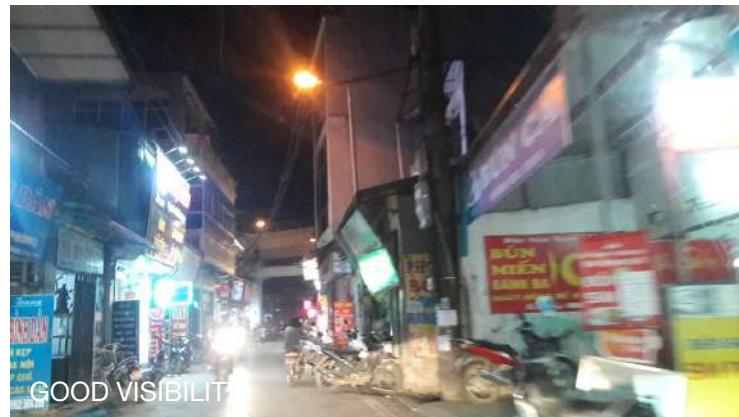
NO WALKPATH



GOOD WALKPATH



NO VISIBILITY



GOOD VISIBILITY



NO PEOPLE



SOME PEOPLE

61 Audit Pins within 500m radius of Minh Khai Station

A total of 61 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 2 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows the number of people present on the streets and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 3.5 on a scale of 5 is given for Station Minh Khai (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 57% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 11% is good and the remaining 32% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	4
Below Average	1.1 - 2.0	6
Average	2.1 - 3.0	9
Good	3.1 - 4.0	7
Excellent	4.1 - 5.0	35

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Minh Khai Station 2 Safety Score

Legend

 Metro Station

Safety Audits

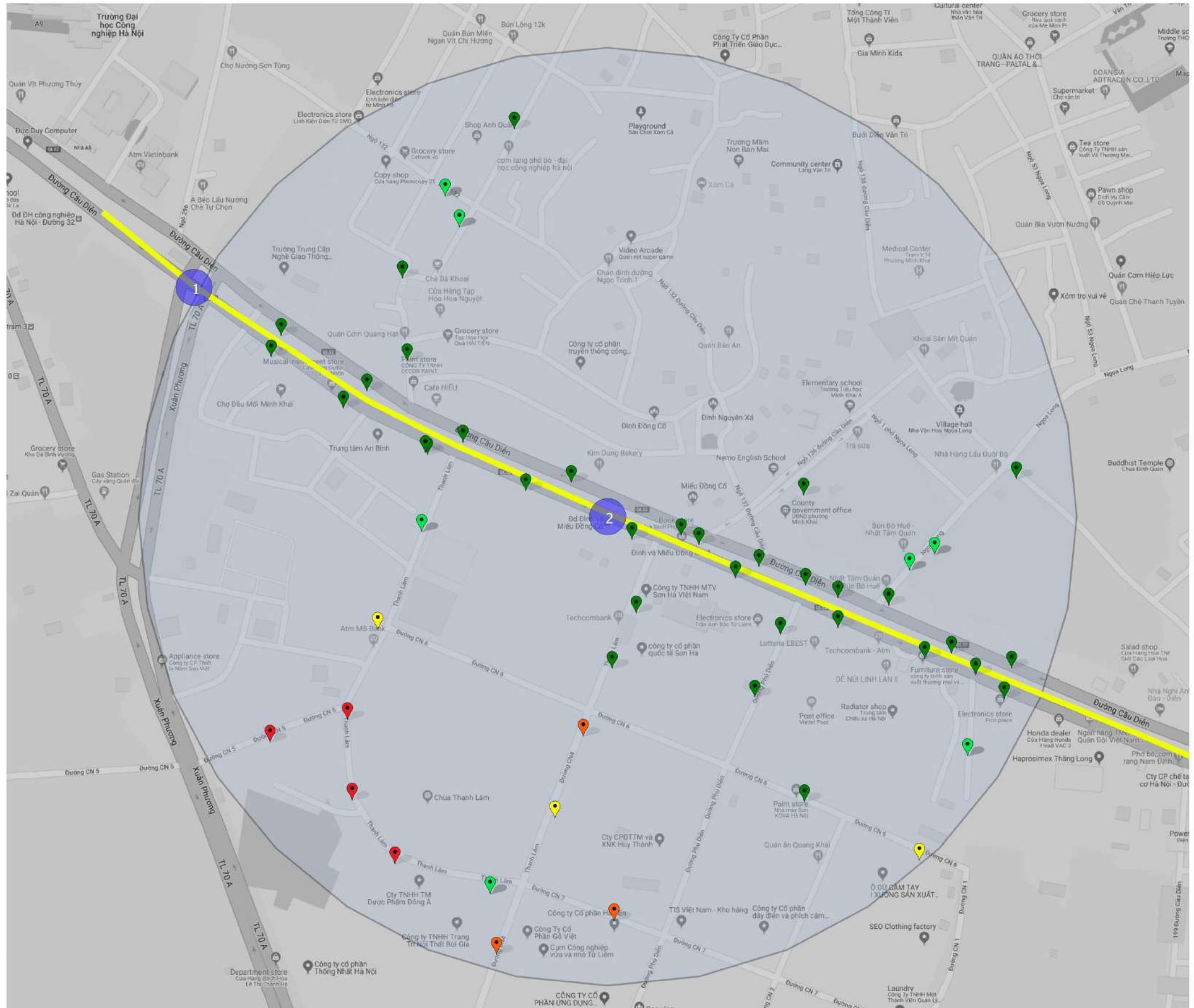
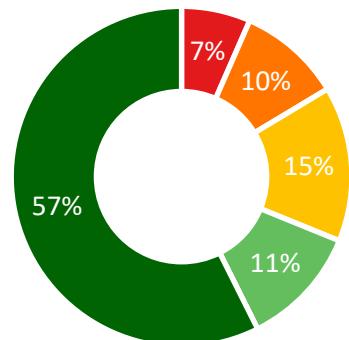
-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

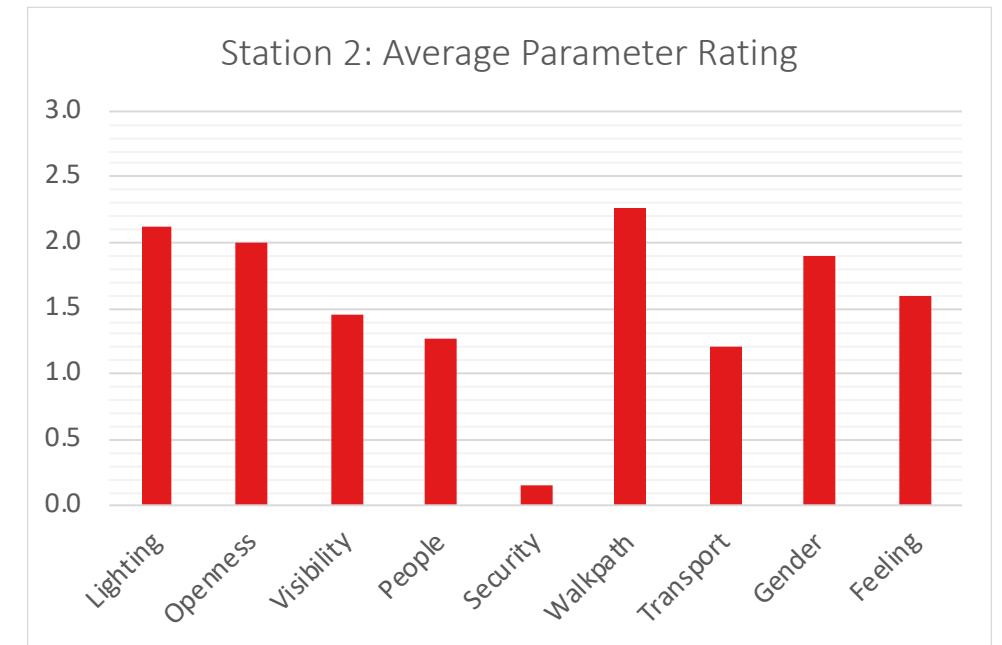
Metro Line

-  Overhead
-  500 Meter Radius

Base: Google Map

Safety Score 3.5/5





Minh Khai Station:

Average Parameter Rating Graph

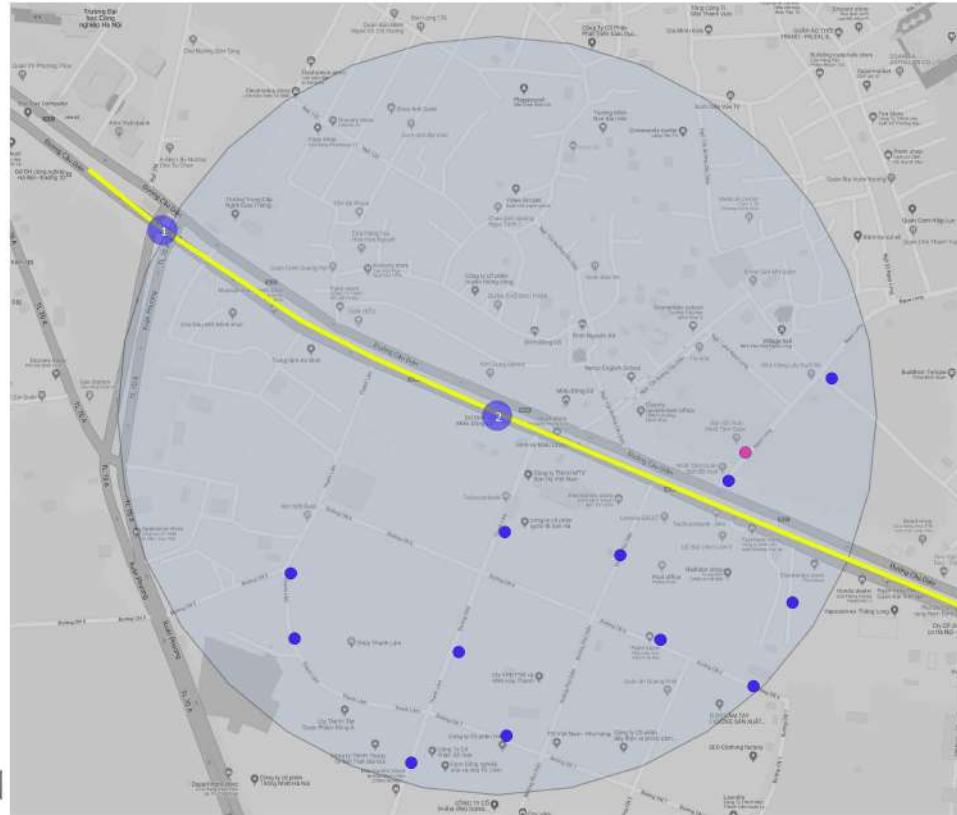
The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath parameter has been rated the highest, followed by other parameters such as Lighting, Openness and Gender Usage. Transport, People and Visibility parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 2, Minh Khai

**Hanoi Metro Line 3
Minh Khai
Station 2
Lighting**

Legend

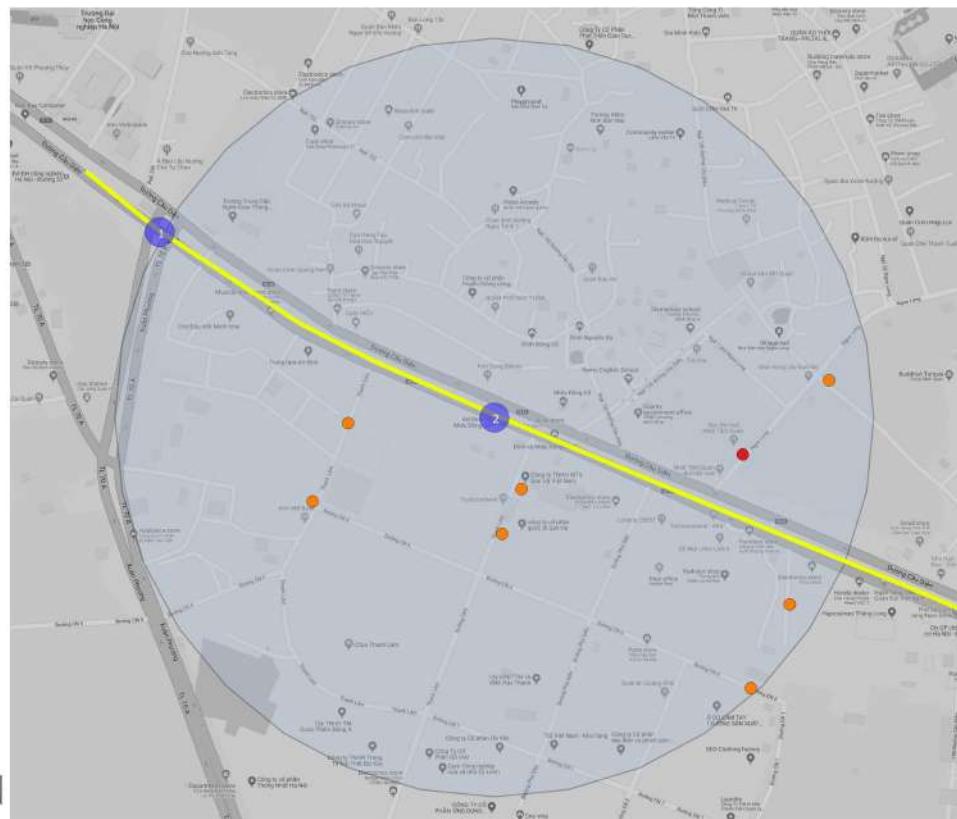
- Metro Station
- Subparameter
- No Street Light
- Off Street Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Minh Khai
Station 2
Correlation
(Gender+Lighting)**

Legend

- Metro Station
- Lighting
- Poor Light
- Some Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO LIGHTING WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor street lighting is available.

Recommendation: Well light streets are of primary concern when it comes to women’s safety in public places. Even when other public infrastructures are functional but street lighting is poor or missing, women’s participation and usage of that public place will decline over time. So it is of utmost importance to provide street lighting at these identified spots around the metro station where women are present.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 02 showing all the information stored in each geo-tagged point with supporting images:

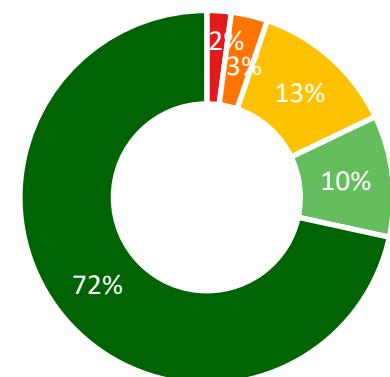
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
571193	21.04595	105.7403	8/21/2018 20:38	17333	1	2	0	0	0	2	1	0	1	1.3	203844-10866.jpg	203848-10866.jpg	
571197	21.04539	105.7417	8/21/2018 20:35	17333	3	2	1	0	0	2	0	0	1	2	203534-10865.jpg	203530-10865.jpg	
551741	21.0483	105.744	8/18/2018 20:28	45789	2	2	3	2	0	2	1	3	2	4.3	115345982611.png	215345982611.png	
551742	21.04837	105.7444	8/18/2018 20:17	45797	2	2	2	1	0	2	1	1	2	4.1	015345982661.jpg	115345982661.jpg	215345982661.jpg
571587	21.05106	105.7454	09/09/18 20:18	17333	1	2	0	2	0	2	0	2	1	2.6	201812-11004.jpg	201807-11004.jpg	
571588	21.05018	105.7444	09/09/18 20:16	17333	1	2	2	2	0	2	1	2	2	4.1	201656-11004.jpg	201653-11004.jpg	
551743	21.05002	105.7422	8/18/2018 20:17	45646	2	2	3	3	1	3	3	3	3	4.8	015345982771.jpg		
571203	21.04489	105.743	8/21/2018 20:36	17333	2	2	0	0	0	2	0	0	1	1.3	203600-10865.jpg	203606-10865.jpg	
571589	21.04945	105.7436	8/25/2018 18:24	17333	2	2	1	2	0	1	1	2	1	3.5	182416-10913.jpg	182412-10913.jpg	
571590	21.04897	105.7431	8/25/2018 18:24	17333	2	2	2	2	1	1	2	2	2	4.3	182437-10913.jpg	182432-10913.jpg	
571206	21.04569	105.7438	8/21/2018 20:36	17333	1	2	1	2	0	1	0	2	1	2.6	203633-10865.jpg	203637-10865.jpg	
571591	21.04904	105.7426	8/21/2018 20:16	17333	3	2	3	1	0	3	2	3	2	4.4	201641-10864.jpg		
571209	21.04666	105.7438	8/21/2018 20:43	17333	2	2	1	2	0	2	1	2	2	4.1	204329-10866.jpg	204347-10866.jpg	
571592	21.04934	105.7418	8/21/2018 20:16	17333	3	2	1	1	1	3	3	3	2	4.4	201653-10864.jpg	201649-10864.jpg	
571593	21.04963	105.741	8/21/2018 20:17	17333	3	2	3	1	0	3	3	3	2	4.5	201704-10864.jpg	201700-10864.jpg	
571212	21.04753	105.7439	8/21/2018 20:42	17333	1	2	1	2	0	2	1	2	1	3.5	204241-10866.jpg	204229-10866.jpg	
571594	21.04889	105.7405	09/09/18 20:45	17333	1	2	2	2	1	2	2	2	2	4.3	204529-11005.jpg		
571595	21.04836	105.7403	09/09/18 20:45	17333	1	2	1	2	1	2	2	2	2	4.2	204517-11005.jpg	204520-11005.jpg	
571596	21.04772	105.74	8/21/2018 20:39	17333	2	2	0	0	0	2	1	0	1	1.6	203932-10866.jpg	204511-11005.jpg	
571597	21.04694	105.7397	8/21/2018 20:39	17333	3	2	0	0	0	3	1	0	1	2.6	203920-10866.jpg	203916-10866.jpg	
571598	21.0462	105.739	09/09/18 20:44	17333	2	2	1	2	0	3	1	0	1	3.5	204421-11005.jpg	204416-11005.jpg	
571599	21.04649	105.738	09/09/18 20:44	17333	1	2	0	0	0	2	0	0	1	0.9	204411-11005.jpg	204409-11005.jpg	
571600	21.0471	105.7376	09/09/18 20:44	17333	1	2	0	0	0	2	0	0	1	0.9	204400-11005.jpg	204356-11005.jpg	
571601	21.04787	105.7376	09/09/18 20:43	17333	1	2	0	0	0	2	0	0	1	0.9	204346-11005.jpg	204238-11005.jpg	
571602	21.04766	105.7368	09/09/18 20:43	17333	1	2	0	0	0	2	0	0	1	0.9	204326-11005.jpg		
571603	21.04875	105.7379	09/09/18 20:42	17333	1	2	0	0	1	2	1	2	1	2.6	204226-11005.jpg		
571604	21.04967	105.7383	09/09/18 20:42	17333	1	2	1	2	0	2	1	2	1	3.5	204214-11005.jpg	204208-11005.jpg	
571605	21.05043	105.7384	8/25/2018 18:32	17333	3	2	2	1	0	3	2	3	2	4.4	184840-10855.jpg		
571606	21.05131	105.7382	09/09/18 20:36	17333	3	2	3	2	0	1	1	2	2	4.3	203624-11004.jpg	203644-11004.jpg	
570842	21.05135	105.7368	8/20/2018 18:48	17333	3	2	3	1	0	3	1	3	2	4.4	184821-10855.jpg		
571607	21.0521	105.7381	09/09/18 20:34	17333	3	2	2	2	0	1	1	2	2	4.2	203449-11004.jpg		
571231	21.04654	105.7434	8/21/2018 20:37	17333	1	2	0	2	0	2	0	2	1	2.6	203713-10866.jpg	203707-10866.jpg	
571608	21.05259	105.7387	09/09/18 20:34	17333	2	2	3	2	0	1	0	0	1	3	203423-11004.jpg		
570846	21.05086	105.7375	8/20/2018 18:48	17333	3	2	2	1	0	3	1	3	2	4.3	184825-10855.jpg	184830-10855.jpg	
571235	21.04709	105.7422	8/21/2018 20:37	17333	2	2	1	2	0	2	1	2	2	4.1	203739-10866.jpg	203743-10866.jpg	
570849	21.05041	105.7384	8/20/2018 18:48	17333	3	2	1	1	0	3	2	3	2	4.3	184840-10855.jpg		
571239	21.04809	105.7417	8/21/2018 20:40	17333	3	2	3	2	0	2	2	2	2	4.4	204037-10866.jpg	204041-10866.jpg	
571241	21.04869	105.742	8/21/2018 20:40	17333	3	2	3	2	0	2	2	2	2	4.4	204052-10866.jpg	204048-10866.jpg	
570852	21.05006	105.7394	8/20/2018 18:48	17333	3	2	1	1	0	3	2	3	2	4.3	184855-10855.jpg	184850-10855.jpg	
570855	21.0496	105.7405	8/20/2018 18:49	17333	3	2	0	1	0	2	3	3	2	4.3	184906-10855.jpg		
571629	21.04851	105.7438	8/21/2018 20:16	17333	3	2	3	2	0	3	1	2	2	4.4	201621-10864.jpg		
570858	21.04923	105.7415	8/20/2018 18:49	17333	3	2	2	1	0	3	3	3	2	4.4	184917-10855.jpg	184921-10855.jpg	
571633	21.0493	105.7433	09/09/18 20:16	17333	0	2	0	2	0	2	2	2	1	3	201631-11004.jpg		
571123	21.04936	105.7492	8/20/2018 18:10	17333	0	2	0	1	0	2	1	3	1	2.6	181037-10852.jpg	181041-10852.jpg	

Third Station of Hanoi Metro Line 3

Phu Dien Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting was poor or missing and parameters like transport, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

PHU DIEN

Safety Score 3.9/5

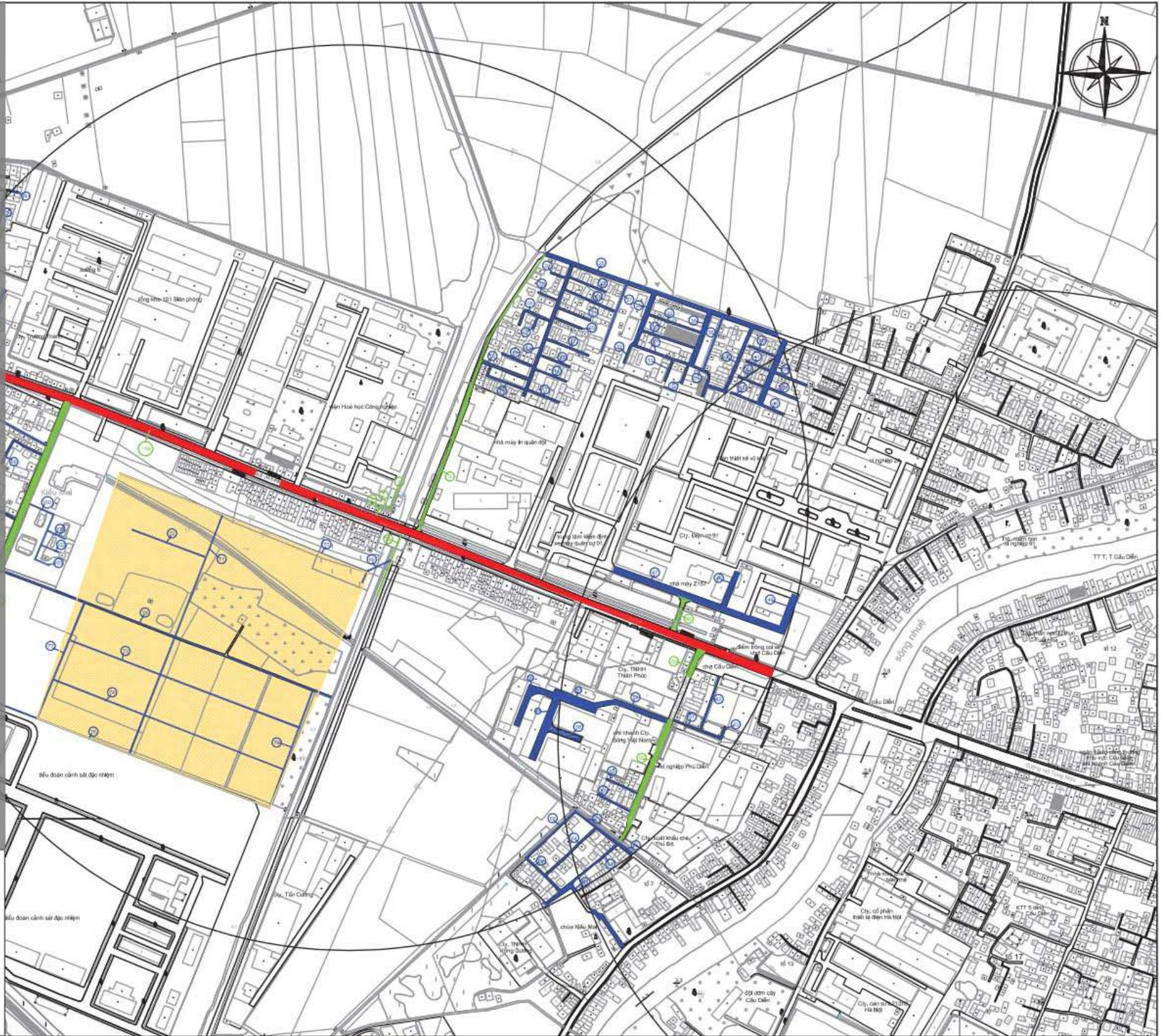


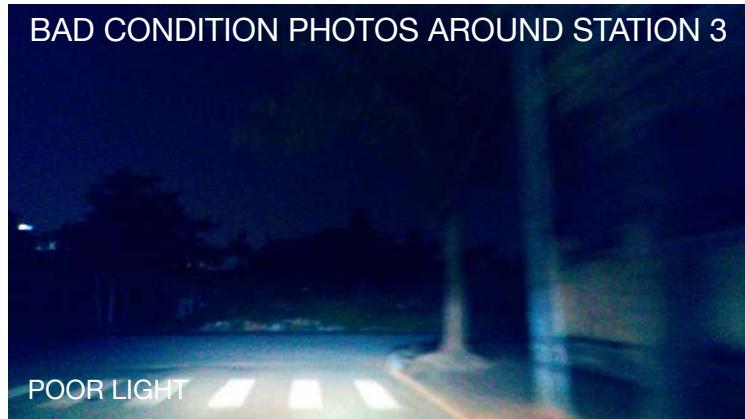
SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





95 Audit Pins within 500m radius of Phu Dien Station

A total of 95 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 3 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 3.9 on a scale of 5 is given for Station Phu Dien (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 72% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 10% is good and the remaining 18% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	2
Below Average	1.1 - 2.0	3
Average	2.1 - 3.0	12
Good	3.1 - 4.0	10
Excellent	4.1 - 5.0	68

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Phu Dien Station 3 Safety Score

Legend

 Metro Station

Safety Audits

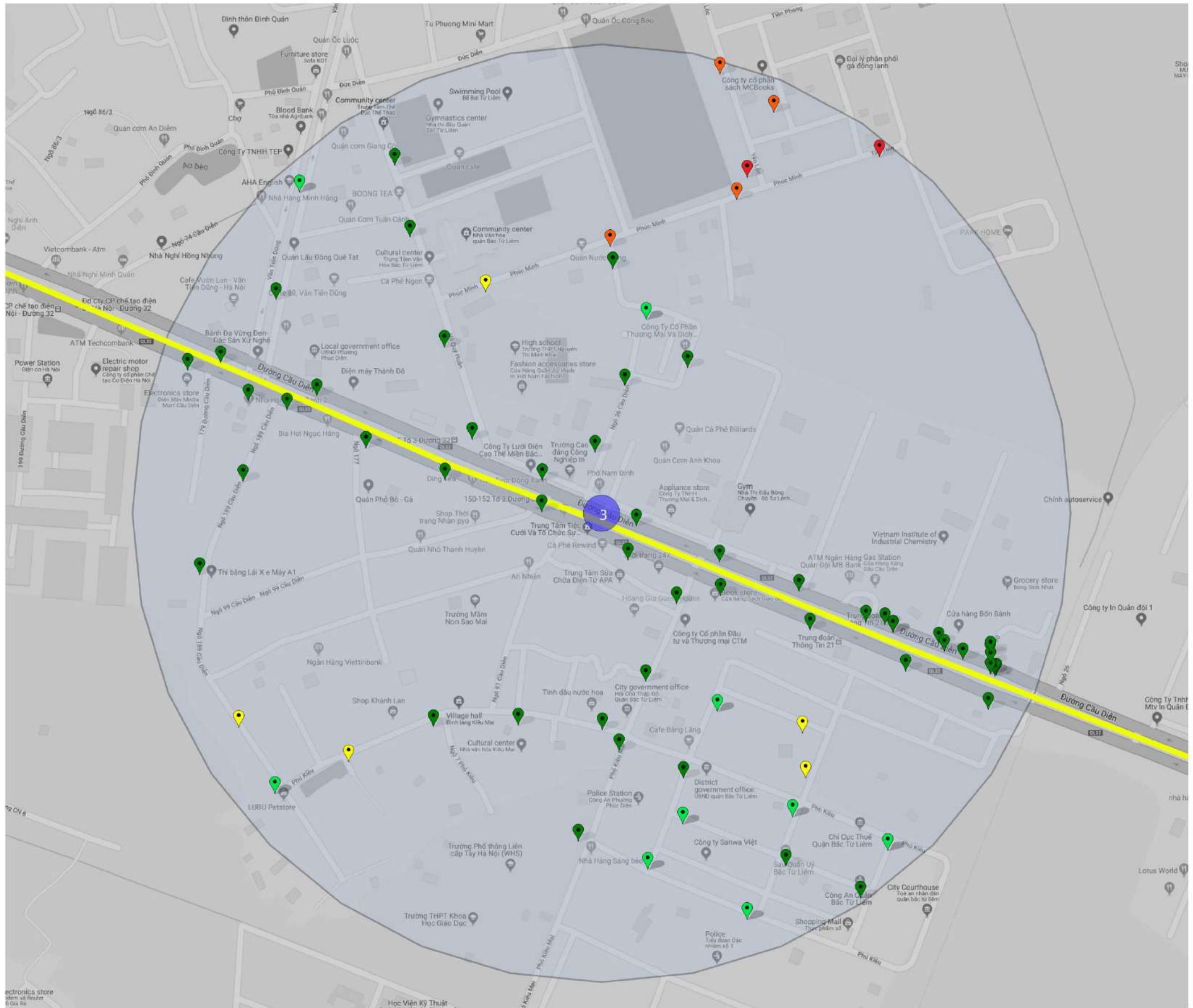
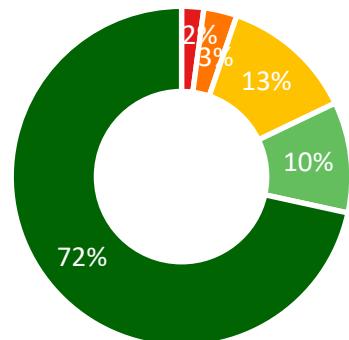
-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

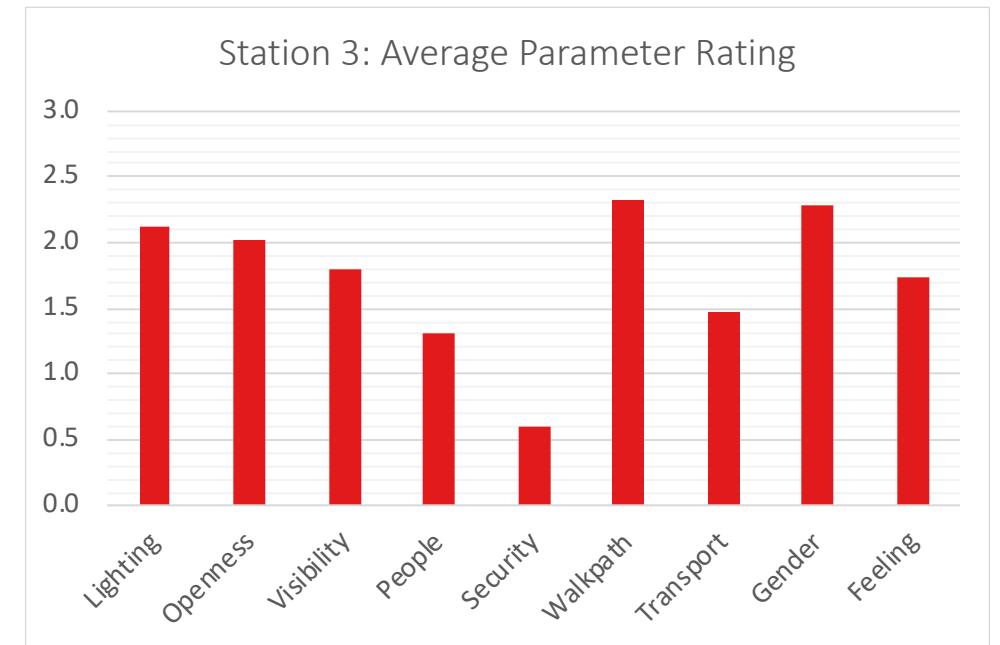
Metro Line

-  Overhead
-  500 Meter Radius

Base: Google Map

Safety Score 3.9/5





Phu Dien Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath and Gender Usage parameters have been rated the highest, followed by other parameters such as Lighting and Openness. Visibility, Transport and People parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 3, Phu Dien

**Hanoi Metro Line 3
Phu Dien
Station 3
Lighting**

Legend

- Metro Station
- Subparameter
- No Street Light
- Off Street Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Phu Dien
Station 3
Correlation
(Gender+Lighting)**

Legend

- Metro Station
- Lighting
- Poor Light
- Some Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO LIGHTING WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor street lighting is available.

Recommendation: Well light streets are of primary concern when it comes to women’s safety in public places. Even when other public infrastructures are functional but street lighting is poor or missing, women’s participation and usage of that public place will decline over time. So it is of utmost importance to provide street lighting at these identified spots around the metro station where women are present.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 03 showing all the information stored in each geo-tagged point with supporting images:

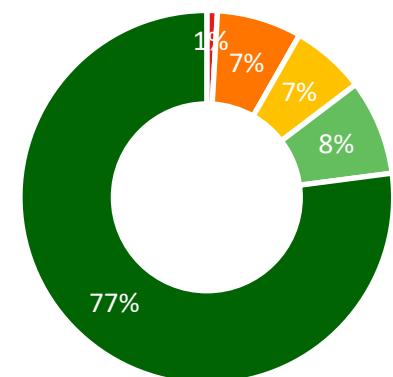
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
551731	21.0479	105.746	8/18/2018 20:23	45789	2	2	3	3	1	2	2	3	2	4.5	115345980371.png	215345980371.png	
571121	21.04842	105.7489	8/20/2018 18:10	17333	1	2	0	1	0	2	1	3	1	3	181027-10852.jpg	181033-10852.jpg	
551732	21.048	105.745	8/18/2018 20:13	45556	2	2	2	1	1	2	2	2	2	4.3	115345980421.png		
551733	21.04791	105.7453	8/18/2018 20:14	45646	2	2	2	3	1	2	3	3	2	4.5	1015345980771.jpg		
551734	21.04799	105.7452	8/18/2018 20:14	45797	2	2	1	1	0	2	1	1	2	4	1015345980851.jpg	115345980851.jpg	215345980851.jpg
571728	21.04327	105.752	09/09/18 21:01	17333	2	2	3	2	1	2	1	0	2	4.2	210138-11005.jpg	210154-11005.jpg	
551735	21.048	105.745	8/18/2018 20:25	45789	2	2	3	3	1	2	1	3	2	4.4	115345981011.png		
551736	21.048	105.745	8/18/2018 20:15	45556	2	2	1	2	1	2	2	2	2	4.3	115345981311.png	215345981311.png	
551737	21.04815	105.745	8/18/2018 20:16	45646	2	3	3	3	0	3	3	3	3	4.8	1015345981721.jpg		
551738	21.04809	105.7449	8/18/2018 20:16	45797	2	2	1	1	0	2	1	1	2	4	1015345981731.jpg	115345981731.jpg	215345981731.jpg
571732	21.04331	105.7512	09/09/18 21:00	17333	2	2	2	2	0	2	1	3	2	4.3	210042-11005.jpg	210052-11005.jpg	
551739	21.0481	105.745	8/18/2018 20:26	45789	2	2	2	2	0	3	1	3	2	4.3	115345981791.png	215345981791.png	
551740	21.0483	105.745	8/18/2018 20:16	45556	2	3	1	1	2	2	2	3	3	4.5	115345982191.png	215345982191.png	
571734	21.0433	105.7503	09/09/18 20:52	17333	3	2	3	1	0	2	1	0	1	4	205227-11005.jpg		
571736	21.04297	105.7494	09/09/18 20:52	17333	1	2	2	2	0	2	0	0	1	2.6	205253-11005.jpg		
571737	21.04266	105.7487	09/09/18 20:59	17333	3	2	2	1	0	2	0	0	1	3	205913-11005.jpg		
571739	21.0433	105.7483	09/09/18 20:56	17333	2	2	2	1	0	2	0	0	1	2.6	205637-11005.jpg		
571215	21.04759	105.7455	8/20/2018 18:50	17333	3	2	2	1	1	2	2	3	2	4.4	185006-10855.jpg		
571218	21.04698	105.7469	8/21/2018 20:46	17333	3	2	1	1	0	3	3	3	2	4.4	204628-10866.jpg		
571221	21.04642	105.7484	8/21/2018 20:47	17333	3	2	3	2	0	2	1	3	2	4.4	204701-10866.jpg	204707-10866.jpg	
571224	21.04564	105.7483	8/21/2018 20:47	17333	2	2	2	1	0	2	1	3	2	4.2	204755-10866.jpg	204825-10866.jpg	
571228	21.04475	105.7479	8/21/2018 20:49	17333	3	1	2	1	0	2	1	3	2	4.2	204928-10866.jpg	205216-10866.jpg	
571619	21.04678	105.7481	8/21/2018 20:15	17333	3	2	3	2	0	3	2	2	2	4.4	201507-10864.jpg		
571621	21.04735	105.7469	8/21/2018 20:15	17333	3	2	3	1	1	3	3	3	2	4.6	201527-10864.jpg		
571623	21.04768	105.7458	09/09/18 20:15	17333	3	2	3	2	0	3	2	2	2	4.4	201502-11004.jpg		
571409	21.04592	105.7519	09/09/18 19:55	17333	3	2	2	1	1	2	2	3	2	4.4	195545-11003.jpg		
571626	21.04814	105.7447	8/21/2018 20:16	17333	3	2	3	1	1	3	2	3	2	4.5	201602-10864.jpg	201606-10864.jpg	
571410	21.04656	105.7522	09/09/18 19:55	17333	2	2	1	1	0	2	2	3	2	4.2	195519-11003.jpg		
572039	21.04565	105.7514	8/20/2018 17:50	17333	3	2	3	1	1	3	3	3	2	4.6	175025-10851.jpg		
571411	21.04674	105.7529	09/09/18 20:05	17333	3	2	1	1	0	2	1	3	2	4.2	200538-11004.jpg		
572040	21.04522	105.7524	8/20/2018 17:50	17333	3	2	3	1	0	3	2	3	2	4.4	175003-10851.jpg	174958-10851.jpg	
571412	21.0472	105.7525	09/09/18 20:06	17333	1	2	1	1	0	2	1	3	1	3.5	200628-11004.jpg		
572041	21.04487	105.7532	8/20/2018 17:49	17333	3	2	2	1	0	3	2	3	2	4.4	174941-10851.jpg	174947-10851.jpg	
571413	21.04768	105.7521	09/09/18 20:03	17333	2	2	1	1	0	2	1	3	2	4.1	200317-11004.jpg		
572042	21.04459	105.754	8/20/2018 17:49	17333	3	2	1	1	1	3	2	3	2	4.4	174929-10851.jpg	174934-10851.jpg	
570868	21.04769	105.7453	8/20/2018 18:49	17333	3	2	2	1	1	3	2	3	2	4.4	184959-10855.jpg	185006-10855.jpg	
572043	21.0443	105.7547	8/20/2018 17:49	17333	3	2	3	1	1	3	3	3	2	4.6	174913-10851.jpg	174919-10851.jpg	
570869	21.04737	105.7461	8/20/2018 18:50	17333	3	2	2	1	1	3	3	3	2	4.5	185015-10855.jpg	185010-10855.jpg	
572044	21.04402	105.7555	8/20/2018 17:49	17333	3	2	2	1	0	3	3	3	2	4.4	174902-10851.jpg	174854-10851.jpg	
570870	21.04702	105.7469	8/20/2018 18:50	17333	3	2	2	1	1	3	3	3	2	4.5	185025-10855.jpg		
572045	21.04447	105.7528	NULL	17333	3	2	2	2	0	2	2	2	2	4.3	210036-10869.jpg	210044-10869.jpg	
570871	21.04671	105.7478	8/20/2018 18:50	17333	3	2	3	1	0	3	2	3	2	4.4	185029-10855.jpg	185034-10855.jpg	
570872	21.04633	105.7488	8/20/2018 18:50	17333	3	2	3	1	0	3	1	3	2	4.4	185044-10855.jpg	185051-10855.jpg	
572047	21.04373	105.7525	8/21/2018 21:00	17333	3	2	3	2	1	2	1	2	2	4.4	210056-10869.jpg	210104-10869.jpg	

Fourth Station of Hanoi Metro Line 3

Cau Dien Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, walkpaths was poor or missing and parameters like transport, people and security needed more attention. In the following data analysis of this station it can understood how to use these findings to improve accessibility and mobility for women and girls.

CAU DIEN

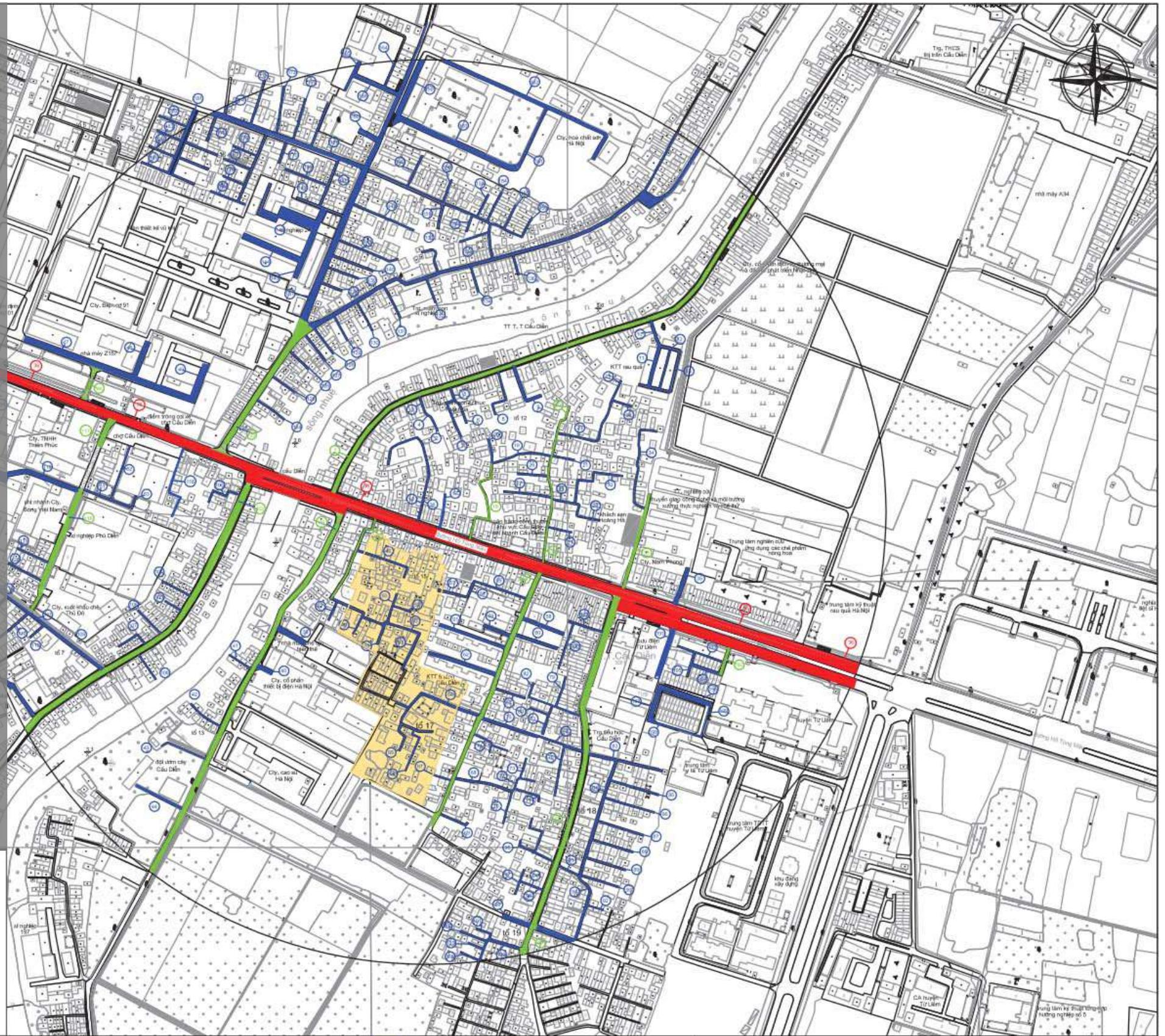
Safety Score 3.9/5



SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

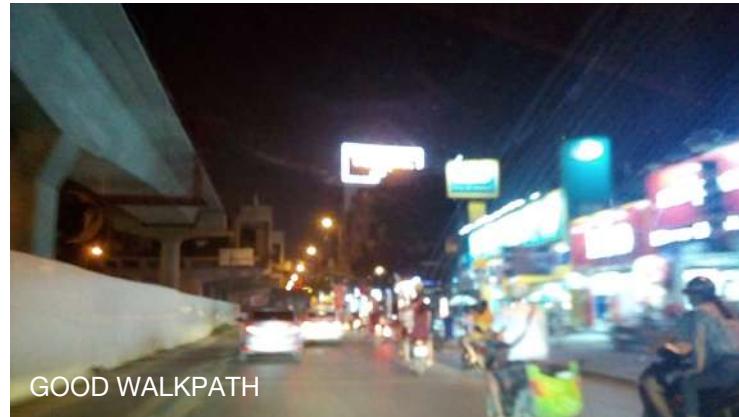
MAP SOURCE:

Engineering Design Report, 18 APR 2014



BAD CONDITION PHOTOS AROUND STATION 4

GOOD CONDITION PHOTOS AROUND STATION 4



109 Audit Pins within 500m radius of Cau Dien Station

A total of 109 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 4 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 3.9 on a scale of 5 is given for Station Cau Dien (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 77% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 8% is good and the remaining 15% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	1
Below Average	1.1 - 2.0	8
Average	2.1 - 3.0	7
Good	3.1 - 4.0	9
Excellent	4.1 - 5.0	84

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Cau Dien Station 4 Safety Score

Legend

 Metro Station

Safety Audits

 Below Average

 Average

 Good

 Excellent

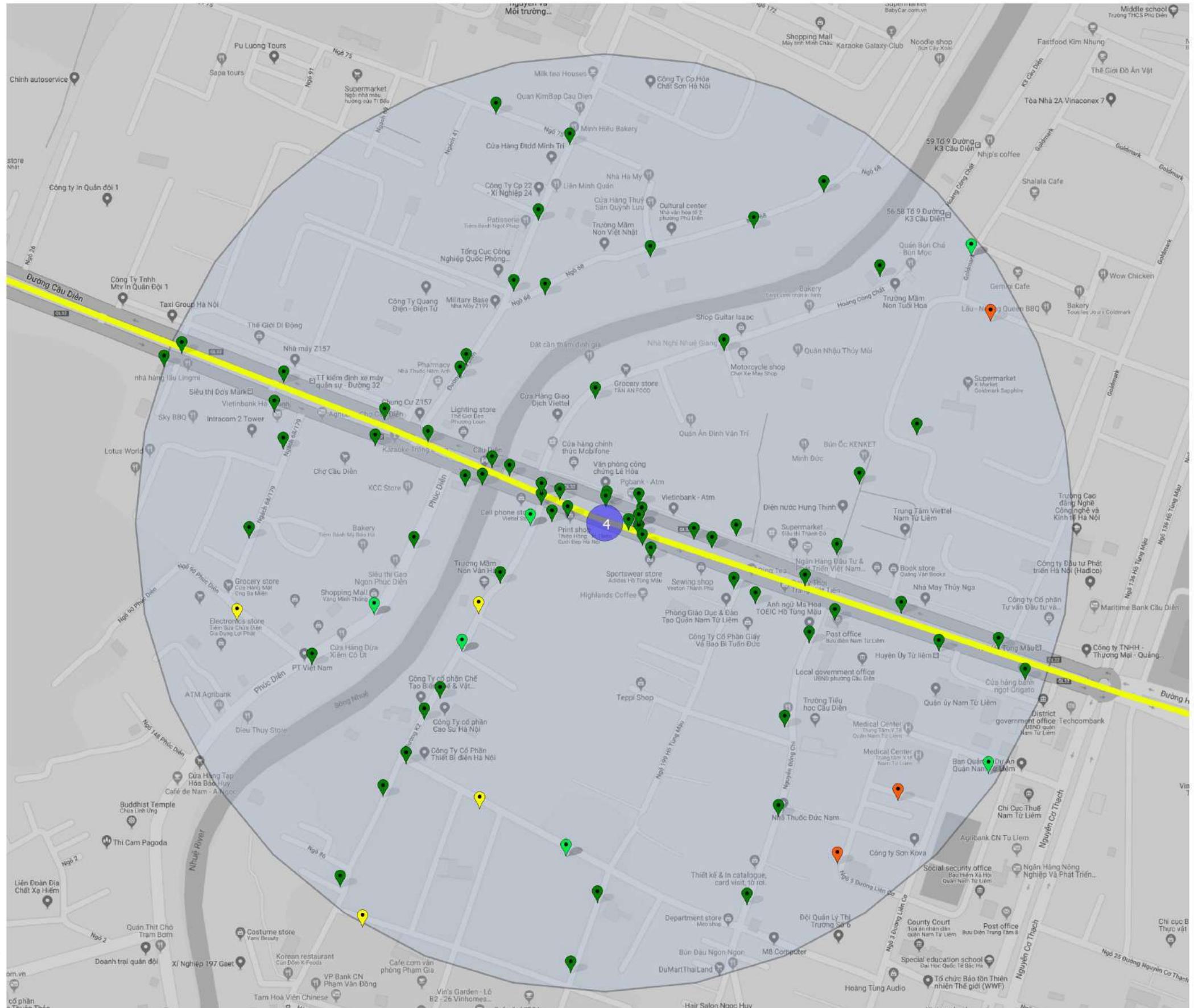
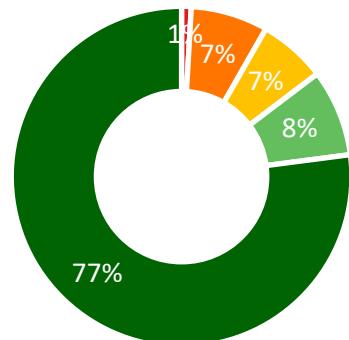
Metro Line

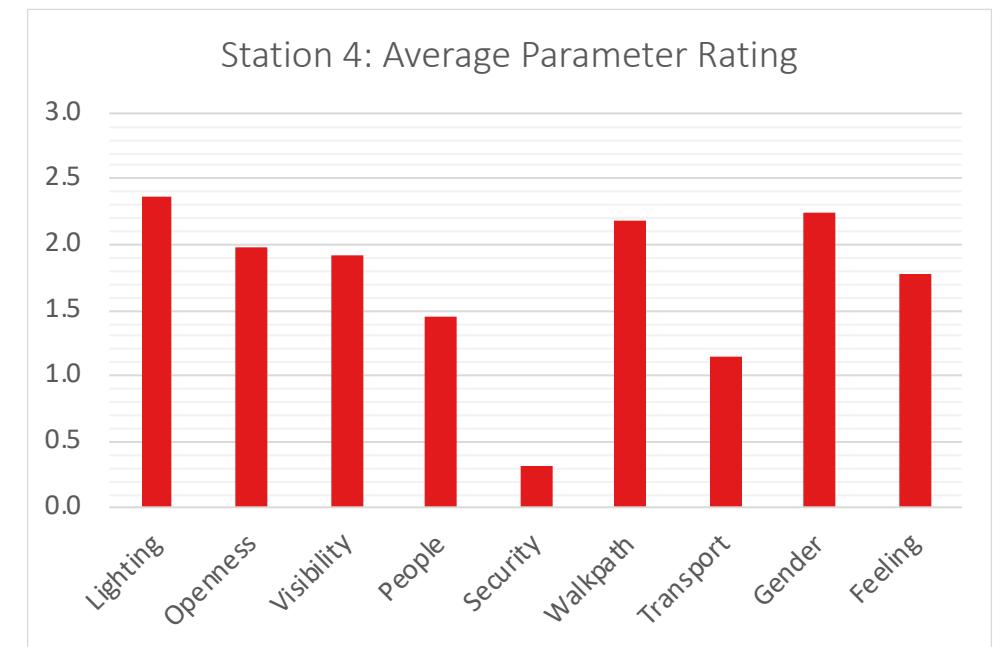
 Overhead

 500 Meter Radius

Base: Google Map

Safety Score 3.9/5





Cau Dien Station:

Average Parameter Rating Graph

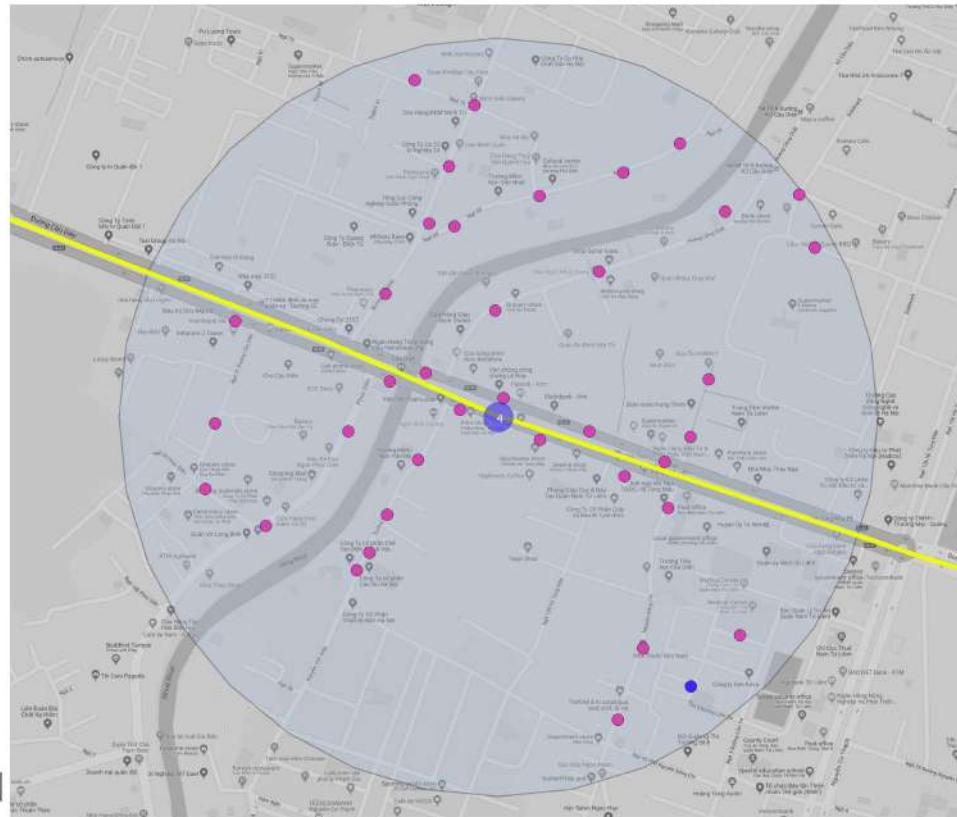
The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Lighting parameter has been rated the highest, followed by other parameters such as Walkpath and Gender Usage. Openness, Visibility, People and Transport parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 4, Cau Dien

**Hanoi Metro Line 3
Cau Dien
Station 4
Walkpath**

Legend

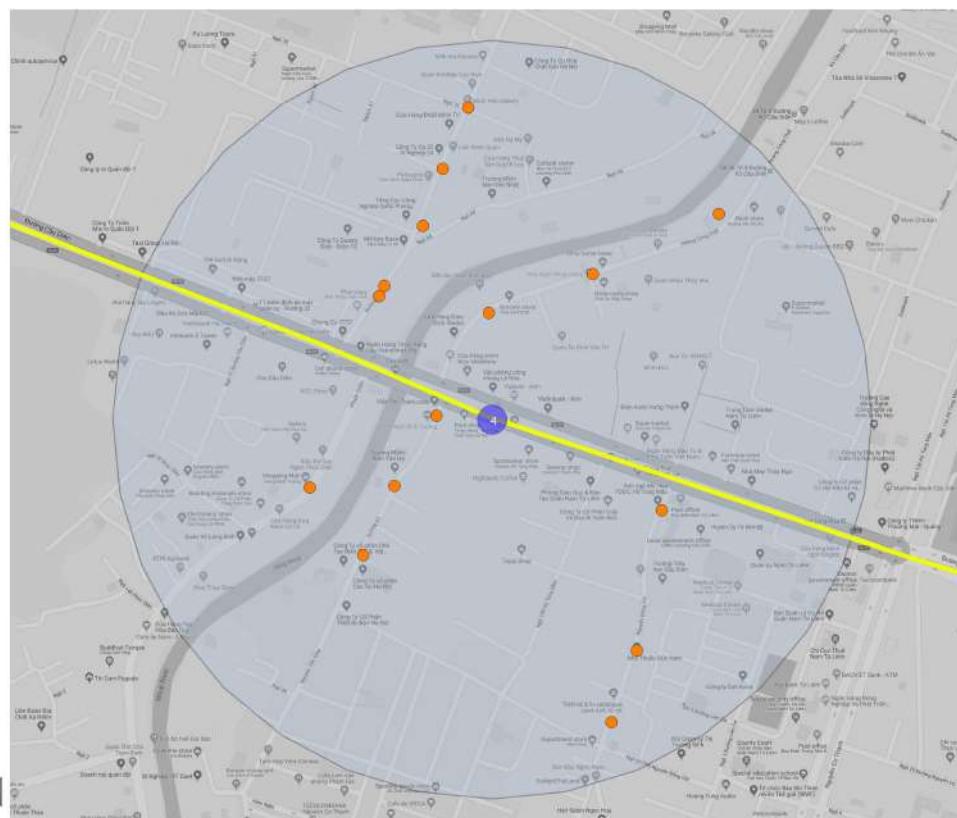
- Metro Station
- Subparameter
 - No Pavement
 - Other Blocking
- Metro Line
 - Overhead
 - 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Cau Dien
Station 4
Correlation
(Gender+Walkpath)**

Legend

- Metro Station
- Walkpath
 - Poor
- Metro Line
 - Overhead
 - 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

PUBLIC TRANSPORT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor quality walkpath is available.

Recommendation: Building high quality pavements both in terms of design and material, followed by regular maintenance, improves walkability and accessibility for all. Pedestrian safety in general and women safety in particular is associated with good walking surfaces, obstruction free routes and clear sightlines while walking. Hence it is imperative to build good quality pavements at the identified spots.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 04 showing all the information stored in each geo-tagged point with supporting images:

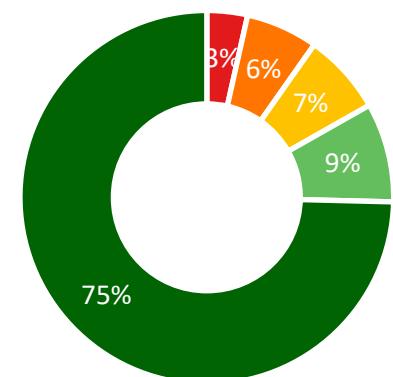
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
571723	21.04088	105.7631	8/25/2018 18:39	17333	3	2	3	2	0	3	1	2	2	4.4	183958-10913.jpg	183952-10913.jpg	
570748	21.03927	105.7645	8/21/2018 21:27	17333	1	2	2	2	0	2	1	3	2	4.2	212746-10869.jpg	212754-10869.jpg	
571725	21.04209	105.7558	09/09/18 21:06	17333	1	2	1	0	0	2	1	0	1	1.6	210639-11005.jpg		
571727	21.04124	105.7621	8/25/2018 18:39	17333	2	2	3	2	0	3	1	2	2	4.3	183926-10913.jpg	183938-10913.jpg	
570754	21.03841	105.7644	8/21/2018 21:27	17333	2	2	3	2	0	1	1	3	2	4.3	212708-10869.jpg	212714-10869.jpg	
571730	21.04309	105.7563	09/09/18 21:06	17333	1	2	1	2	0	2	2	2	2	4.1	210607-11005.jpg		
571731	21.04065	105.7616	8/21/2018 21:19	17333	2	2	3	1	1	2	1	3	2	4.3	211935-10869.jpg		
570938	21.04241	105.7626	8/21/2018 20:00	17333	3	2	3	2	0	1	0	2	2	4.2	200002-10863.jpg	195956-10863.jpg	
570760	21.03757	105.7641	8/21/2018 21:26	17333	2	2	3	2	0	1	0	3	2	4.2	212644-10869.jpg	212639-10869.jpg	
571733	21.04	105.7612	8/21/2018 21:20	17333	2	2	1	1	0	2	0	3	1	3.5	212001-10869.jpg	211955-10869.jpg	
571735	21.03934	105.7608	8/21/2018 21:20	17333	3	2	2	1	0	2	0	3	2	4.2	212012-10869.jpg	212016-10869.jpg	
570943	21.04288	105.7639	8/21/2018 20:00	17333	2	2	3	2	0	1	2	2	2	4.3	200040-10863.jpg	200048-10863.jpg	
571738	21.03892	105.7606	09/09/18 21:12	17333	3	2	1	2	0	3	0	2	2	4.2	211225-11006.jpg		
571740	21.0385	105.7614	09/09/18 21:17	17333	3	2	1	0	0	3	0	0	1	2.6	211744-11006.jpg		
571741	21.03803	105.7623	09/09/18 21:16	17333	3	2	1	0	1	3	0	0	1	3	211626-11006.jpg		
570949	21.04359	105.7655	8/21/2018 20:01	17333	2	2	3	2	0	1	2	2	2	4.3	200115-10863.jpg	200121-10863.jpg	
571742	21.03759	105.7626	09/09/18 21:15	17333	3	2	1	1	0	3	0	3	2	4.2	211512-11006.jpg		
571743	21.03692	105.7623	09/09/18 21:14	17333	3	2	2	2	0	3	0	2	2	4.3	211438-11006.jpg		
571745	21.03737	105.7602	09/09/18 21:13	17333	3	2	1	0	0	2	0	0	1	2	211312-11006.jpg		
570955	21.04454	105.7663	8/21/2018 20:01	17333	3	2	2	1	0	1	3	3	2	4.3	200151-10863.jpg	200157-10863.jpg	
570972	21.04002	105.7667	8/20/2018 17:19	17333	3	2	3	1	0	3	3	3	2	4.5	171906-10851.jpg		
570828	21.03774	105.7599	8/21/2018 21:20	17333	3	2	1	1	0	3	0	3	2	4.2	212049-10869.jpg	212053-10869.jpg	
570977	21.04036	105.7657	8/20/2018 17:19	17333	3	2	3	1	1	3	2	3	2	4.5	171920-10851.jpg	171916-10851.jpg	
570979	21.04412	105.7667	8/21/2018 19:53	17333	2	2	2	0	1	2	1	0	1	3	195330-10863.jpg	195324-10863.jpg	
570833	21.0386	105.7604	8/21/2018 21:20	17333	3	2	0	2	0	3	0	3	2	4.2	212032-10869.jpg	212036-10869.jpg	
570983	21.04062	105.7647	8/20/2018 17:19	17333	3	2	3	1	1	3	1	3	2	4.4	171931-10851.jpg	171936-10851.jpg	
570985	21.04316	105.7666	8/21/2018 19:55	17333	3	2	1	0	0	1	0	0	1	1.6	195506-10863.jpg	195500-10863.jpg	
571219	21.03882	105.7666	8/22/2018 20:12	17333	1	2	0	1	0	3	1	3	1	3.5	201232-10876.jpg		
570838	21.03955	105.761	8/21/2018 21:20	17333	3	2	2	2	0	1	0	2	2	4.1	212012-10869.jpg	212007-10869.jpg	
571222	21.03857	105.7657	8/22/2018 20:03	17333	1	2	0	0	0	2	1	0	1	1.3	200356-10876.jpg		
570989	21.04098	105.7638	8/20/2018 17:19	17333	3	2	3	1	1	3	1	3	2	4.4	171948-10851.jpg	171953-10851.jpg	
571225	21.03796	105.765	8/22/2018 20:04	17333	2	1	1	1	0	2	0	0	1	1.6	200445-10876.jpg	200439-10876.jpg	
570995	21.04138	105.7627	8/20/2018 17:20	17333	3	2	3	1	1	3	1	3	2	4.4	172027-10851.jpg	172034-10851.jpg	
570845	21.04037	105.7614	8/21/2018 21:19	17333	2	2	0	2	0	1	0	2	1	2.6	211955-10869.jpg	211949-10869.jpg	
570847	21.0412	105.7619	8/21/2018 21:19	17333	2	2	1	1	0	1	1	3	1	3.5	211921-10869.jpg		
571001	21.04167	105.7617	8/20/2018 17:20	17333	3	2	3	1	0	3	1	3	2	4.4	172059-10851.jpg	172108-10851.jpg	
570850	21.04157	105.7612	8/21/2018 21:18	17333	3	2	3	1	0	3	1	3	2	4.4	211847-10869.jpg	185331-10855.jpg	
571007	21.042	105.7608	8/20/2018 17:21	17333	3	2	2	1	0	3	2	3	2	4.4	172122-10851.jpg		
570854	21.04098	105.7607	8/21/2018 21:18	17333	1	2	2	1	0	2	1	3	2	4.1	211827-10869.jpg		
571013	21.04274	105.7612	8/20/2018 17:22	17333	3	2	2	2	0	1	2	2	2	4.3	172208-10851.jpg		
570857	21.04035	105.7603	8/21/2018 21:18	17333	1	2	2	2	0	1	1	2	1	3.5	211814-10869.jpg		
571019	21.04341	105.762	8/20/2018 17:22	17333	1	2	2	2	0	2	1	2	2	4.1	172248-10851.jpg	172255-10851.jpg	
570860	21.03987	105.7596	8/21/2018 21:17	17333	2	2	3	2	0	3	1	0	2	4.2	211754-10869.jpg		
571025	21.04377	105.7631	8/20/2018 17:23	17333	2	2	2	2	0	2	1	2	2	4.2	172342-10851.jpg	172358-10851.jpg	

Fifth Station of Hanoi Metro Line 3

Le Duc Tho Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting was poor or missing and parameters like transport, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

LE DUC THO

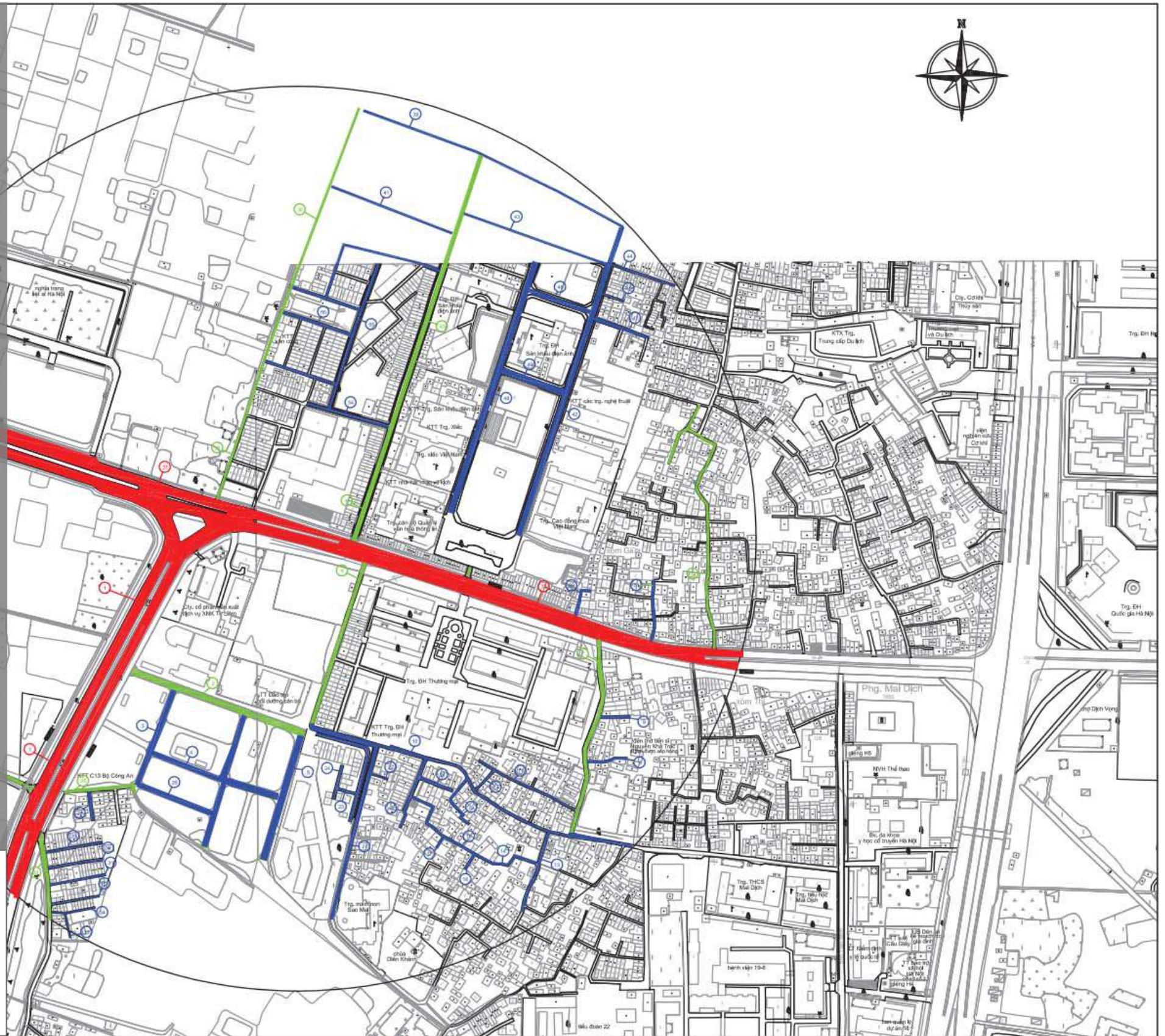
Safety Score 3.9/5



SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014





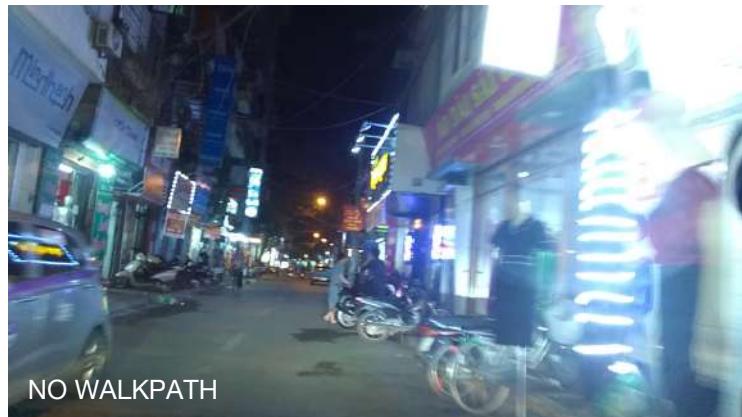
BAD CONDITION PHOTOS AROUND STATION 5

POOR LIGHT



GOOD CONDITION PHOTOS AROUND STATION 5

BRIGHT LIGHT



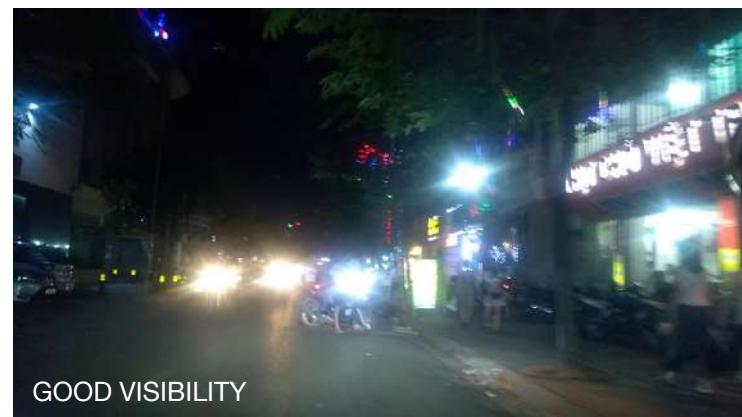
NO WALKPATH



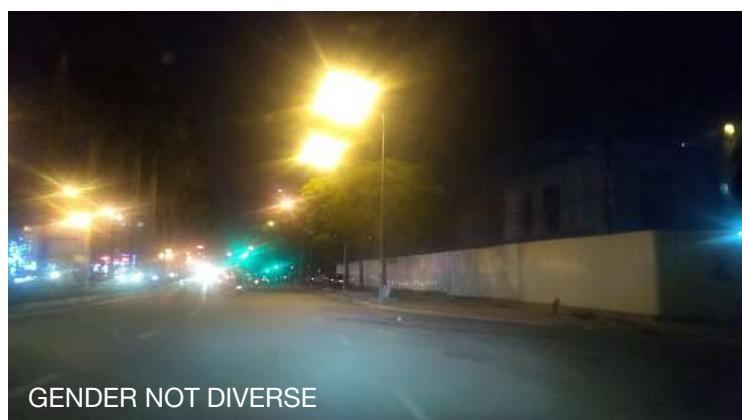
GOOD WALKPATH



NO VISIBILITY



GOOD VISIBILITY



GENDER NOT DIVERSE



GENDER FAIRLY DIVERSE

256 Audit Pins within 500m radius of Le Duc Tho Station

A total of 256 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 5 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 3.9 on a scale of 5 is given for Station Le Duc Tho (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 75% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 9% is good and the remaining 16% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	9
Below Average	1.1 - 2.0	16
Average	2.1 - 3.0	18
Good	3.1 - 4.0	22
Excellent	4.1 - 5.0	191

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Le Duc Tho Station 5 Safety Score

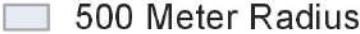
Legend

 Metro Station

Safety Audits

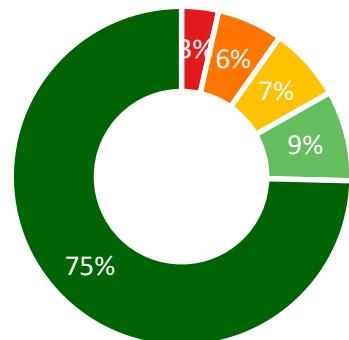
-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

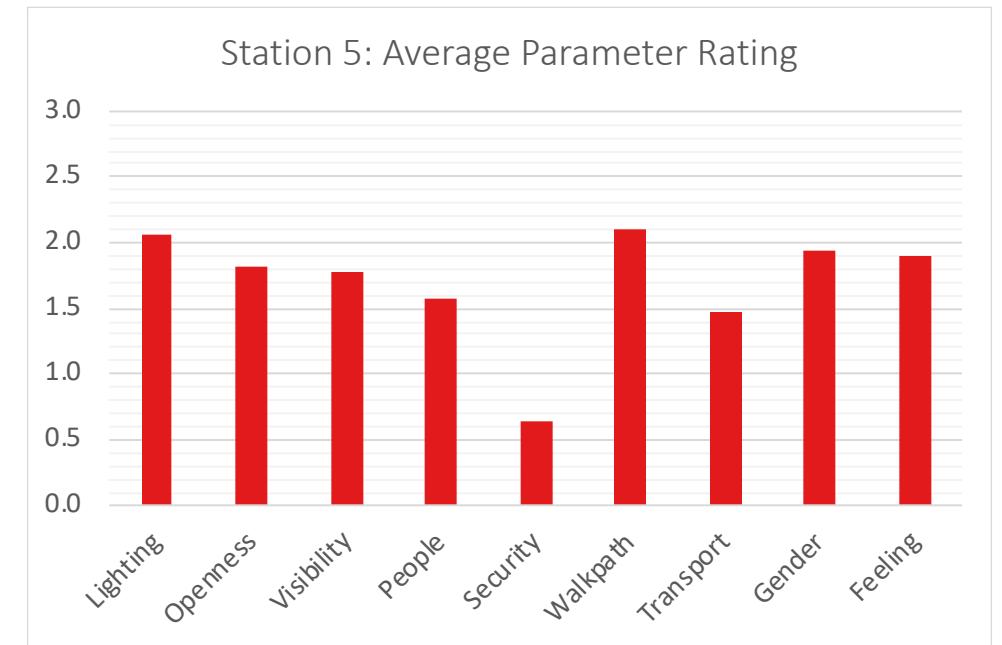
Metro Line

-  Overhead
-  500 Meter Radius

Base: Google Map

Safety Score 3.9/5





Le Duc Tho Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath and Lighting parameters have been rated the highest, followed by other parameters such as Gender Usage, Openness and Visibility. People and Transport parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 5, Le Duc Tho

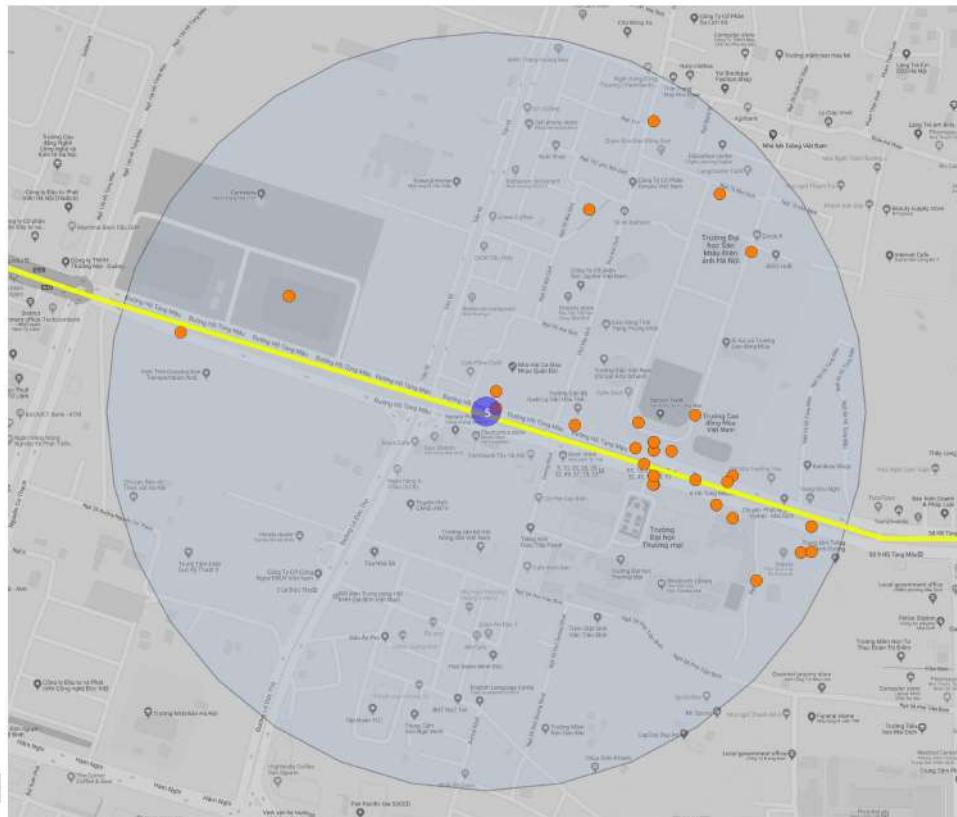
**Hanoi Metro Line 3
Le Duc Tho
Station 5
Lighting**

- Legend**
- Metro Station
 - Subparameter**
 - One Sided Street Light
 - Metro Line**
 - Overhead
 - 500 Meter Radius
 - Base: Google Map



**Hanoi Metro Line 3
Le Duc Tho
Station 5
Correlation
(Gender+Lighting)**

- Legend**
- Metro Station
 - Lighting**
 - Poor Light
 - Some Light
 - Metro Line**
 - Overhead
 - 500 Meter Radius
 - Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO LIGHTING WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor street lighting is available.

Recommendation: Well light streets are of primary concern when it comes to women’s safety in public places. Even when other public infrastructures are functional but street lighting is poor or missing, women’s participation and usage of that public place will decline over time. So it is of utmost importance to provide street lighting at these identified spots around the metro station where women are present.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 05 showing all the information stored in each geo-tagged point with supporting images:

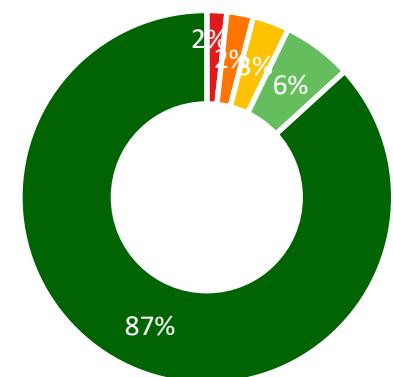
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
552189	21.041	105.775	8/22/2018 19:09	22601	1	0	1	1	0	1	1	1	1	1.3	115349397501.png	215349397501.png	
571463	21.036	105.772	8/22/2018 20:26	17333	3	2	2	1	0	3	2	0	2	4.2	202637-10876.jpg	202631-10876.jpg	
552191	21.0365	105.777	8/22/2018 20:09	45915	1	2	1	1	0	0	0	0	1	0.9	115349397721.png		
571467	21.0361	105.7731	8/22/2018 20:25	17333	2	2	2	1	0	2	1	0	1	3	202522-10876.jpg	202516-10876.jpg	
552194	21.0397	105.775	8/22/2018 19:10	21048	1	2	0	1	1	2	1	1	1	2.6	115349398581.png	215349398581.png	
552196	21.0411	105.775	8/22/2018 19:11	22601	2	1	2	1	0	0	1	1	3	4	115349398821.png		
571471	21.03673	105.7734	8/22/2018 20:32	17333	2	2	3	2	0	3	2	3	2	4.4	203227-10876.jpg	203233-10876.jpg	
552197	21.03967	105.7753	8/22/2018 19:11	45911	1	1	1	1	0	3	0	0	1	1.6	015349398851.jpg		
552198	21.0365	105.777	8/22/2018 20:11	45915	2	1	1	1	0	0	0	1	2	2			
571475	21.03753	105.7736	8/22/2018 20:33	17333	3	2	3	2	1	3	2	3	2	4.6	203306-10876.jpg	203300-10876.jpg	
571480	21.03587	105.7738	8/22/2018 20:24	17333	2	2	3	2	0	1	1	0	1	3.5	202442-10876.jpg	202436-10876.jpg	
552203	21.04035	105.7757	8/22/2018 19:13	45911	1	1	3	1	0	2	0	1	2	3.5	015349400351.jpg	115349400351.jpg	
571485	21.03489	105.7736	8/22/2018 20:24	17333	2	2	2	2	0	2	1	0	1	3.5	202410-10876.jpg	202403-10876.jpg	
552205	21.0416	105.775	8/22/2018 19:14	22601	1	1	1	1	0	1	1	2	3	4	115349400811.png	215349400811.png	315349400811.png
552206	21.0365	105.777	8/22/2018 20:14	45915	2	1	2	1	0	1	0	1	2	3			
552210	21.0409	105.776	8/22/2018 19:15	21048	2	2	1	1	1	2	1	2	2	4.1	115349401671.png	215349401671.png	
552211	21.04074	105.7758	8/22/2018 19:16	45911	1	1	2	1	0	0	0	2	2	2.6	015349402051.jpg	115349402051.jpg	215349402051.jpg
552214	21.0421	105.775	8/22/2018 19:17	22601	3	2	3	3	0	1	0	3	3	4.4			
570935	21.03775	105.7745	8/20/2018 17:16	17333	3	2	3	1	0	3	2	3	2	4.4	171606-10851.jpg	171558-10851.jpg	
552219	21.04088	105.7766	8/22/2018 19:20	45911	1	0	1	0	0	2	0	0	1	0.8	015349404381.jpg	115349404381.jpg	
570937	21.03804	105.7735	8/20/2018 17:16	17333	3	2	1	1	0	3	2	3	2	4.3	171621-10851.jpg	171626-10851.jpg	
570942	21.0383	105.7725	8/20/2018 17:17	17333	2	2	0	1	0	3	1	3	2	4.1	171731-10851.jpg	171739-10851.jpg	
552225	21.0402	105.776	8/22/2018 19:23	21048	2	2	1	1	1	2	2	1	2	4.1	115349406521.png	215349406521.png	
552231	21.0372	105.7751	8/22/2018 19:25	45953	2	3	3	2	3	3	3	3	3	4.9	015349407381.jpg	115349407381.jpg	215349407381.jpg
552232	21.03914	105.776	8/22/2018 19:26	45911	1	1	2	1	0	2	0	1	2	3	015349407771.jpg	115349407771.jpg	
570948	21.03859	105.7715	8/20/2018 17:17	17333	2	2	1	1	0	3	1	3	2	4.2	171754-10851.jpg		
552234	21.03725	105.7747	8/22/2018 19:26	45930	3	2	2	2	2	3	2	3	3	4.7	015349407901.jpg		
552236	21.0386	105.776	8/22/2018 19:27	21048	1	2	0	1	1	2	2	1	1	3	115349409001.png	215349409001.png	
552237	21.0366	105.777	8/22/2018 19:28	45929	2	2	2	2	0	2	1	2	2	4.2	115349409021.png		
570954	21.03887	105.7705	8/20/2018 17:18	17333	2	2	0	1	0	3	1	3	2	4.1	171802-10851.jpg	171806-10851.jpg	
552239	21.0366	105.777	8/22/2018 19:28	45910	2	1	2	2	2	3	3	3	2	4.5	115349409261.png	215349409261.png	
552240	21.0378	105.775	8/22/2018 20:00	45915	1	2	2	2	1	3	2	1	2	4.3	115349415581.png		
553195	21.03805	105.7744	9/13/2018 12:38	46277	3	2	3	3	2	3	3	3	2	4.8	015368171351.jpg		
552241	21.038	105.775	8/22/2018 20:02	45915	1	2	2	1	1	3	2	1	2	4.2	115349415611.png		
553196	21.03839	105.7725	9/13/2018 12:40	46277	2	3	3	3	1	0	2	3	2	4.4	015368172431.jpg		
552242	21.0383	105.775	8/22/2018 20:05	45915	2	2	2	2	1	3	2	1	2	4.3	115349415641.png		
553197	21.0393	105.7689	9/13/2018 12:42	46277	3	3	3	3	2	0	1	2	3	4.6	015368173561.jpg		
570960	21.0393	105.7692	8/20/2018 17:18	17333	2	2	0	1	0	3	1	3	2	4.1	171822-10851.jpg	171814-10851.jpg	
552243	21.0391	105.775	8/22/2018 20:08	45915	2	2	3	2	1	3	1	1	2	4.3	115349415661.png		
552244	21.0401	105.776	8/22/2018 20:13	45915	1	2	2	1	2	3	0	1	2	4.1	115349415691.png	215349415691.png	
552245	21.0407	105.776	8/22/2018 20:17	45915	2	3	3	2	0	2	1	2	2	4.3	115349415721.png	215349415721.png	
570966	21.03961	105.7679	8/20/2018 17:18	17333	3	2	3	1	0	3	2	3	2	4.4	171843-10851.jpg	171850-10851.jpg	
552247	21.0394	105.776	8/22/2018 20:26	45915	2	2	2	1	2	3	0	1	2	4.2	115349415781.png	215349415781.png	
552248	21.0378	105.775	8/22/2018 20:30	45915	1	3	2	2	1	3	2	2	2	4.4	115349415811.png	215349415811.png	

Sixth Station of Hanoi Metro Line 3

National University Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting was poor or missing and parameters like transport, openness and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

NATIONAL UNIVERSITY

Safety Score 4.2/5

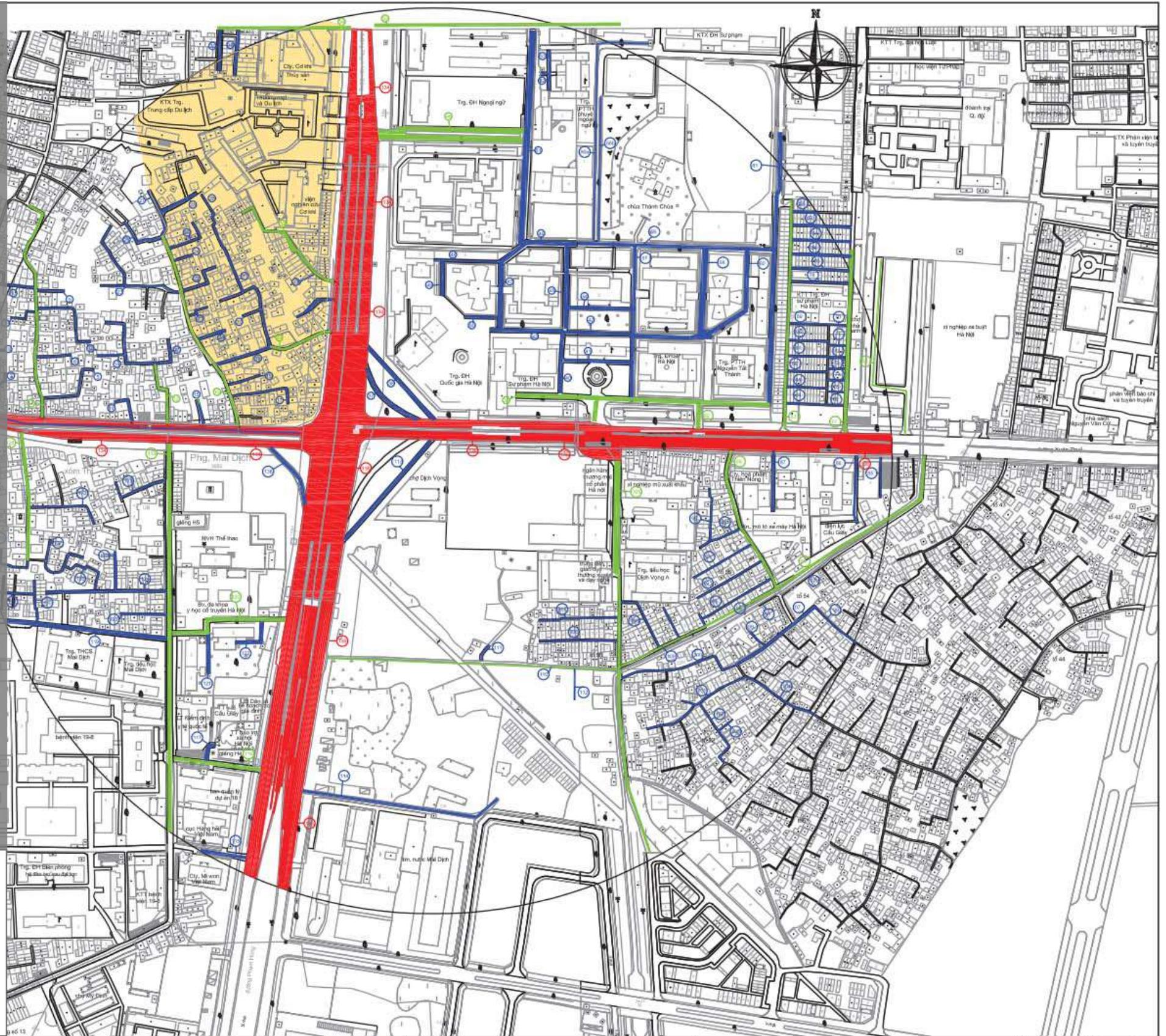


SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





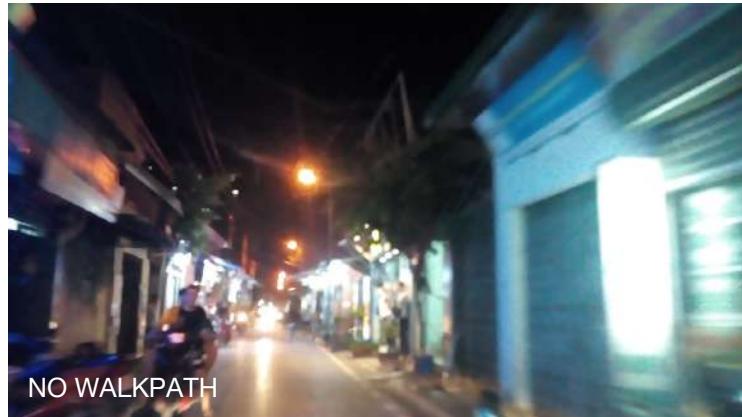
BAD CONDITION PHOTOS AROUND STATION 6

POOR LIGHT



GOOD CONDITION PHOTOS AROUND STATION 6

BRIGHT LIGHT



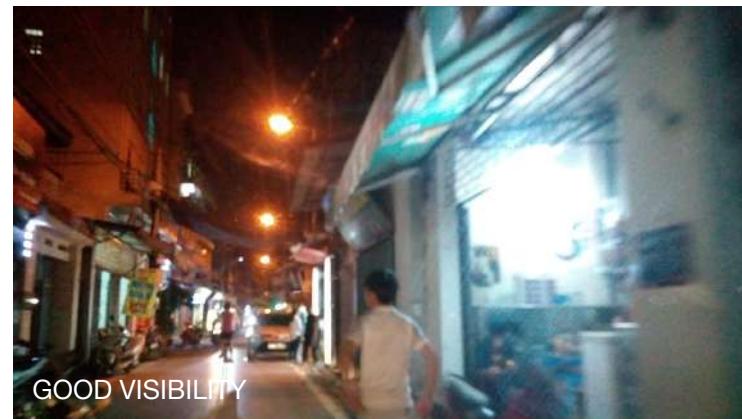
NO WALKPATH



GOOD WALKPATH



NO VISIBILITY



GOOD VISIBILITY



GENDER NOT DIVERSE



GENDER FAIRLY DIVERSE

348 Audit Pins within 500m radius of National University Station

A total of 348 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 6 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.2 on a scale of 5 is given for Station National University (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 87% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where 6% is good and the remaining 7% is divided between average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	6
Below Average	1.1 - 2.0	8
Average	2.1 - 3.0	11
Good	3.1 - 4.0	21
Excellent	4.1 - 5.0	302

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 National University Station 6 Safety Score

Legend

 Metro Station

Safety Audits

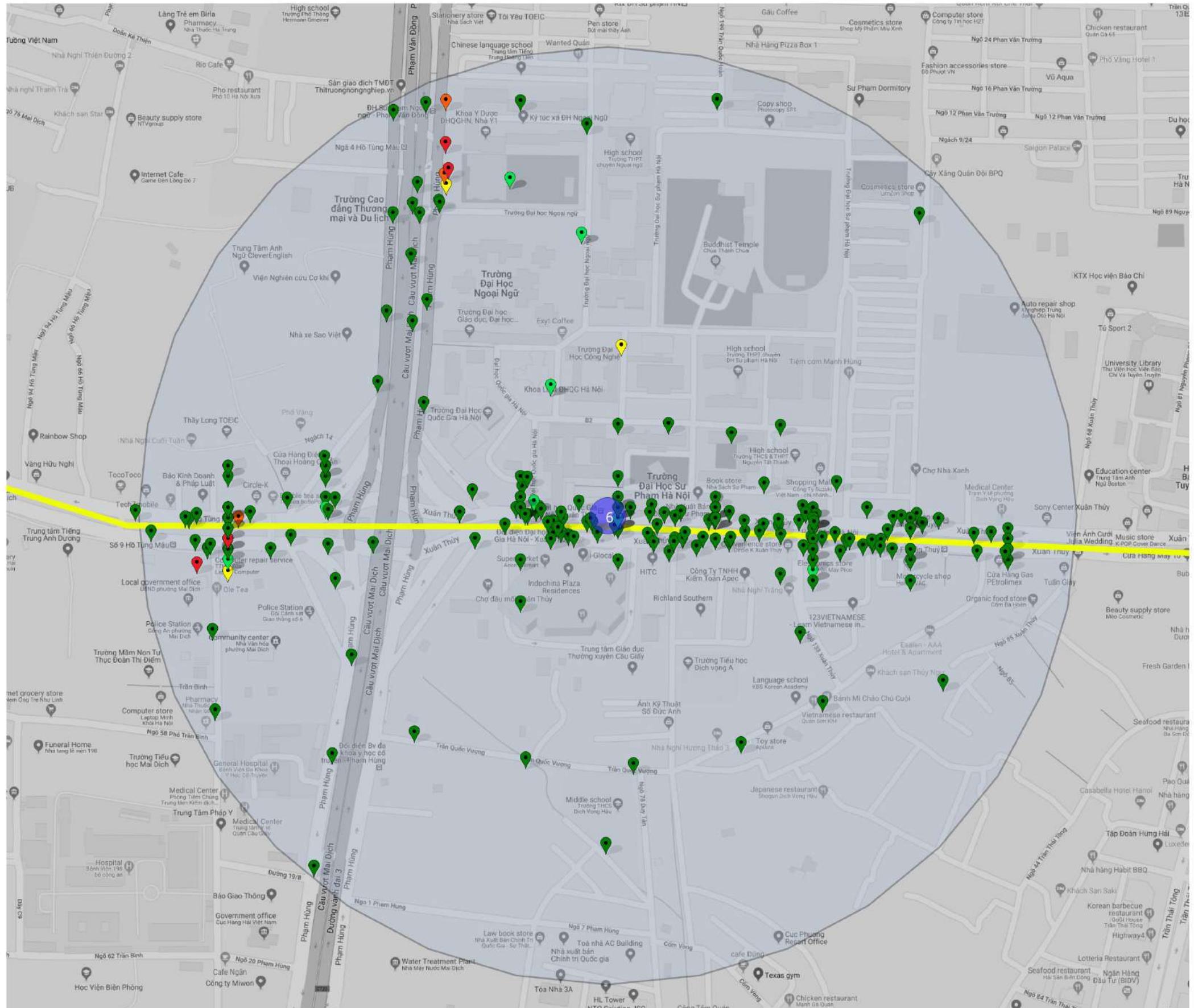
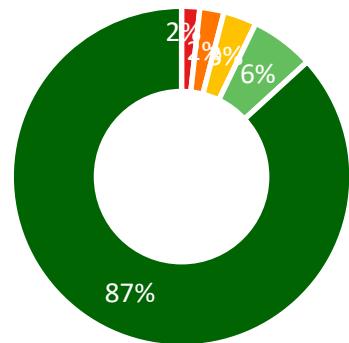
-  Poor
-  Below Average
-  Average
-  Good
-  Excellent

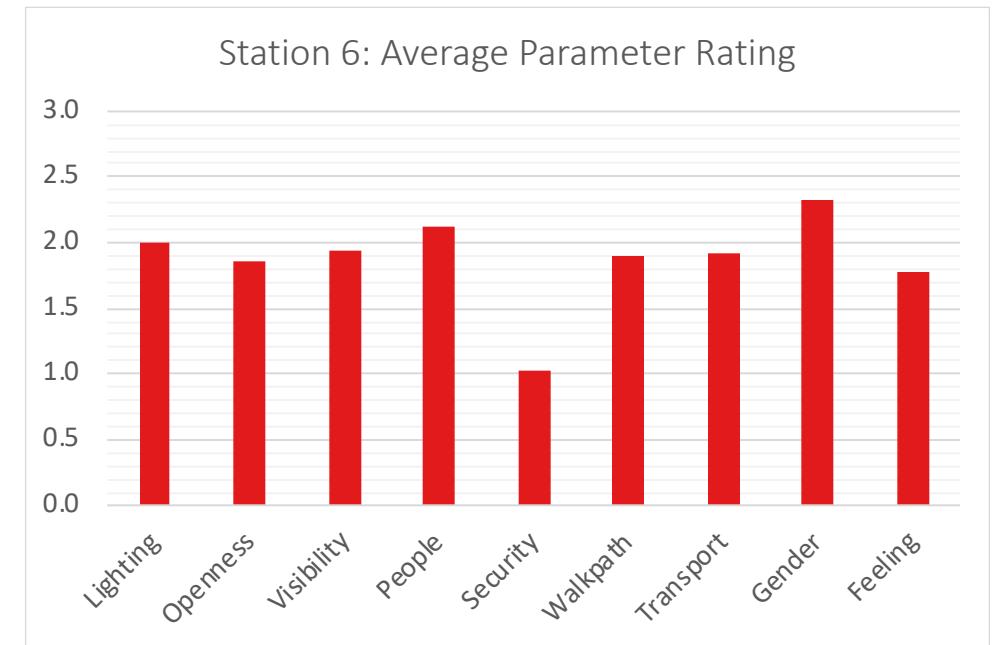
Metro Line

-  Overhead
-  500 Meter Radius

Base: Google Map

Safety Score 4.2/5





National University Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Gender Usage parameter has been rated the highest, followed by other parameters such as People and Lighting. Transport, Walkpath, Visibility and Openness parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 6, National University

**Hanoi Metro Line 3
National University
Station 6
Lighting**

Legend

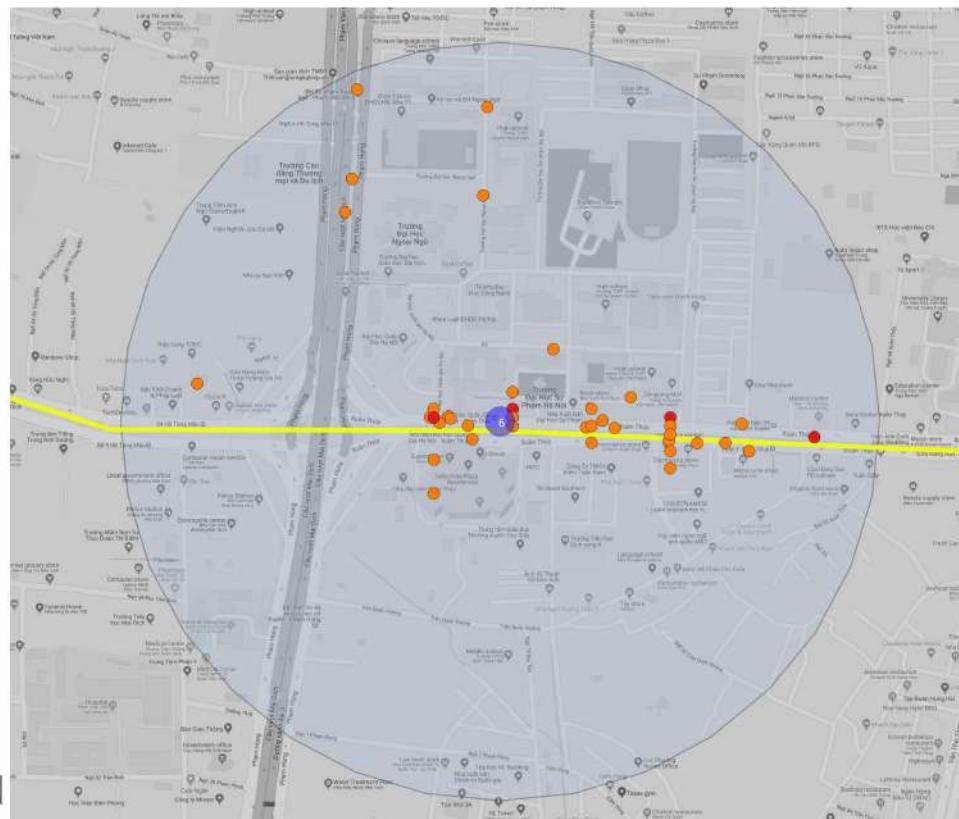
- Metro Station
- Subparameter
- Off Street Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
National University
Station 6
Correlation
(Gender+Lighting)**

Legend

- Metro Station
- Lighting
- Poor Light
- Some Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO LIGHTING WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor street lighting is available.

Recommendation: Well light streets are of primary concern when it comes to women’s safety in public places. Even when other public infrastructures are functional but street lighting is poor or missing, women’s participation and usage of that public place will decline over time. So it is of utmost importance to provide street lighting at these identified spots around the metro station where women are present.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

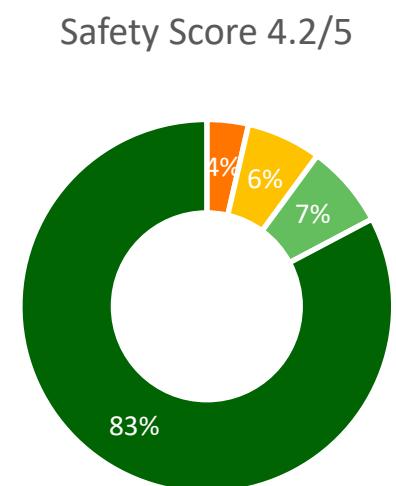
An excel sheet of Station No. 06 showing all the information stored in each geo-tagged point with supporting images:

ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
552199	21.03678	105.778	8/22/2018 19:12	45952	2	2	2	3	2	3	2	3	3	4.7	015349399331.jpg		
552200	21.03658	105.7782	8/22/2018 19:12	45953	1	1	2	2	1	2	3	1	1	4.1	015349399661.jpg	115349399661.jpg	215349399661.jpg
552201	21.03671	105.7791	8/22/2018 19:13	45952	2	1	1	1	0	1	1	0	1	1.6	015349400201.jpg		
552202	21.0366	105.779	8/22/2018 19:13	45929	3	2	2	2	1	2	1	1	2	4.3	115349400311.png		
552204	21.0372	105.779	8/22/2018 19:14	45910	1	1	1	1	0	1	1	1	1	1.6	115349400731.png		
552207	21.0371	105.779	8/22/2018 19:14	45922	2	1	1	2	2	2	2	3	2	4.3	115349400911.png		
552208	21.0365	105.779	8/22/2018 19:15	45929	1	1	1	0	0	0	0	0	1	0.7	115349401091.png		
552209	21.03676	105.7792	8/22/2018 19:15	45952	2	2	2	3	1	3	2	3	3	4.6	015349401501.jpg		
552212	21.0369	105.78	8/22/2018 19:17	45922	3	2	3	2	2	3	2	3	2	4.6	115349402281.png		
552215	21.0368	105.779	8/22/2018 19:17	45929	2	3	3	1	0	3	0	1	3	4.3	115349402591.png		
552216	21.0372	105.779	8/22/2018 19:18	45910	1	1	1	2	1	2	2	3	2	4.2	115349403071.png	215349403071.png	
552217	21.03641	105.7788	8/22/2018 19:20	45952	3	3	3	3	2	3	2	3	3	4.9	015349404181.jpg		
552218	21.0363	105.779	8/22/2018 19:20	45929	2	1	2	2	0	1	0	1	2	3.5	115349404261.png		
552220	21.0365	105.779	8/22/2018 19:21	45922	3	3	3	2	1	3	1	3	2	4.6	115349404651.png		
552221	21.0367	105.779	8/22/2018 19:21	45910	2	1	2	2	1	0	2	2	2	4.1	115349404661.png	215349404661.png	
552222	21.0364	105.779	8/22/2018 19:21	45929	2	2	1	1	0	1	1	2	2	4	115349405131.png		
552224	21.0364	105.779	8/22/2018 19:23	45929	2	2	2	2	1	2	0	2	3	4.3	115349405811.png		
552226	21.0365	105.778	8/22/2018 19:24	45929	1	2	2	2	0	2	3	2	2	4.3	115349406521.png		
552227	21.0364	105.778	8/22/2018 19:24	45910	1	1	1	1	0	2	1	3	1	3	115349406641.png		
552233	21.0365	105.778	8/22/2018 19:26	45929	2	2	3	2	1	2	2	2	3	4.5	115349407881.png		
552235	21.0365	105.778	8/22/2018 19:26	45910	2	2	2	2	1	2	1	1	2	4.2	115349407981.png		
552238	21.0365	105.779	8/22/2018 19:23	45910	2	2	2	2	1	2	2	3	3	4.5	115349409221.png	215349409221.png	
552246	21.041	105.777	8/22/2018 20:21	45915	2	2	2	2	1	2	0	3	2	4.3	115349415751.png	215349415751.png	315349415751.png
551482	21.0407	105.782	8/17/2018 16:19	45556	3	3	3	2	2	2	2	1	2	4.5			
571997	21.03671	105.7786	8/20/2018 17:14	17333	3	2	3	1	1	2	3	3	2	4.5	171428-10851.jpg	171433-10851.jpg	
572000	21.03678	105.78	8/20/2018 17:14	17333	3	2	3	1	1	2	2	3	2	4.4	171405-10851.jpg	171359-10851.jpg	
572003	21.03674	105.782	8/20/2018 17:11	17333	3	2	0	1	0	2	3	3	2	4.3	171150-10851.jpg	171136-10851.jpg	
572006	21.03675	105.7835	8/20/2018 17:10	17333	2	2	2	1	0	2	2	3	2	4.3	171011-10851.jpg	170922-10851.jpg	
572009	21.03667	105.785	8/20/2018 17:07	17333	3	2	2	2	0	3	2	2	2	4.4	170727-10851.jpg	170733-10851.jpg	
572012	21.03656	105.7867	8/20/2018 17:05	17333	3	2	2	1	0	2	3	3	2	4.4	170503-10851.jpg	170457-10851.jpg	
553015	21.03645	105.78	09/12/18 18:52	46277	2	2	3	3	2	1	3	3	3	4.7			
553016	21.03923	105.7809	09/12/18 20:07	46283	1	2	3	2	2	1	1	3	2	4.3	015367576651.jpg	115367576651.jpg	215367576651.jpg
553017	21.03975	105.7812	09/12/18 20:20	46283	3	2	3	2	2	2	1	3	2	4.5	015367584171.jpg	115367584171.jpg	215367584171.jpg
553018	21.03973	105.7812	09/12/18 20:22	46283	3	2	2	1	2	0	1	3	1	4.1	015367585561.jpg	115367585561.jpg	215367585561.jpg
553019	21.03991	105.7812	09/12/18 20:23	46283	2	2	2	0	2	0	1	0	1	2.6	015367586401.jpg	115367586401.jpg	215367586401.jpg
551599	21.03515	105.7863	8/17/2018 21:35	45646	1	1	2	2	2	1	1	1	3	4.2	015345165661.jpg		
553021	21.04	105.7812	09/12/18 20:25	46283	1	2	2	0	2	0	1	0	0	1.3	015367587271.jpg	115367587271.jpg	215367587271.jpg
553022	21.04005	105.7813	09/12/18 20:27	46283	0	3	2	0	0	1	1	0	0	0.9	015367588301.jpg	115367588301.jpg	215367588301.jpg
553023	21.0403	105.7812	09/12/18 20:28	46283	1	2	2	0	0	1	1	0	0	0.9	015367589191.jpg	115367589191.jpg	215367589191.jpg
553024	21.04071	105.7812	09/12/18 20:29	46283	1	2	2	0	0	1	1	0	1	1.6	015367590121.jpg	115367590121.jpg	215367590121.jpg
553026	21.04088	105.7809	09/12/18 20:33	46283	3	1	2	1	1	3	1	0	3	4.3	015367592381.jpg	115367592381.jpg	215367592381.jpg
553027	21.04113	105.7812	09/12/18 20:34	46283	2	1	1	0	1	3	1	0	2	3.5	015367593171.jpg	115367593171.jpg	215367593171.jpg
553040	21.03701	105.782	9/13/2018 9:47	46277	3	3	3	3	2	2	3	3	2	4.8	015368068721.jpg		
553041	21.0366	105.7823	9/13/2018 9:48	46284	2	3	3	3	0	3	2	3	2	4.6	015368069211.jpg		

Seventh Station of Hanoi Metro Line 3

Chua Ha Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, walkpaths and transport was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

CHUA HA

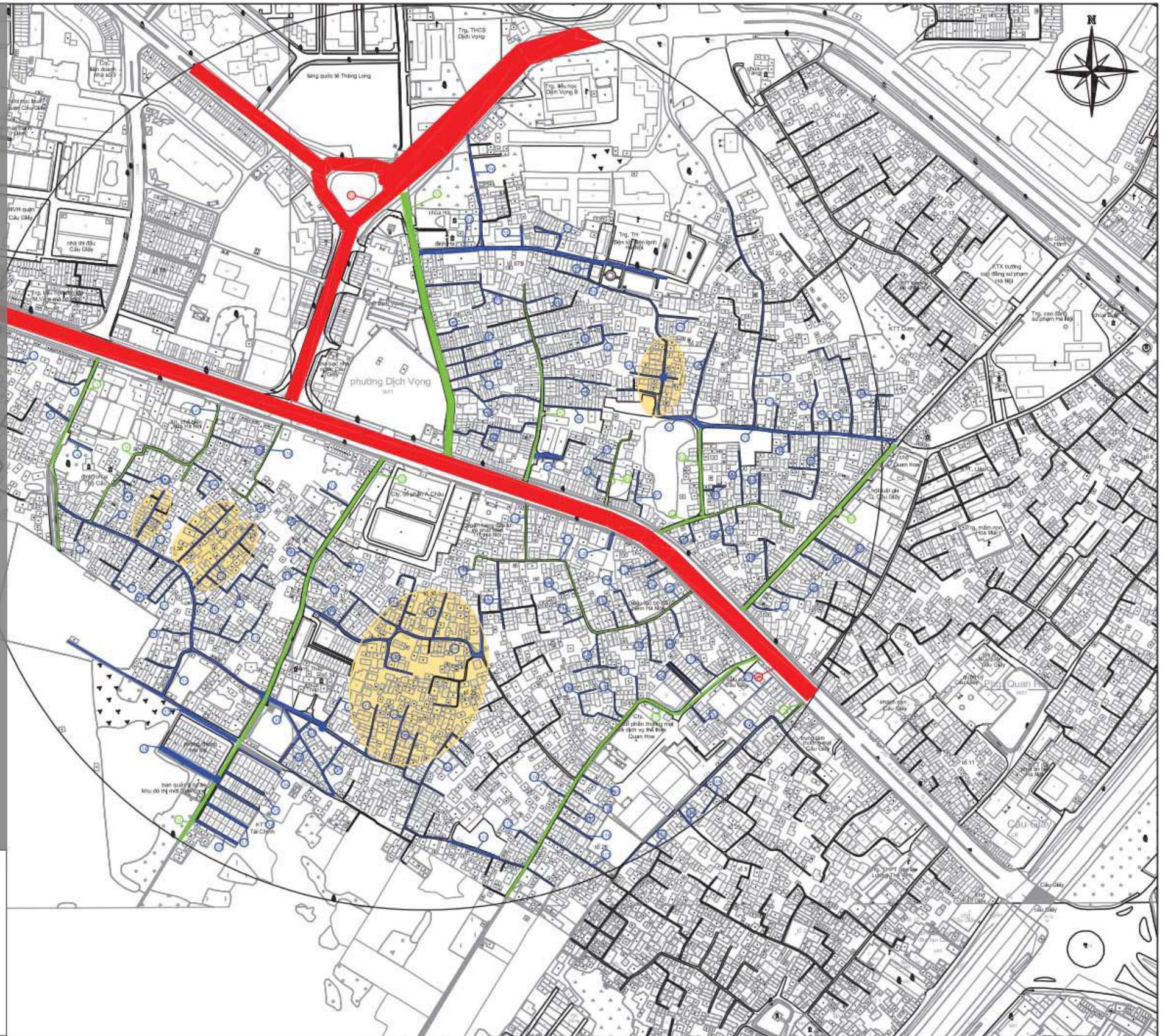


SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





139 Audit Pins within 500m radius of Chua Ha Station

A total of 139 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 7 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.2 on a scale of 5 is given for Station Chua Ha (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 83% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to below average, where 7% is good and the remaining 10% is divided between average and below average. There is no score for poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	5
Average	2.1 - 3.0	9
Good	3.1 - 4.0	10
Excellent	4.1 - 5.0	115

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Chua Ha Station 7 Safety Score

Legend

 Metro Station

Safety Audits

 Average

 Good

 Excellent

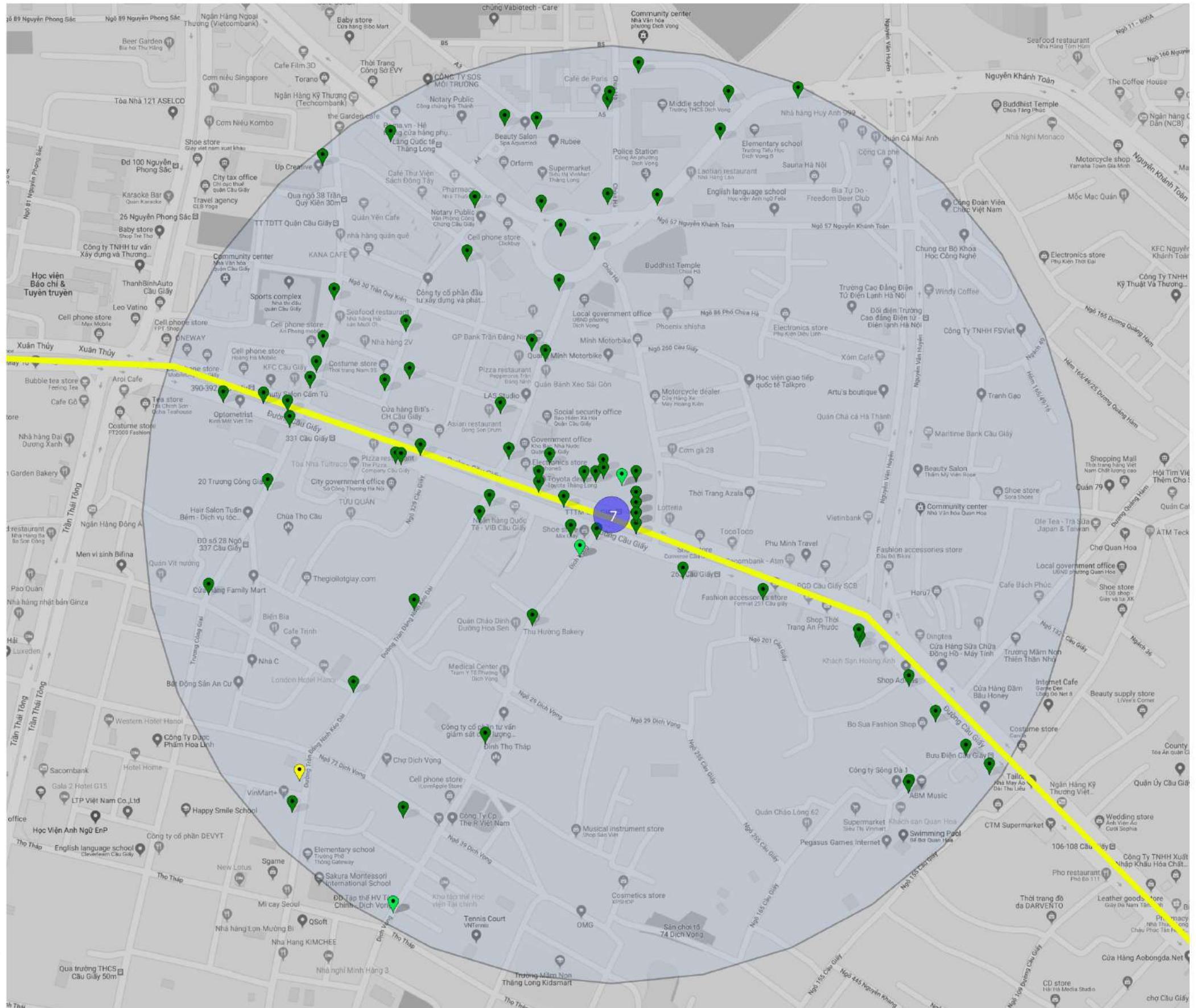
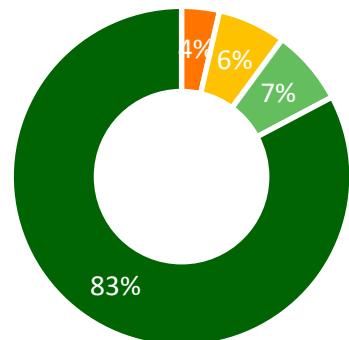
Metro Line

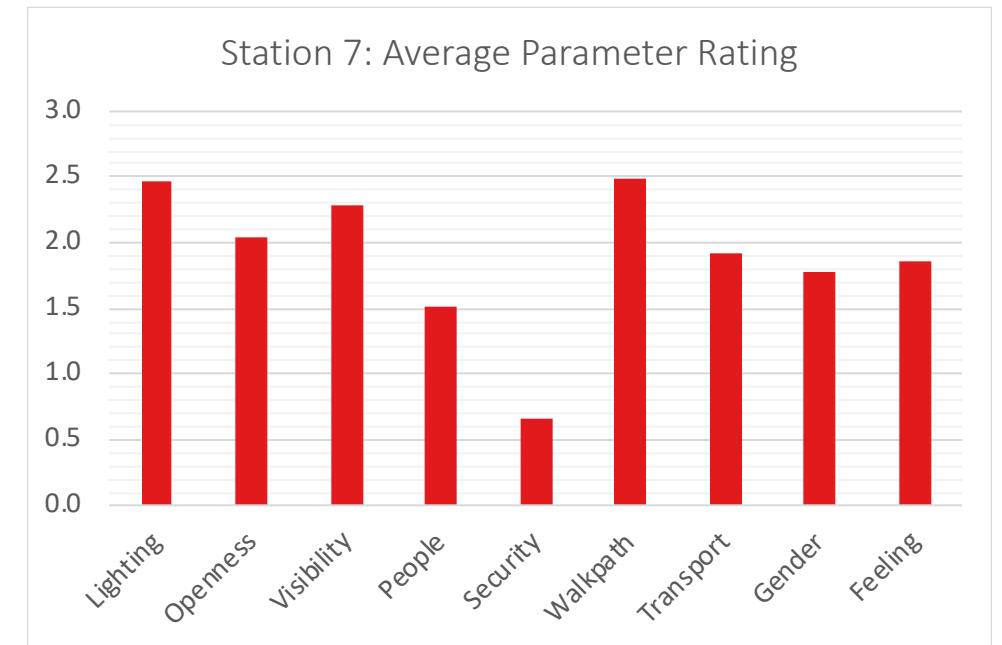
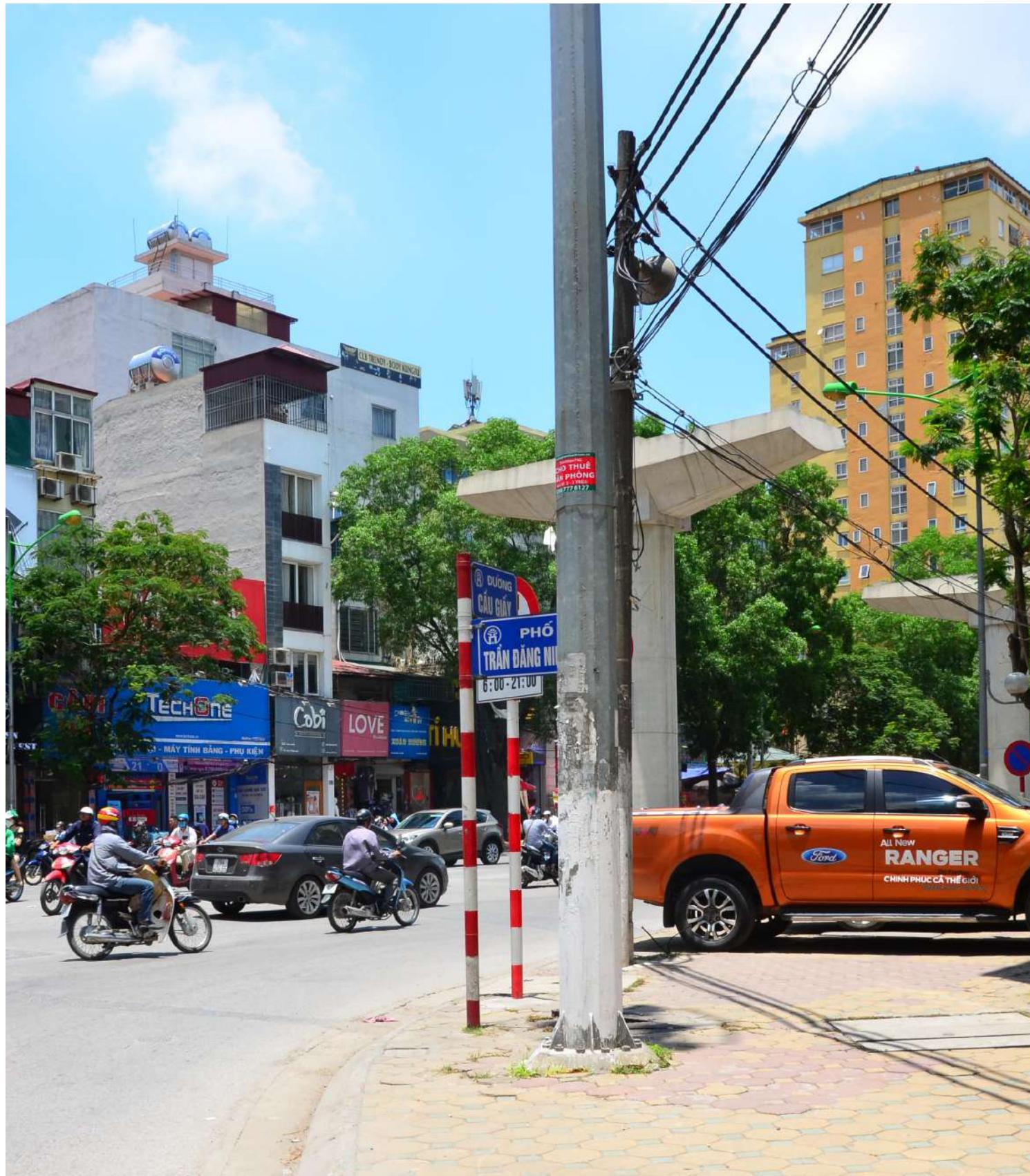
 Overhead

 500 Meter Radius

Base: Google Map

Safety Score 4.2/5





Chua Ha Station:

Average Parameter Rating Graph

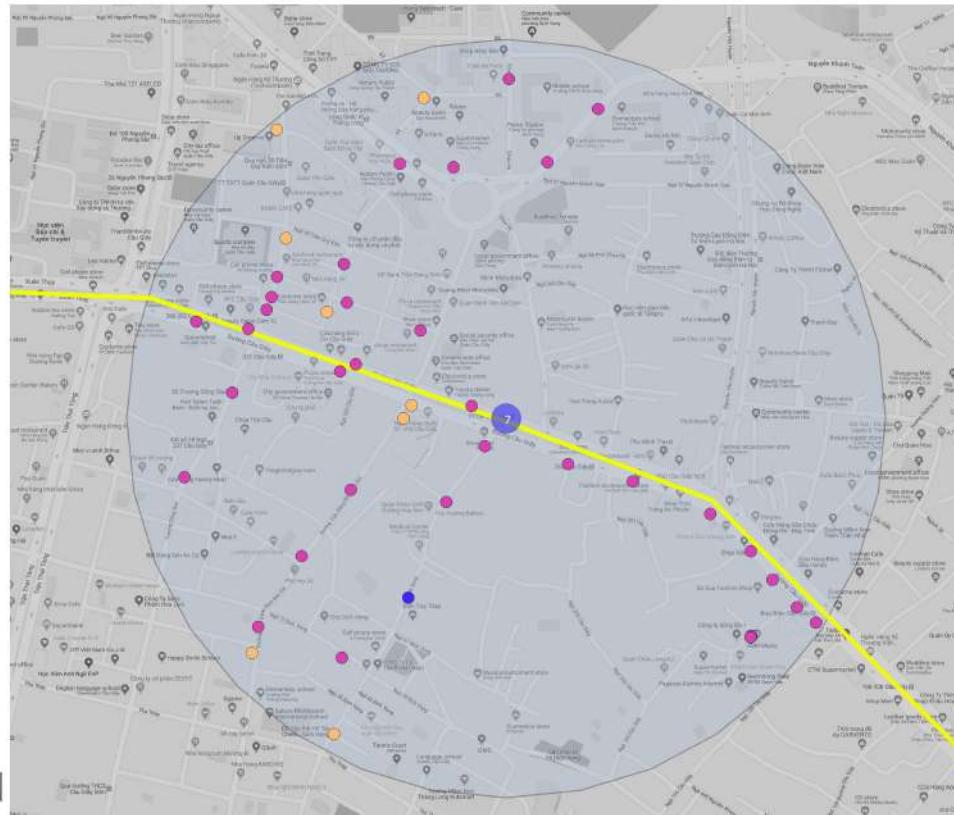
The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath and Lighting parameters have been rated the highest, followed by other parameters such as Visibility and Openness. Transport, Gender Usage and People parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 7, Chua Ha

**Hanoi Metro Line 3
Chua Ha
Station 7
Walkpath**

Legend

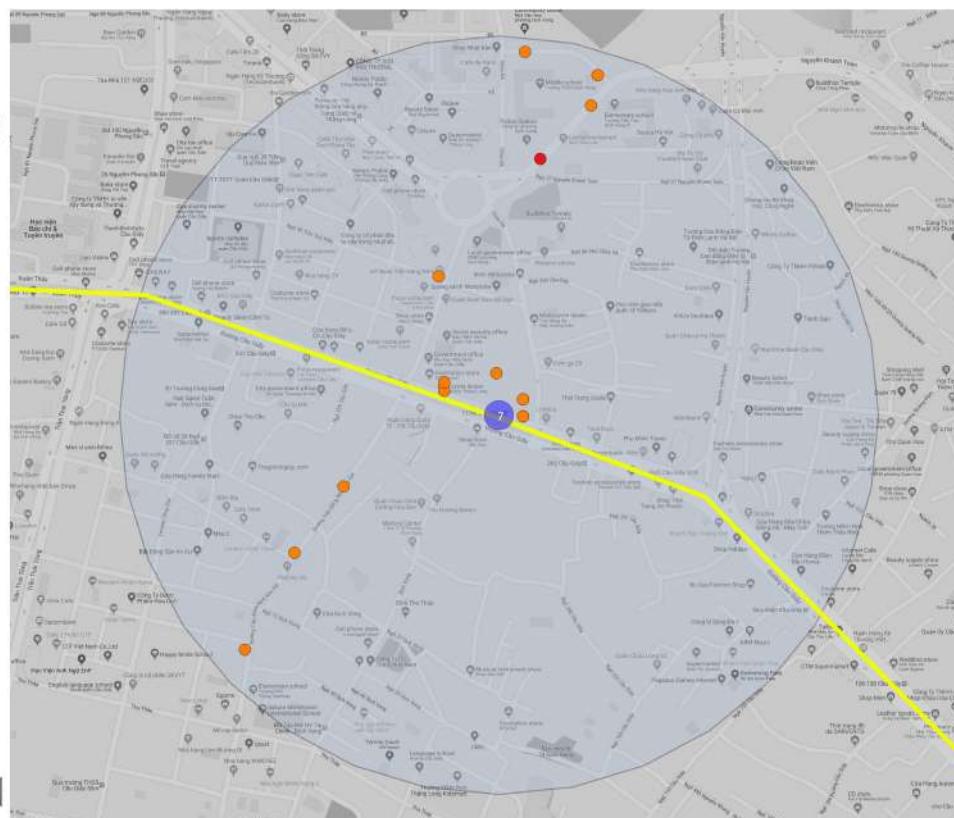
- Metro Station
- Subparameter
- No Pavement
- Car Blocking
- Other Blocking
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Chua Ha
Station 7
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Unavailable
- Distant
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women’s accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 07 showing all the information stored in each geo-tagged point with supporting images:

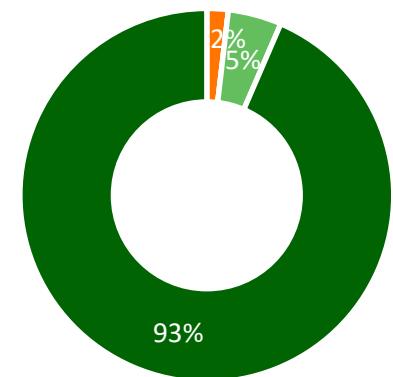
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
570911	21.03642	105.7877	8/20/2018 19:02	17333	3	2	3	1	0	3	2	3	2	4.4	190251-10855.jpg	190256-10855.jpg	
570912	21.03638	105.7887	8/20/2018 19:03	17333	3	2	3	1	0	3	1	3	2	4.4	190313-10855.jpg	190306-10855.jpg	
570913	21.03624	105.7896	8/20/2018 19:03	17333	3	3	3	1	0	3	2	3	2	4.5	190350-10855.jpg	190356-10855.jpg	
570914	21.03606	105.7908	8/20/2018 19:04	17333	3	2	3	1	0	3	3	3	2	4.5	190416-10855.jpg	190425-10855.jpg	
570915	21.03583	105.7914	8/20/2018 19:04	17333	2	2	2	1	0	3	3	3	2	4.4	190459-10855.jpg		
570916	21.03547	105.7926	8/20/2018 19:05	17333	2	2	3	1	1	3	2	3	2	4.4	190505-10855.jpg	190513-10855.jpg	
570917	21.03507	105.7935	8/20/2018 19:05	17333	3	2	2	1	1	3	2	3	2	4.4	190527-10855.jpg	190536-10855.jpg	
570918	21.03475	105.7946	8/20/2018 19:05	17333	3	2	1	1	0	3	2	3	2	4.3	190557-10855.jpg	190604-10855.jpg	
570919	21.03437	105.7955	8/20/2018 19:06	17333	3	2	3	2	0	3	3	2	2	4.5	190628-10855.jpg		
570920	21.03417	105.7963	8/20/2018 19:06	17333	3	2	3	1	1	3	3	3	2	4.6	190639-10855.jpg	190634-10855.jpg	
570921	21.03372	105.7973	8/20/2018 19:06	17333	3	2	3	1	1	3	2	3	2	4.5	190651-10855.jpg	190656-10855.jpg	
570922	21.033	105.7981	8/20/2018 19:07	17333	3	2	3	1	0	3	2	3	2	4.4	190704-10855.jpg	190708-10855.jpg	
570923	21.0325	105.7986	8/20/2018 19:07	17333	3	2	3	1	0	3	3	3	2	4.5	190719-10855.jpg	190713-10855.jpg	
571493	21.03894	105.7959	8/23/2018 18:57	17333	3	2	1	2	1	2	1	2	2	4.3	185750-10891.jpg	185738-10891.jpg	
571496	21.03922	105.795	8/23/2018 18:57	17333	2	2	0	2	1	3	1	3	2	4.3	185718-10891.jpg	185724-10891.jpg	
571499	21.03887	105.7947	8/23/2018 18:57	17333	3	2	1	0	2	3	2	0	2	4.2	185712-10891.jpg	185706-10891.jpg	
571502	21.03868	105.794	8/23/2018 18:56	17333	2	2	2	2	1	2	2	1	2	4.3	185635-10891.jpg	185629-10891.jpg	
571505	21.03927	105.7929	8/23/2018 18:55	17333	2	2	1	1	0	3	2	0	1	3.5	185541-10891.jpg	185549-10891.jpg	
571508	21.03975	105.7923	8/23/2018 18:55	17333	2	2	1	0	0	3	2	0	1	3	185529-10891.jpg		
571511	21.04009	105.7919	8/23/2018 18:55	17333	3	2	3	2	1	3	1	1	2	4.4	185516-10891.jpg		
570940	21.03552	105.7937	8/21/2018 18:27	17333	2	2	3	2	1	3	2	0	2	4.3	182728-10860.jpg	182734-10860.jpg	
570945	21.03646	105.7941	8/21/2018 18:27	17333	1	2	3	1	1	3	1	0	1	4	182719-10860.jpg	182715-10860.jpg	
570951	21.03713	105.7942	8/21/2018 18:27	17333	1	2	3	2	1	3	1	0	2	4.2	182707-10860.jpg		
571950	21.03232	105.7978	8/23/2018 19:17	17333	3	2	3	2	0	2	2	2	2	4.4	191741-10891.jpg	191749-10891.jpg	
570958	21.03766	105.7942	8/21/2018 18:26	17333	1	3	3	3	2	3	2	3	3	4.8	182651-10860.jpg	182647-10860.jpg	
571951	21.03268	105.7984	8/23/2018 19:17	17333	3	2	2	1	0	2	3	3	2	4.4	191721-10891.jpg		
571952	21.03334	105.7978	8/20/2018 19:07	17333	3	2	3	2	1	3	2	1	2	4.4	190700-10855.jpg	191646-10891.jpg	
571953	21.03378	105.7973	8/23/2018 19:16	17333	3	2	3	2	1	3	2	3	2	4.6	191628-10891.jpg		
571954	21.0362	105.7917	09/10/18 20:32	17333	3	2	3	1	0	3	2	0	2	4.3	203246-11010.jpg	190115-10891.jpg	
570964	21.03795	105.7952	8/21/2018 18:26	17333	1	3	2	2	3	3	0	2	2	4.4	182630-10860.jpg	182634-10860.jpg	
571957	21.03618	105.7924	09/10/18 20:30	17333	2	2	1	2	0	3	2	3	2	4.3	203046-11010.jpg		
571959	21.03659	105.7918	09/10/18 20:29	17333	3	2	3	0	0	3	2	0	2	4.2	202917-11010.jpg		
571961	21.03674	105.7926	09/10/18 20:31	17333	2	2	2	2	0	3	2	3	2	4.4	203108-11010.jpg	202451-11010.jpg	
571963	21.03705	105.7919	09/10/18 20:32	17333	2	2	3	1	0	3	2	0	2	4.2	203224-11010.jpg		
570970	21.03858	105.7959	8/21/2018 18:26	17333	1	2	1	2	2	3	1	2	2	4.3	182610-10860.jpg	182616-10860.jpg	
571965	21.03833	105.7918	09/10/18 20:23	17333	2	2	2	1	0	3	3	0	2	4.2	202316-11010.jpg		
571967	21.03881	105.791	09/10/18 20:12	17333	2	2	1	1	0	3	2	0	1	3.5	201250-11010.jpg		
571968	21.0398	105.7905	09/10/18 20:20	17333	3	2	2	0	1	3	2	0	2	4.2	202001-11010.jpg		
571970	21.03935	105.7916	09/10/18 20:22	17333	2	2	3	2	0	3	2	2	2	4.4	202241-11010.jpg		
571973	21.03856	105.7925	09/10/18 19:45	17333	2	2	3	2	1	3	3	2	2	4.5	194501-11010.jpg		
571975	21.03793	105.7933	5/23/2018 11:35	17333	2	2	3	2	0	3	2	2	2	4.4	113518-10552.jpg	194447-11010.jpg	
571976	21.03753	105.7946	09/10/18 20:07	17333	3	2	3	0	2	3	2	0	2	4.3	200752-11010.jpg		
571977	21.03656	105.7939	09/10/18 20:10	17333	3	2	1	1	1	3	1	3	2	4.3	201037-11010.jpg		
571978	21.03741	105.7933	09/10/18 20:11	17333	2	2	2	2	0	3	2	3	2	4.4	201122-11010.jpg	201135-11010.jpg	

Eighth Station of Hanoi Metro Line 3

Cau Giay Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting and walkpath was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

CAU GIAY

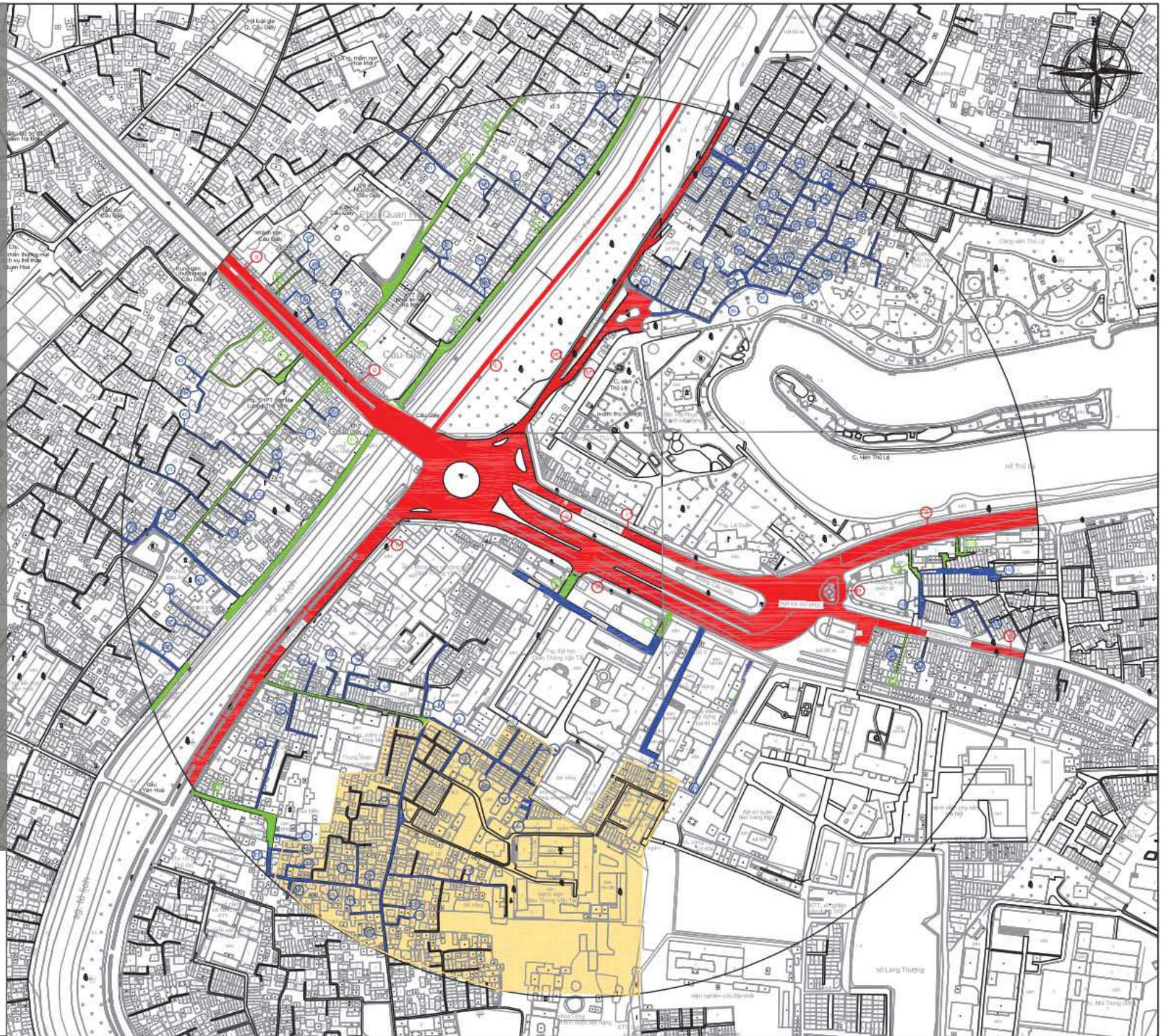
Safety Score 4.4/5



SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014





108 Audit Pins within 500m radius of Cau Giay Station

A total of 108 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 8 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.4 on a scale of 5 is given for Station Cau Giay (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 93% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to below average, where 5% is good and only the remaining 2% is below average. There are no scores for average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	2
Average	2.1 - 3.0	0
Good	3.1 - 4.0	5
Excellent	4.1 - 5.0	101

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Cau Giay Station 8 Safety Score

Legend

 Metro Station

Safety Audits

 Average

 Good

 Excellent

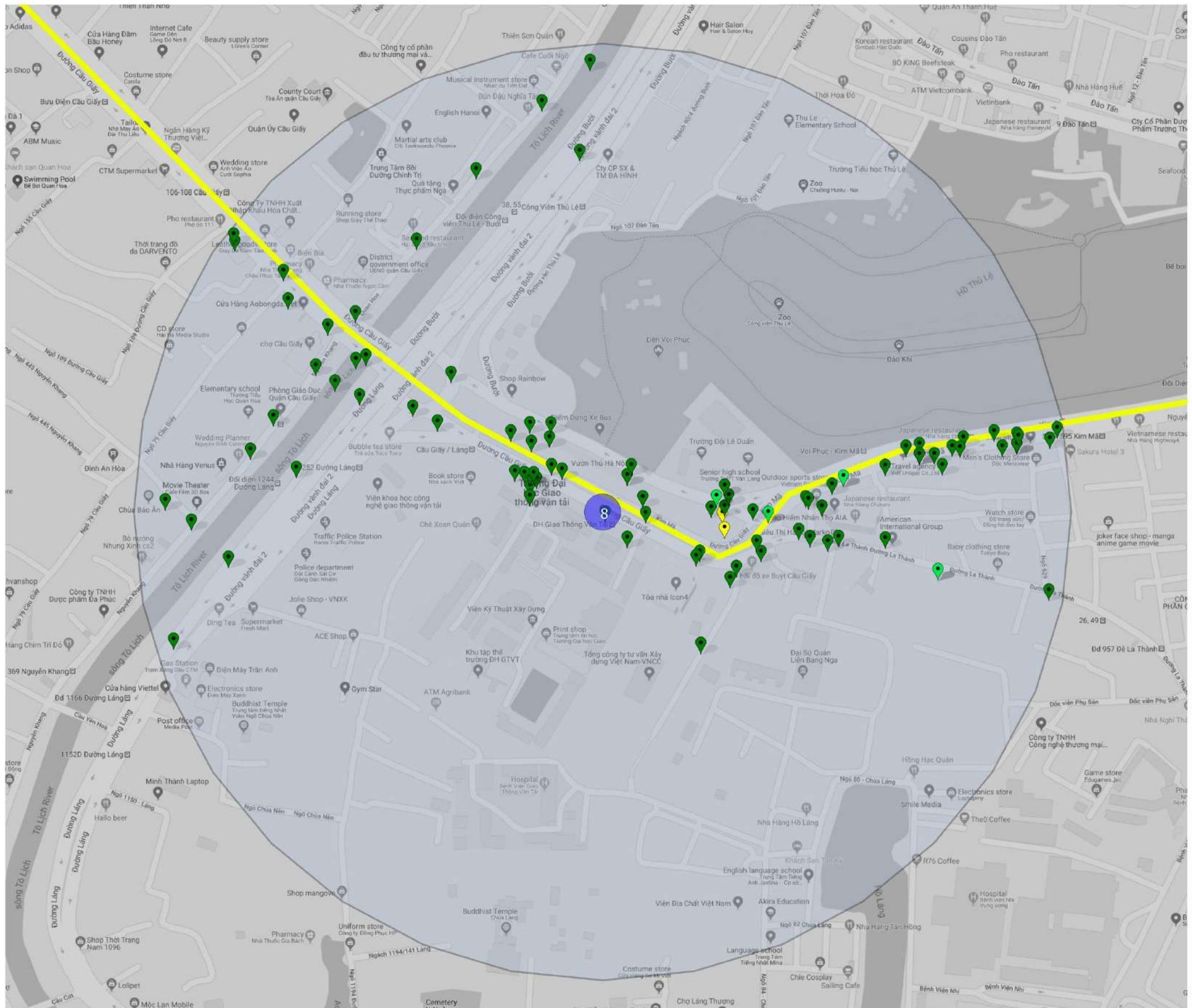
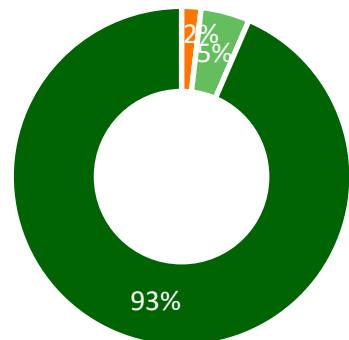
Metro Line

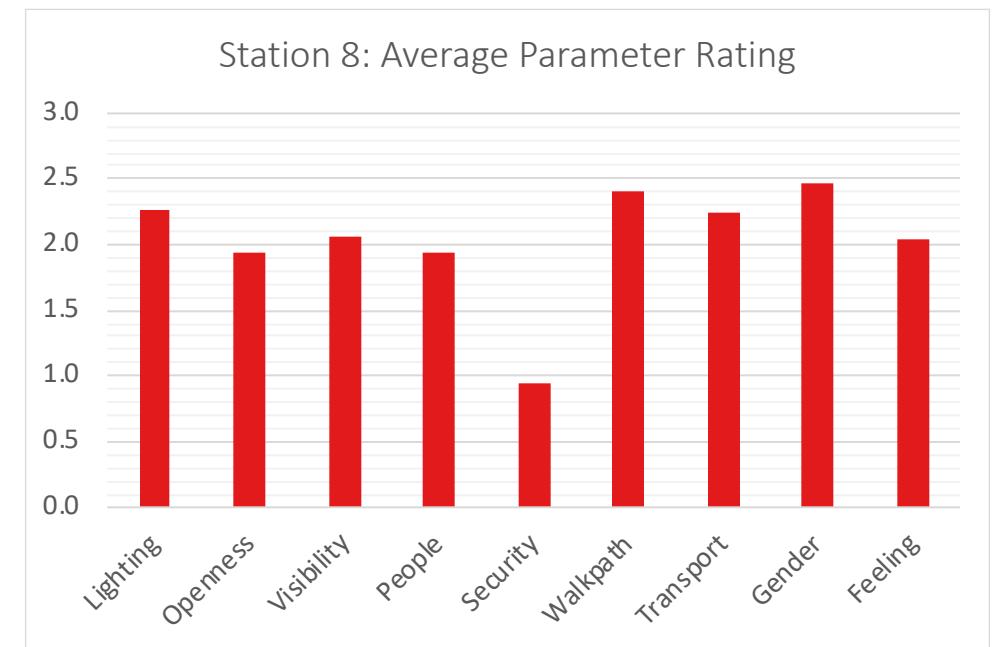
 Overhead

 500 Meter Radius

Base: Google Map

Safety Score 4.4/5





Cau Giay Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Gender Usage and Walkpath parameters have been rated the highest, followed by other parameters such as Transport, Lighting and Visibility. Openness and People parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 8, Cau Giay

**Hanoi Metro Line 3
Cau Giay
Station 8
Walkpath**

Legend

- Metro Station
- Subparameter
- Car Blocking
- Other Blocking
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Cau Giay
Station 8
Correlation
(Gender+Lighting)**

Legend

- Metro Station
- Lighting
- Poor Light
- Some Light
- Metro Line
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO LIGHTING WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but poor street lighting is available.

Recommendation: Well light streets are of primary concern when it comes to women’s safety in public places. Even when other public infrastructures are functional but street lighting is poor or missing, women’s participation and usage of that public place will decline over time. So it is of utmost importance to provide street lighting at these identified spots around the metro station where women are present.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 08 showing all the information stored in each geo-tagged point with supporting images:

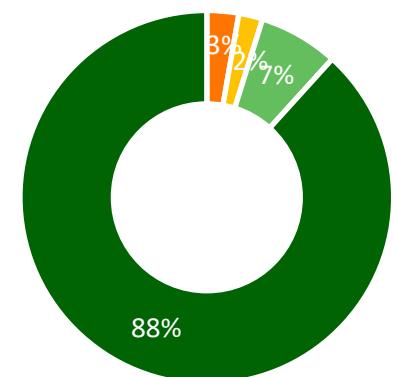
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
552902	21.02841	105.8062	09/10/18 21:06	46231	2	2	3	2	1	3	2	2	2	4.4	p015365883671.jpg		
570928	21.02952	105.8021	8/20/2018 19:08	17333	3	2	3	1	0	3	3	3	2	4.5	190843-10855.jpg	190851-10855.jpg	
552903	21.0284	105.8067	09/10/18 21:07	46231	2	2	2	3	0	3	2	2	2	4.4	p015365884561.jpg		
570929	21.02904	105.8028	8/20/2018 19:09	17333	3	2	1	1	0	3	3	3	2	4.4	190903-10855.jpg	190858-10855.jpg	
552904	21.02848	105.8058	09/10/18 21:09	46231	2	2	2	1	1	3	2	1	2	4.3	p015365885631.jpg		
570930	21.02865	105.8038	8/20/2018 19:09	17333	3	2	1	1	0	3	3	3	2	4.4	190911-10855.jpg	190916-10855.jpg	
552905	21.02879	105.8058	09/10/18 21:10	46231	1	1	2	1	1	3	3	1	2	4.2	p015365886291.jpg		
570931	21.02823	105.8047	8/20/2018 19:09	17333	3	2	0	1	1	3	2	3	2	4.3	190925-10855.jpg	190930-10855.jpg	
552906	21.02891	105.8061	09/10/18 21:11	46231	3	3	3	3	2	3	2	2	3	4.8	p015365887151.jpg		
552907	21.02928	105.8069	09/10/18 21:13	46231	2	2	2	2	1	2	1	1	2	4.2	p015365888311.jpg		
552909	21.02936	105.8075	09/10/18 21:14	46231	2	2	2	2	1	2	1	2	2	4.3	p015365888861.jpg		
552912	21.02938	105.808	09/10/18 21:15	46231	2	2	2	2	1	2	1	1	2	4.2	p015365889581.jpg		
551752	21.0291	105.8032	8/19/2018 18:33	45646	2	2	2	2	1	3	3	3	2	4.5	p015346784031.jpg		
551754	21.0292	105.807	8/19/2018 18:40	45556	3	1	3	3	2	2	3	3	2	4.6	115346788241.png	215346788241.png	
551755	21.02902	105.8029	8/19/2018 18:40	45646	3	2	2	3	1	2	2	3	2	4.5	p015346788301.jpg		
551403	21.02865	105.805	8/14/2018 18:59	45603	0	1	1	1	1	1	2	1	1	2	p015342479321.jpg		
551756	21.02942	105.8028	8/19/2018 18:40	45777	2	2	2	2	2	3	2	3	3	4.6	p015346788531.jpg		
570946	21.02837	105.8053	8/20/2018 19:09	17333	3	2	1	1	0	2	2	3	2	4.3	190941-10855.jpg	190935-10855.jpg	
571543	21.02789	105.8083	8/23/2018 19:32	17333	3	2	3	2	0	3	3	0	2	4.4	193229-10891.jpg	193221-10891.jpg	
551757	21.0292	105.807	8/19/2018 18:41	45001	3	3	3	3	2	2	3	3	3	4.9	115346788711.png		
551407	21.0287	105.805	8/14/2018 19:02	45612	1	1	1	2	2	2	2	3	2	4.3	115342481171.png	215342481171.png	
571545	21.02809	105.8072	8/23/2018 19:32	17333	2	2	3	0	0	2	2	0	1	3.5	193201-10891.jpg		
551759	21.0292	105.8072	8/19/2018 18:41	45632	2	2	1	3	0	1	2	3	2	4.3	p015346788831.jpg		
551409	21.02881	105.805	8/14/2018 19:04	45636	1	1	3	3	2	0	0	3	2	4.2	p015342482251.jpg	115342482251.jpg	
551761	21.0293	105.808	8/19/2018 18:41	45556	3	2	3	3	2	2	3	3	2	4.7	115346789121.png	215346789121.png	
551606	21.0289	105.803	8/18/2018 18:35	45556	2	3	2	3	3	2	2	3	3	4.8	115345921231.png	215345921231.png	
571547	21.02837	105.8061	8/23/2018 19:31	17333	2	2	3	2	0	3	3	2	2	4.4	193136-10891.jpg	193130-10891.jpg	
551762	21.0293	105.807	8/19/2018 18:42	45776	1	1	2	3	2	3	1	3	2	4.4	115346789201.png		
551607	21.03211	105.8035	8/18/2018 18:38	45797	2	2	2	3	1	2	3	3	2	4.5	p015345923131.jpg	115345923131.jpg	215345923131.jpg
570952	21.02899	105.8062	8/20/2018 19:10	17333	3	2	1	0	0	2	3	0	1	3.5	191000-10855.jpg	190955-10855.jpg	
551763	21.0292	105.807	8/19/2018 18:47	45645	2	2	3	3	1	2	2	3	2	4.5	115346789231.png		
551608	21.0288	105.803	8/18/2018 18:41	45556	3	3	2	3	3	2	3	3	2	4.8	115345925111.png	215345925111.png	
571549	21.02801	105.8051	8/23/2018 19:31	17333	3	2	1	1	0	3	2	3	2	4.3	193100-10891.jpg		
551764	21.02942	105.8078	8/19/2018 18:43	45777	1	2	2	2	1	2	2	2	3	4.4	p015346789861.jpg		
551609	21.0288	105.803	8/18/2018 18:42	45556	3	3	3	2	2	2	2	3	2	4.6	115345925641.png	215345925641.png	
551765	21.0291	105.8072	8/19/2018 18:40	45648	3	3	3	3	2	2	3	3	3	4.9	p015346789921.jpg		
551610	21.0284	105.804	8/18/2018 18:43	45556	3	3	3	3	2	3	3	2	2	4.8	115345926321.png		
551414	21.0289	105.805	8/14/2018 19:05	45643	1	1	3	3	1	1	2	3	1	4.2	115342483141.png		
571552	21.02738	105.8048	8/23/2018 19:30	17333	3	2	0	1	0	3	2	3	2	4.3	193039-10891.jpg	193044-10891.jpg	
551766	21.0293	105.808	8/19/2018 18:43	45776	1	1	3	3	2	3	1	3	2	4.4	115346790031.png		
551611	21.029	105.803	8/18/2018 18:58	45789	2	1	2	2	1	2	3	3	2	4.4	115345928811.png		
551767	21.0292	105.807	8/19/2018 18:41	45001	3	3	3	3	2	2	3	3	3	4.9	115346790201.png		
551612	21.03298	105.8036	8/18/2018 18:48	45797	2	2	2	2	2	2	2	2	2	4.4	p015345928931.jpg	115345928931.jpg	215345928931.jpg
570959	21.02928	105.8073	8/20/2018 19:10	17333	3	2	2	1	0	2	2	3	2	4.3	191011-10855.jpg	191019-10855.jpg	

Ninth Station of Hanoi Metro Line 3

Ngoc Khanh Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, street lighting and transport was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

NGOC KHANH

Safety Score 4.3/5

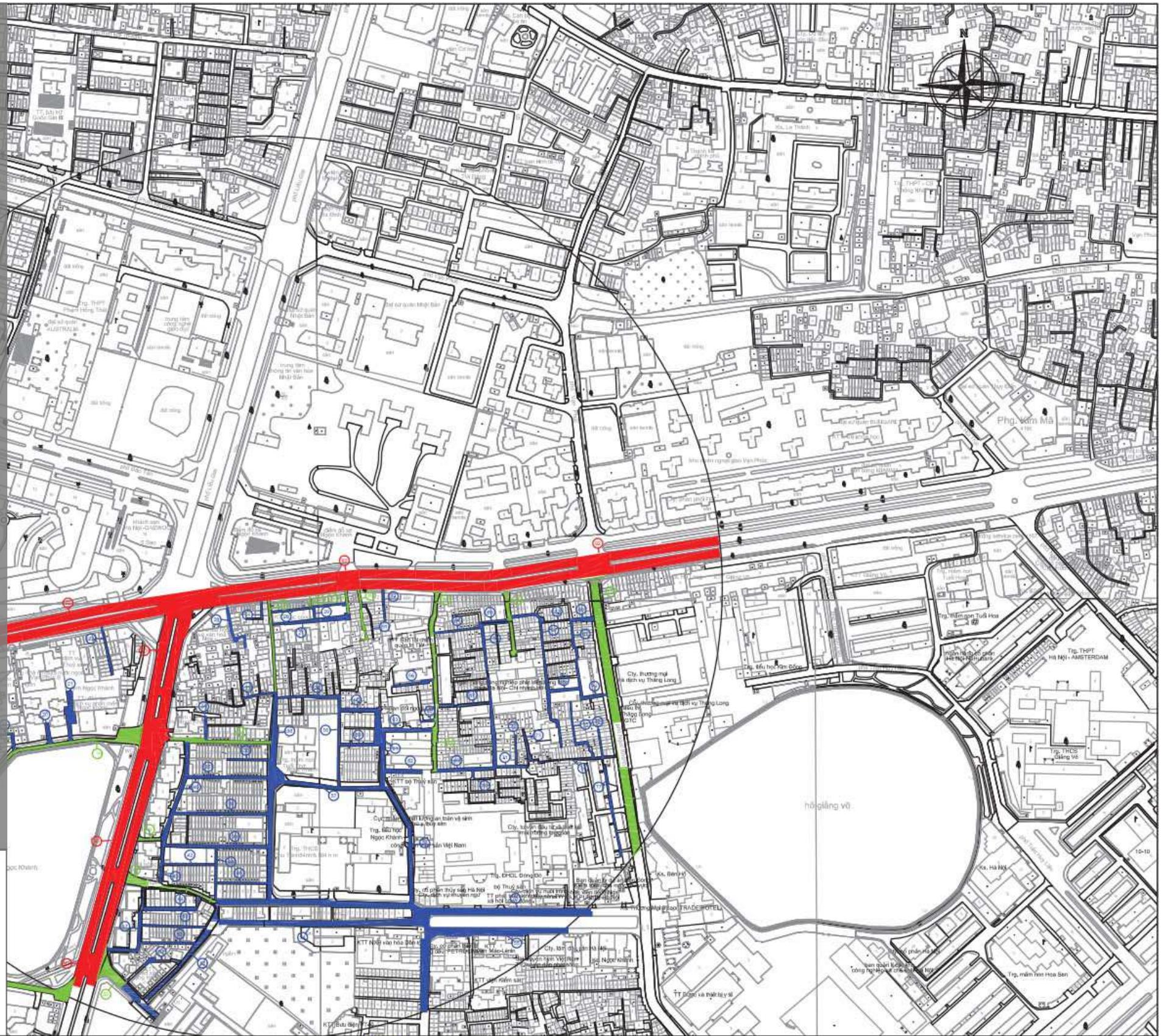


SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





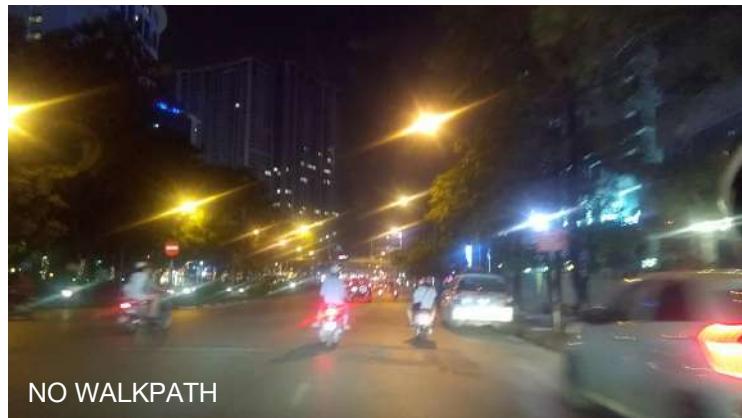
BAD CONDITION PHOTOS AROUND STATION 9

POOR LIGHT



GOOD CONDITION PHOTOS AROUND STATION 9

BRIGHT LIGHT



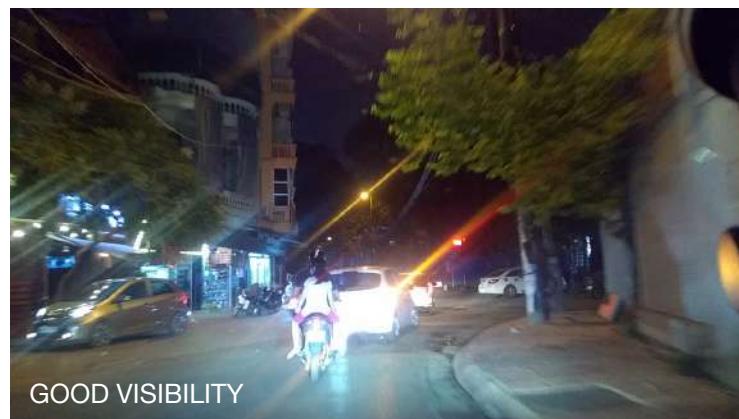
NO WALKPATH



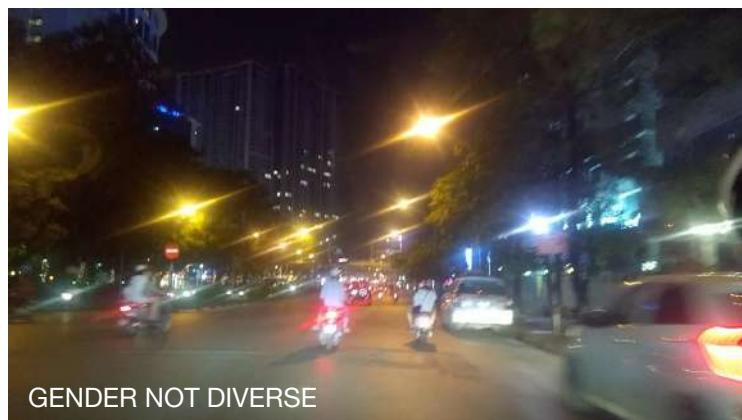
GOOD WALKPATH



NO VISIBILITY



GOOD VISIBILITY



GENDER NOT DIVERSE



GENDER FAIRLY DIVERSE

145 Audit Pins within 500m radius of Ngoc Khanh Station

A total of 145 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 9 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.3 on a scale of 5 is given for Station Ngoc Khanh (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 88% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to below average, where 7% is good and the remaining 5% is divided between average and below average. There is no score for poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	4
Average	2.1 - 3.0	3
Good	3.1 - 4.0	10
Excellent	4.1 - 5.0	128

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Ngoc Khanh Station 9 Safety Score

Legend

 Metro Station

Safety Audits

 Below Average

 Average

 Good

 Excellent

Metro Line

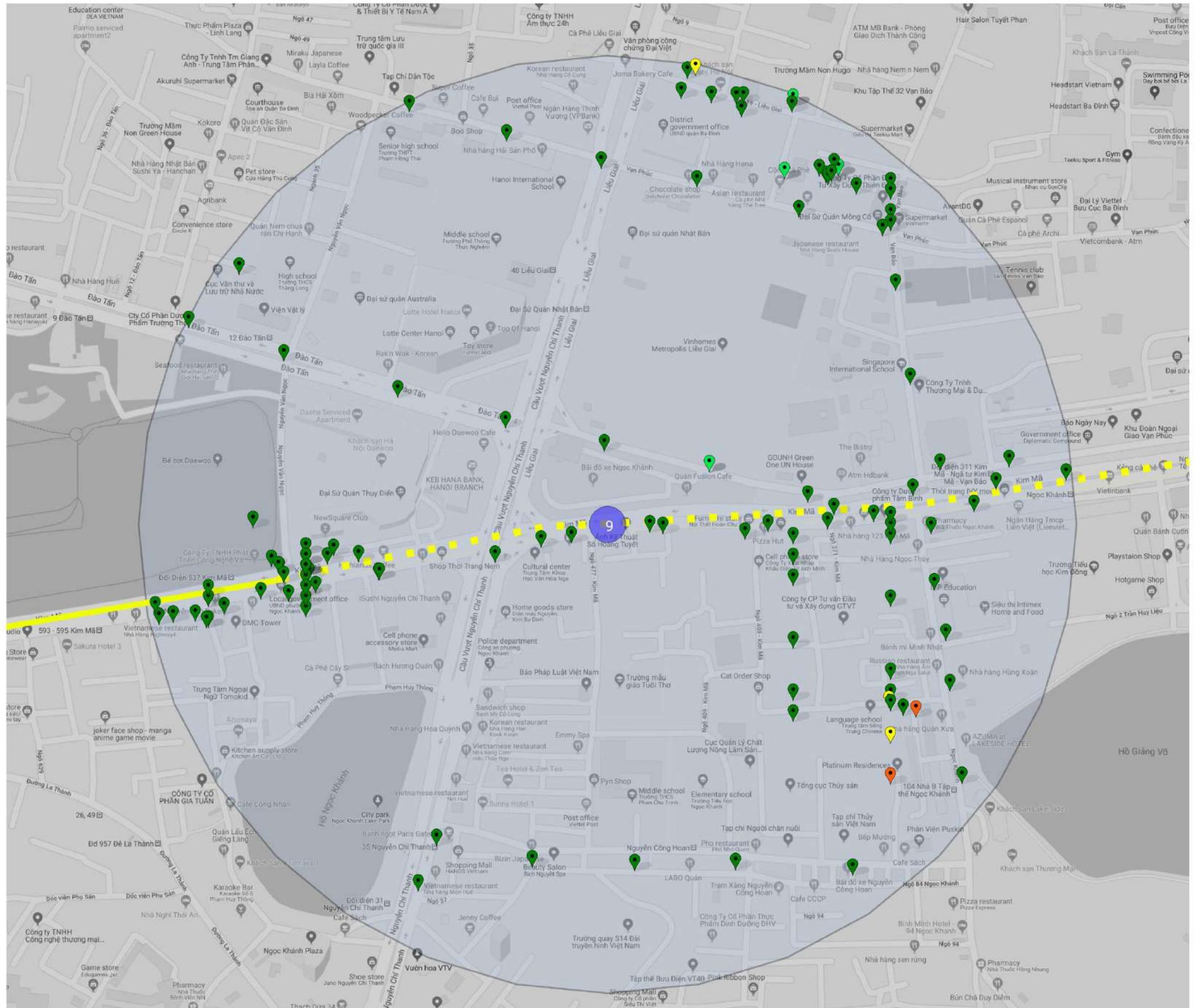
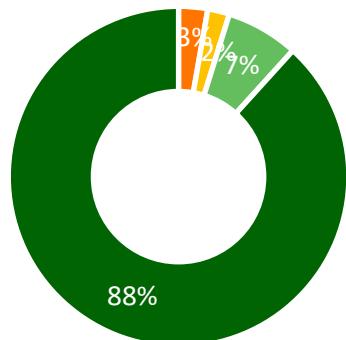
 Underground

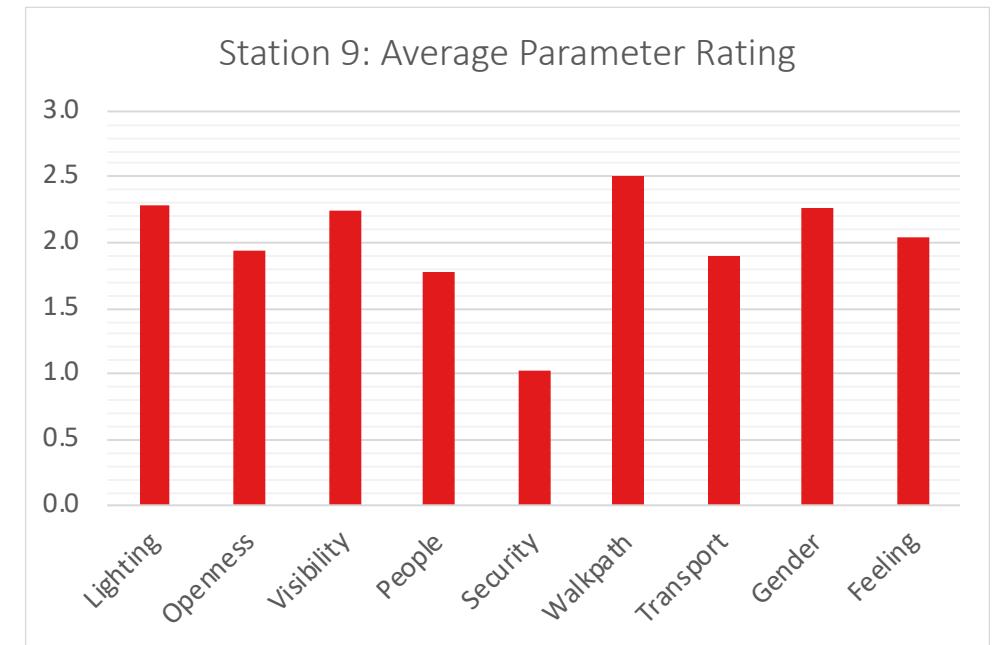
 Overhead

 500 Meter Radius

Base: Google Map

Safety Score 4.3/5





Ngoc Khanh Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Walkpath parameter has been rated the highest, followed by other parameters such as Lighting, Gender Usage and Visibility. Openness, Transport and People parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 9, Ngoc Khanh

**Hanoi Metro Line 3
Ngoc Khanh
Station 9
Lighting**

Legend

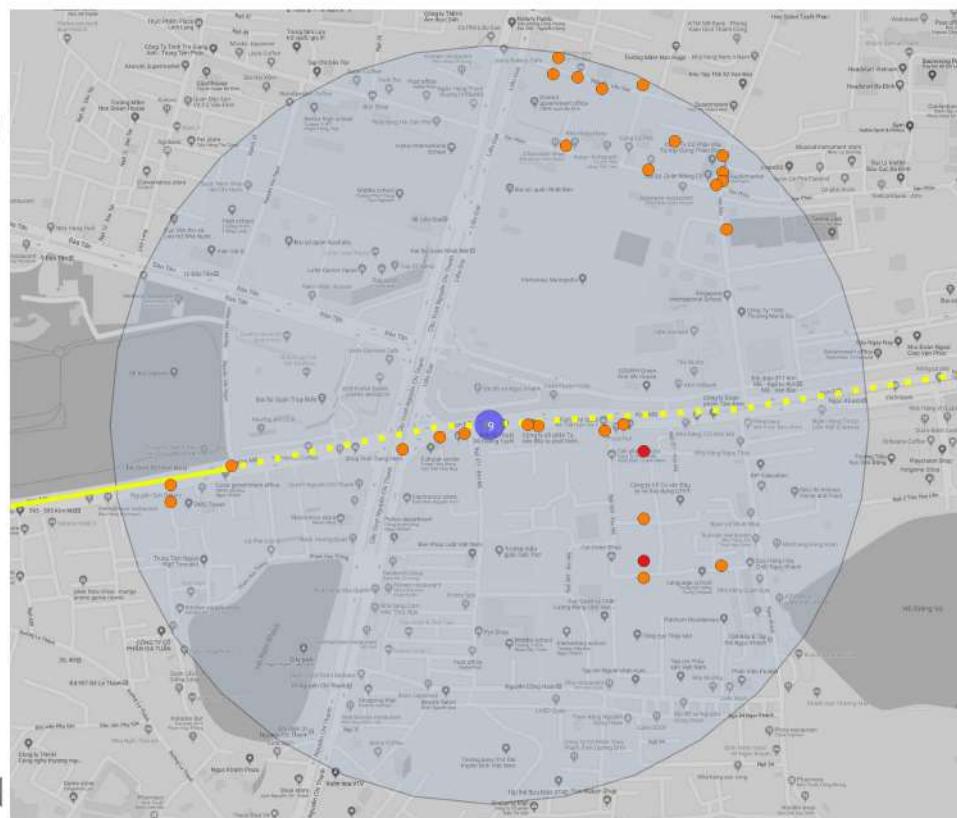
- Metro Station
- Subparameter
- One Sided Street Light
- Metro Line
- Underground
- Overhead
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Ngoc Khanh
Station 9
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Unavailable
- Distant
- Metro Line
- Underground
- Overhead
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

STREET LIGHTS

Map on the left above: showing points for street lights which are within the 500 meter radius of the metro station and are either not present or not working currently.

Recommendation: Street lights as mapped within the zone to be fixed and consequently checked for uniformly lighting up the streets without leaving any dark patches in order to make the entire surrounding clearly visible. Well light street is the top most important factor which adds positively towards the perception of safety.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women’s accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

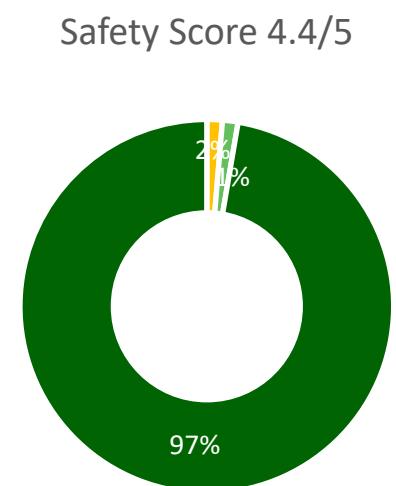
An excel sheet of Station No. 09 showing all the information stored in each geo-tagged point with supporting images:

ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
551758	21.03288	105.8103	8/19/2018 18:41	45626	3	2	3	3	2	1	3	3	2	4.6	015346788791.jpg	115346788791.jpg	215346788791.jpg
571926	21.03091	105.8188	8/25/2018 20:47	17333	3	2	0	1	1	3	3	3	2	4.4	204749-10931.jpg	204753-10931.jpg	
571927	21.03082	105.8181	8/25/2018 20:47	17333	3	2	0	1	1	3	3	3	2	4.4	204741-10931.jpg		
571928	21.03076	105.8172	8/23/2018 20:44	17333	3	2	2	1	0	3	2	3	2	4.4	204418-10892.jpg	204414-10892.jpg	
571929	21.03058	105.8164	8/23/2018 20:43	17333	3	3	3	1	1	3	2	3	2	4.6	204359-10892.jpg	204405-10892.jpg	
571930	21.031	105.8175	8/23/2018 20:35	17333	3	3	2	2	0	3	3	2	2	4.5	203549-10892.jpg	203545-10892.jpg	
571931	21.03104	105.8182	8/23/2018 20:35	17333	2	2	2	1	1	3	3	3	2	4.4	203533-10892.jpg	203537-10892.jpg	
571936	21.03183	105.8172	8/23/2018 20:36	17333	3	2	1	1	2	3	2	3	2	4.4	203613-10892.jpg	203620-10892.jpg	
571937	21.03273	105.8171	8/23/2018 20:36	17333	3	2	1	2	1	3	1	2	2	4.3	203628-10892.jpg	203634-10892.jpg	
551771	21.0294	105.809	8/19/2018 18:44	45556	3	1	3	2	2	2	3	3	2	4.6	115346790631.png		
571938	21.03325	105.8169	8/23/2018 20:36	17333	3	2	0	1	0	3	1	2	1	4	203652-10892.jpg		
551772	21.0294	105.8089	8/19/2018 18:44	45777	1	1	1	2	1	2	2	3	2	4.2	015346790791.jpg		
571939	21.03343	105.8161	8/23/2018 20:37	17333	3	2	3	1	2	3	1	3	2	4.5	203709-10892.jpg	203705-10892.jpg	
551776	21.0295	105.809	8/19/2018 18:45	45776	1	2	3	3	2	2	3	3	2	4.6	115346791111.png		
571940	21.03372	105.815	8/23/2018 20:37	17333	3	2	1	1	0	3	1	3	2	4.3	203722-10892.jpg	203726-10892.jpg	
571537	21.02544	105.8109	8/23/2018 19:34	17333	2	2	3	2	0	3	2	2	2	4.4	193422-10891.jpg	193416-10891.jpg	
551777	21.0294	105.809	8/19/2018 18:45	45001	3	3	3	3	2	3	3	3	3	4.9	115346791301.png		
571941	21.0339	105.814	8/23/2018 20:37	17333	2	3	3	1	1	3	2	3	2	4.5	203758-10892.jpg	203804-10892.jpg	
571539	21.0264	105.8101	8/23/2018 19:33	17333	3	2	3	2	0	3	2	3	2	4.5	193334-10891.jpg	193328-10891.jpg	
551778	21.0295	105.809	8/19/2018 18:50	45645	3	3	3	3	2	2	3	3	3	4.9	115346791391.png		
571942	21.03416	105.8131	8/23/2018 20:38	17333	3	2	2	1	1	2	2	3	2	4.4	203828-10892.jpg	203836-10892.jpg	
571541	21.02738	105.8093	8/23/2018 19:32	17333	2	2	3	2	0	3	3	3	2	4.5	193255-10891.jpg	193249-10891.jpg	
551779	21.0329	105.8098	8/19/2018 18:46	45632	1	2	2	3	0	2	2	3	2	4.3	015346791821.jpg		
571943	21.03444	105.8121	8/23/2018 20:38	17333	3	2	3	2	1	3	1	1	2	4.4	203856-10892.jpg	203902-10892.jpg	
551780	21.02951	105.8091	8/19/2018 18:46	45626	3	2	3	3	3	3	3	3	2	4.8	015346792241.jpg	115346792241.jpg	215346792241.jpg
571944	21.0346	105.8114	8/23/2018 20:39	17333	3	2	2	1	0	3	1	3	2	4.3	203919-10892.jpg		
551781	21.0297	105.81	8/19/2018 18:47	45556	2	2	3	3	2	2	3	3	2	4.6	115346792431.png	215346792431.png	
571946	21.034	105.81	8/23/2018 20:40	17333	3	2	3	3	1	3	1	3	2	4.6	204009-10892.jpg	204015-10892.jpg	
551783	21.02993	105.8108	8/19/2018 18:47	45777	1	1	1	2	1	2	1	3	3	4.3	015346792541.jpg		
571947	21.0334	105.8099	8/23/2018 20:40	17333	3	2	3	2	1	3	2	3	2	4.6	204041-10892.jpg	204033-10892.jpg	
551784	21.0297	105.811	8/19/2018 18:52	45645	3	3	3	3	2	2	3	3	2	4.8	115346792561.png		
571948	21.03263	105.8097	8/23/2018 20:41	17333	3	2	2	1	1	2	2	3	2	4.4	204107-10892.jpg	204101-10892.jpg	
551785	21.0298	105.811	8/19/2018 18:47	45001	2	3	3	3	1	2	3	3	3	4.8	115346792641.png		
551786	21.02948	105.8091	8/19/2018 18:48	45632	1	2	2	3	1	2	2	3	2	4.4	015346792951.jpg		
551787	21.0298	105.81	8/19/2018 18:48	45776	1	1	3	3	2	2	2	3	2	4.4	115346793041.png		
551788	21.03013	105.8115	8/19/2018 18:49	45646	2	2	2	3	1	2	3	3	2	4.5	015346793431.jpg		
551789	21.02983	105.8111	8/19/2018 18:49	45632	1	2	2	3	1	2	2	3	2	4.4	015346794001.jpg		
551488	21.03001	105.8107	8/17/2018 18:58	45647	2	1	1	2	2	3	2	3	2	4.4	015345071021.jpg		
551489	21.0295	105.81	8/17/2018 19:01	45675	1	1	1	1	1	2	1	3	2	4.1	115345071731.png		
551490	21.03046	105.8105	8/17/2018 19:00	45647	2	2	2	3	2	2	3	3	2	4.6	015345072411.jpg		
570971	21.02964	105.8095	8/20/2018 19:11	17333	2	2	3	2	0	3	2	2	2	4.4	191110-10855.jpg	191119-10855.jpg	
551491	21.0297	105.81	8/17/2018 19:02	45675	1	1	1	1	1	2	1	3	2	4.1	115345072781.png		
551492	21.03008	105.8106	8/17/2018 19:01	45647	2	1	2	3	2	2	2	3	2	4.4	015345073091.jpg		
551493	21.03002	105.8107	8/17/2018 19:02	45647	3	3	3	3	2	2	3	3	3	4.9	015345073681.jpg		

Tenth Station of Hanoi Metro Line 3

Cat Linh Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, walkpath and transport was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

CAT LINH

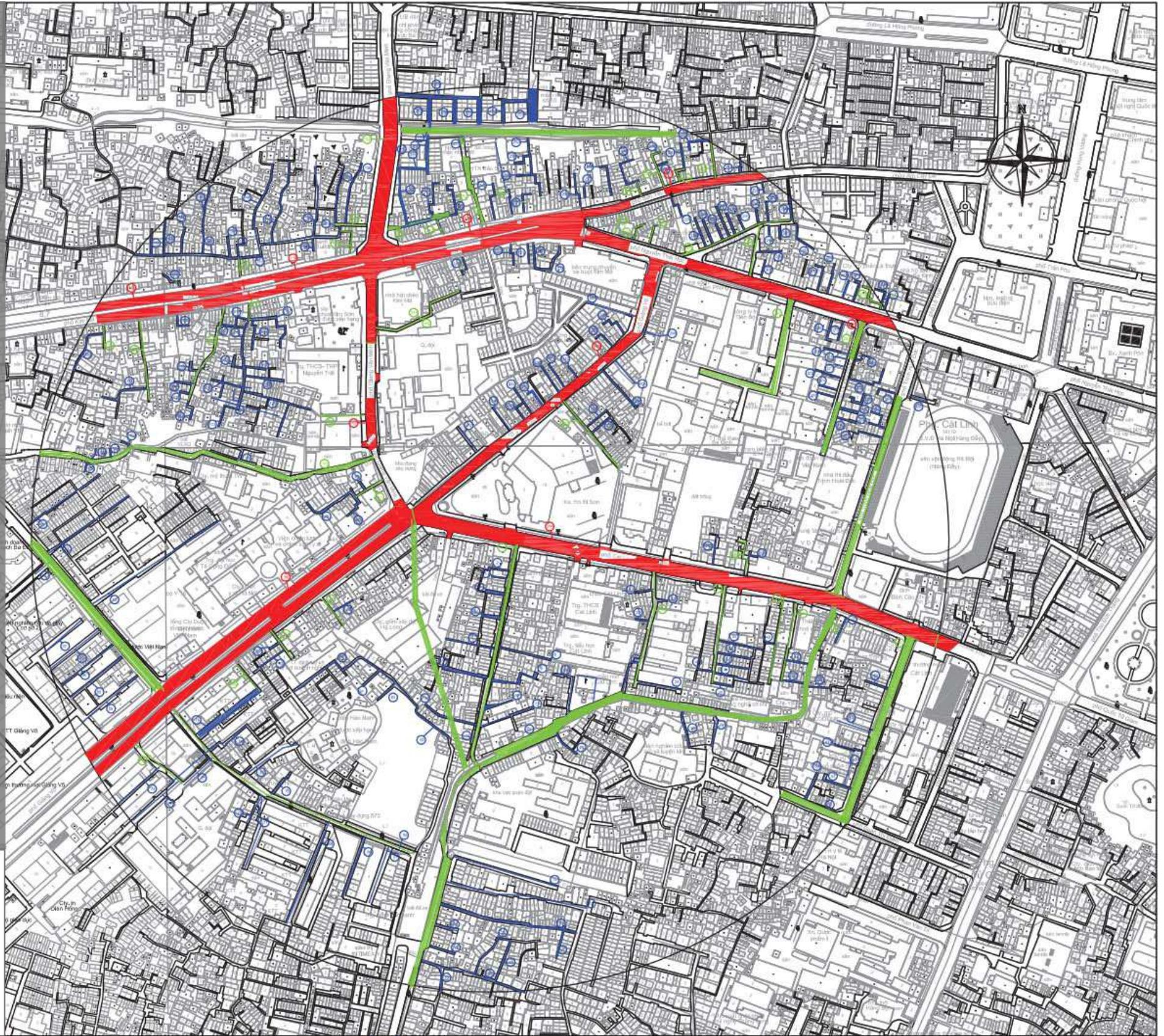


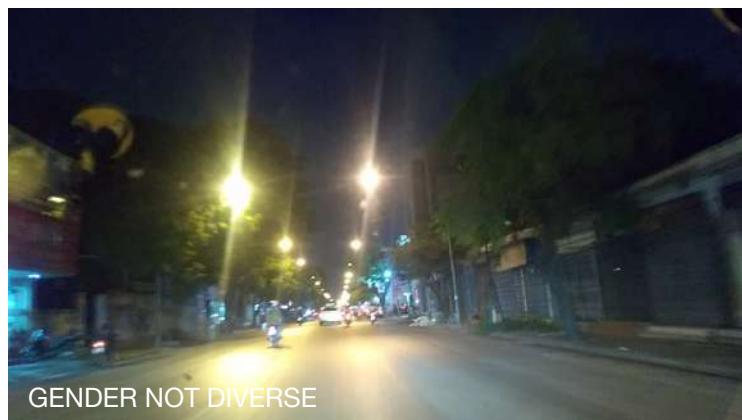
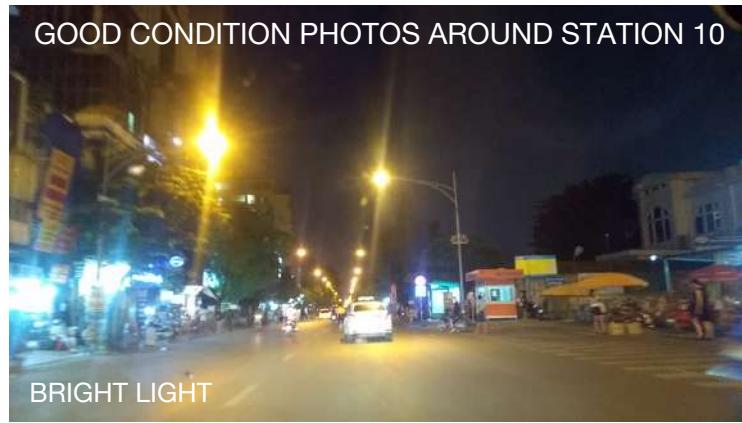
SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





149 Audit Pins within 500m radius of Cat Linh Station

A total of 149 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 10 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.4 on a scale of 5 is given for Station Cat Linh (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 97% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to average, where only 1% is good and the remaining 2% is average. There are no scores for below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	0
Average	2.1 - 3.0	2
Good	3.1 - 4.0	2
Excellent	4.1 - 5.0	145

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Cat Linh Station 10 Safety Score

Legend

 Metro Station

Safety Audits

 Average

 Good

 Excellent

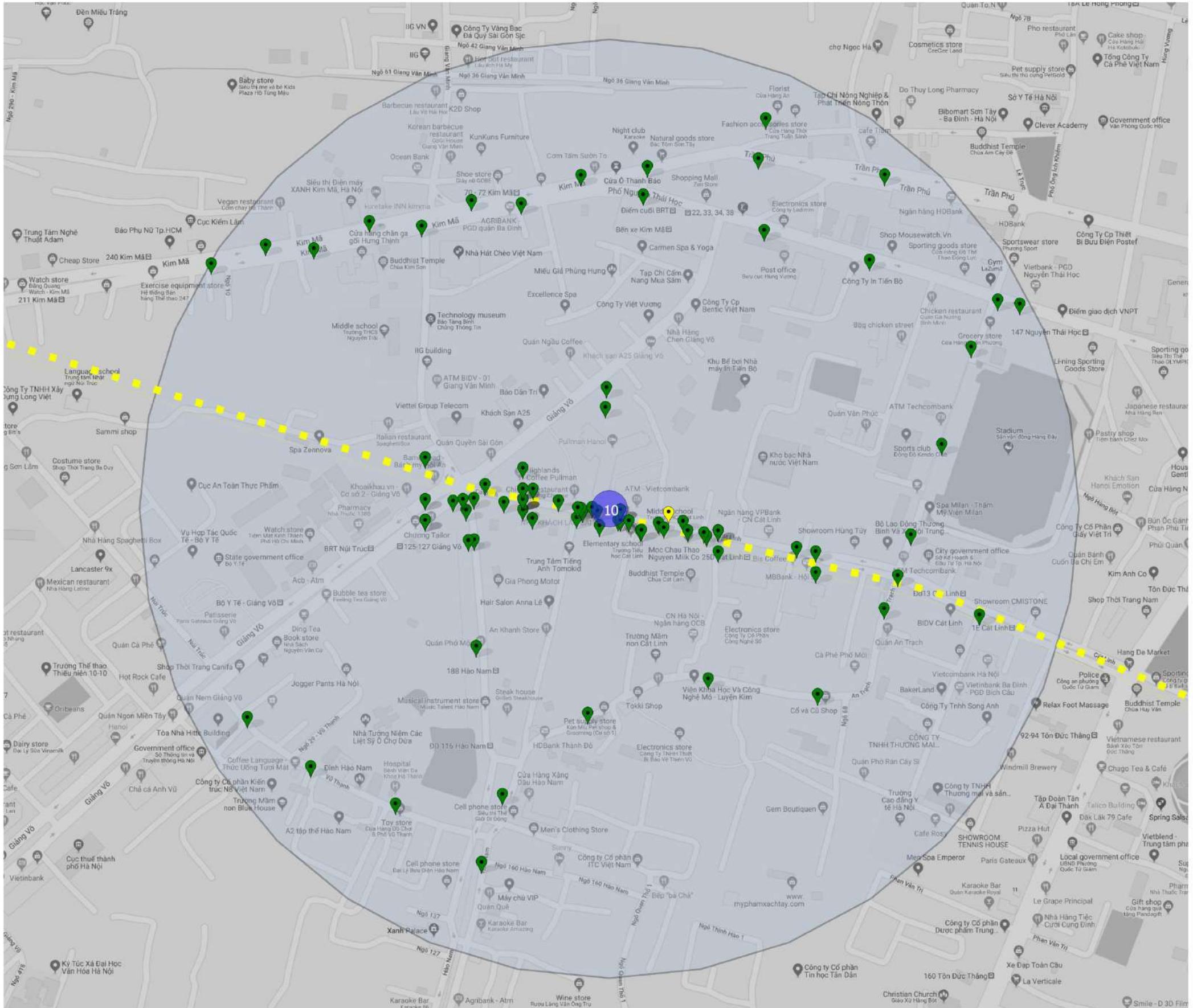
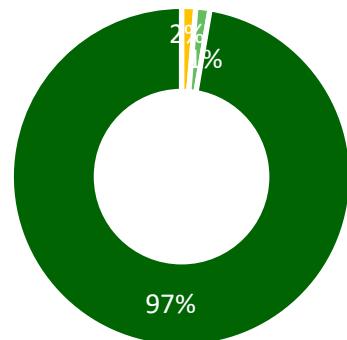
Metro Line

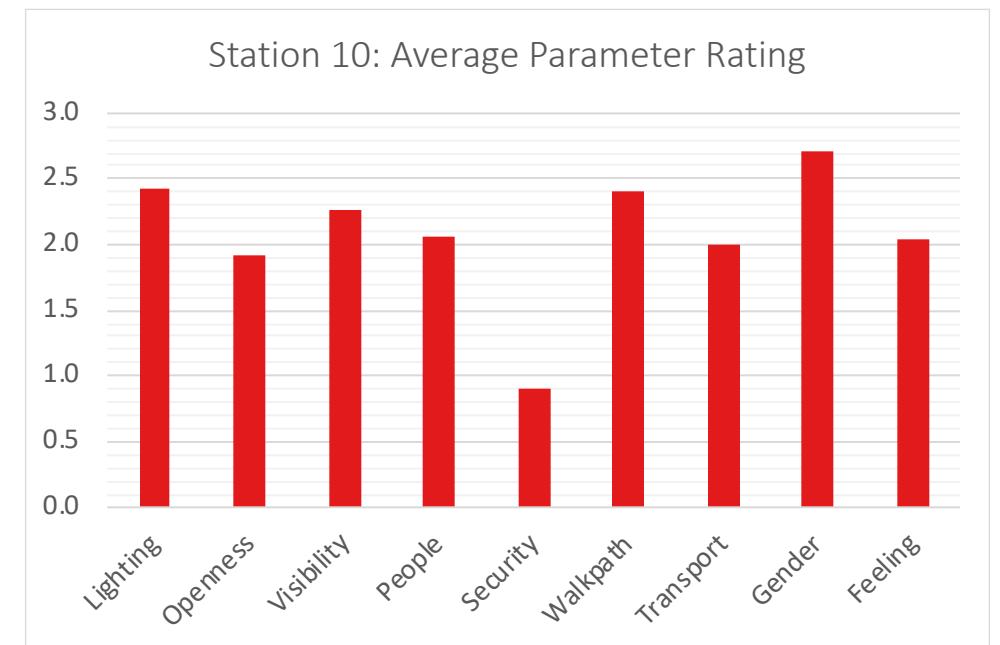
 Underground

 500 Meter Radius

Base: Google Map

Safety Score 4.4/5





Cat Linh Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Gender Usage parameter has been rated the highest, followed by other parameters such as Lighting, Walkpath and Visibility. People, Transport and Openness parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 10, Cat Linh

**Hanoi Metro Line 3
Cat Linh
Station 10
Walkpath**

Legend

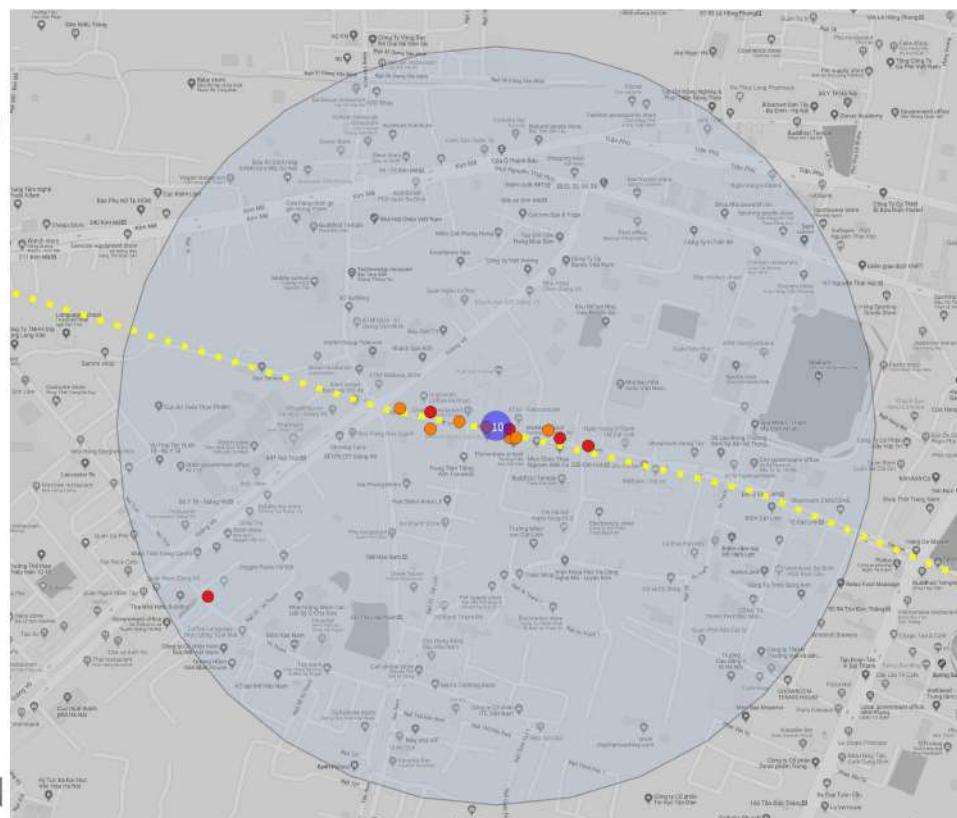
- Metro Station
- Subparameter
- Other Blocking
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Cat Linh
Station 10
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Unavailable
- Distant
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women’s accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

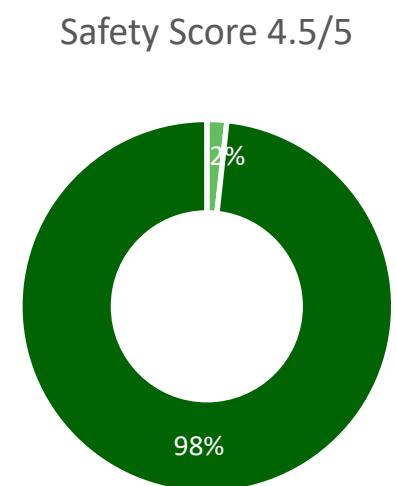
An excel sheet of Station No. 10 showing all the information stored in each geo-tagged point with supporting images:

ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
571900	21.0295	105.8207	8/23/2018 19:49	17333	3	2	0	2	0	3	1	2	2	4.2	194942-10892.jpg	194948-10892.jpg	
551389	21.03081	105.8196	8/14/2018 18:48	45603	1	2	2	2	0	3	2	3	2	4.3	015342472711.jpg		
571904	21.02959	105.82	8/23/2018 19:49	17333	2	2	1	1	0	3	1	3	2	4.2	194928-10892.jpg		
551391	21.0308	105.82	8/14/2018 18:49	45612	2	3	2	2	2	3	2	3	3	4.7	115342473061.png		
571905	21.03058	105.8197	8/23/2018 19:48	17333	3	2	3	2	1	3	2	2	2	4.5	194856-10892.jpg	194902-10892.jpg	
571907	21.02969	105.8217	8/25/2018 19:15	17333	3	2	1	1	0	2	1	3	2	4.2	191524-10913.jpg	191528-10913.jpg	
571909	21.03026	105.8224	8/25/2018 19:15	17333	3	2	0	1	0	3	1	3	2	4.2	191508-10913.jpg		
571911	21.03077	105.822	8/25/2018 19:14	17333	3	2	3	2	0	3	2	2	2	4.4	191442-10913.jpg		
571913	21.03125	105.8216	8/25/2018 20:48	17333	3	3	3	1	1	3	2	3	2	4.6	204828-10931.jpg	204824-10931.jpg	
571478	21.02801	105.8334	8/25/2018 19:25	17333	3	2	3	1	2	3	3	3	3	4.8	192513-10913.jpg	192506-10913.jpg	
571915	21.03154	105.8227	8/23/2018 20:34	17333	3	2	3	2	1	3	3	2	2	4.6	203419-10892.jpg	203423-10892.jpg	
571482	21.0283	105.8327	8/25/2018 19:24	17333	3	2	2	1	1	3	3	3	2	4.5	192454-10913.jpg	192458-10913.jpg	
571917	21.03165	105.8237	8/23/2018 20:34	17333	3	2	3	2	0	3	3	2	2	4.5	203406-10892.jpg		
571486	21.02867	105.8318	8/25/2018 19:23	17333	3	2	2	3	1	2	3	3	2	4.6	192309-10913.jpg	192303-10913.jpg	
571919	21.03178	105.8246	8/23/2018 20:33	17333	3	2	3	2	1	3	3	2	2	4.6	203346-10892.jpg	203350-10892.jpg	
571920	21.03184	105.8254	8/23/2018 20:33	17333	3	2	3	2	0	3	2	2	2	4.4	203336-10892.jpg	203328-10892.jpg	
571921	21.03206	105.8264	8/23/2018 20:33	17333	3	2	3	2	1	3	2	2	2	4.5	203310-10892.jpg	203306-10892.jpg	
571922	21.03226	105.8275	8/23/2018 20:32	17333	3	2	3	2	1	3	3	2	2	4.6	203247-10892.jpg	203243-10892.jpg	
571923	21.0325	105.8286	8/23/2018 20:32	17333	3	2	3	2	0	3	2	2	2	4.4	203227-10892.jpg	203221-10892.jpg	
571924	21.03122	105.8207	8/23/2018 20:45	17333	3	2	2	1	1	3	1	3	2	4.4	204503-10892.jpg	204811-10931.jpg	
571925	21.03109	105.8197	8/23/2018 20:44	17333	2	2	0	1	1	3	2	3	2	4.3	204451-10892.jpg	204802-10931.jpg	
571932	21.03118	105.819	8/23/2018 20:35	17333	1	2	0	1	1	3	2	3	2	4.2	203525-10892.jpg		
571933	21.03128	105.8198	8/23/2018 20:35	17333	2	2	0	2	1	3	2	2	2	4.3	203514-10892.jpg		
571934	21.03138	105.8208	8/23/2018 20:34	17333	3	2	1	2	2	3	1	2	2	4.4	203459-10892.jpg	203455-10892.jpg	
571935	21.03151	105.8218	8/23/2018 20:34	17333	3	3	2	1	1	3	2	3	2	4.5	203437-10892.jpg	203441-10892.jpg	
551426	21.0289	105.83	8/14/2018 19:49	45612	3	3	2	3	2	2	2	3	2	4.6	115343910591.png	215343910591.png	
551427	21.0291	105.83	8/14/2018 19:53	45612	2	2	1	3	1	2	2	3	2	4.4	115343910631.png	215343910631.png	315343910631.png
551428	21.0287	105.831	8/14/2018 19:57	45612	3	3	3	2	2	3	2	2	3	4.8	115343910691.png	215343910691.png	315343910691.png
551438	21.0295	105.828	8/15/2018 19:34	45616	1	2	2	2	0	2	0	2	2	4.1	115343945051.png	215343945051.png	
551439	21.0295	105.828	8/15/2018 19:36	45616	2	2	2	2	0	3	0	2	2	4.2	115343945081.png	215343945081.png	
551440	21.0294	105.828	8/15/2018 19:38	45616	2	2	2	2	0	2	2	2	2	4.3	115343945101.png	215343945101.png	
551441	21.0293	105.829	8/15/2018 19:43	45616	3	3	2	1	1	1	0	2	2	4.2	115343945121.png	215343945121.png	
551791	21.0294	105.828	8/19/2018 19:02	45001	2	2	3	3	1	3	2	3	2	4.6	115346801561.png		
551792	21.03305	105.8305	8/19/2018 19:02	45632	3	2	2	3	1	2	2	3	2	4.5	015346801701.jpg		
551793	21.0294	105.828	8/19/2018 19:02	45556	2	1	3	3	2	2	3	3	2	4.6	115346801771.png		
551794	21.02954	105.8276	8/19/2018 19:02	45777	1	1	1	2	1	2	1	2	2	4.1	015346801831.jpg		
551797	21.0295	105.828	8/19/2018 19:03	45776	2	1	3	3	2	2	1	3	2	4.4	115346802021.png		
551798	21.0294	105.828	8/19/2018 19:08	45645	1	2	3	3	2	2	3	3	2	4.6	115346802271.png		
551800	21.0294	105.828	8/19/2018 19:04	45556	2	1	3	3	3	2	3	3	2	4.6	115346802581.png		
551801	21.0295	105.8281	8/19/2018 19:02	45648	3	3	3	2	2	2	3	3	3	4.8	015346802621.jpg		
551802	21.0293	105.829	8/19/2018 19:04	45776	2	1	3	3	2	2	1	3	2	4.4	115346802651.png		
551803	21.02939	105.8284	8/19/2018 19:04	45777	1	1	1	1	1	2	1	2	2	4	015346802721.jpg		
551804	21.03028	105.8288	8/19/2018 19:04	45646	2	2	1	3	1	2	2	3	2	4.4	015346802851.jpg		
551805	21.02922	105.8286	8/19/2018 19:04	45632	1	1	1	3	0	2	2	3	2	4.2	015346802991.jpg	115346802991.jpg	

Eleventh Station of Hanoi Metro Line 3

Van Mieu Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, walkpath and transport was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

VAN MIEU

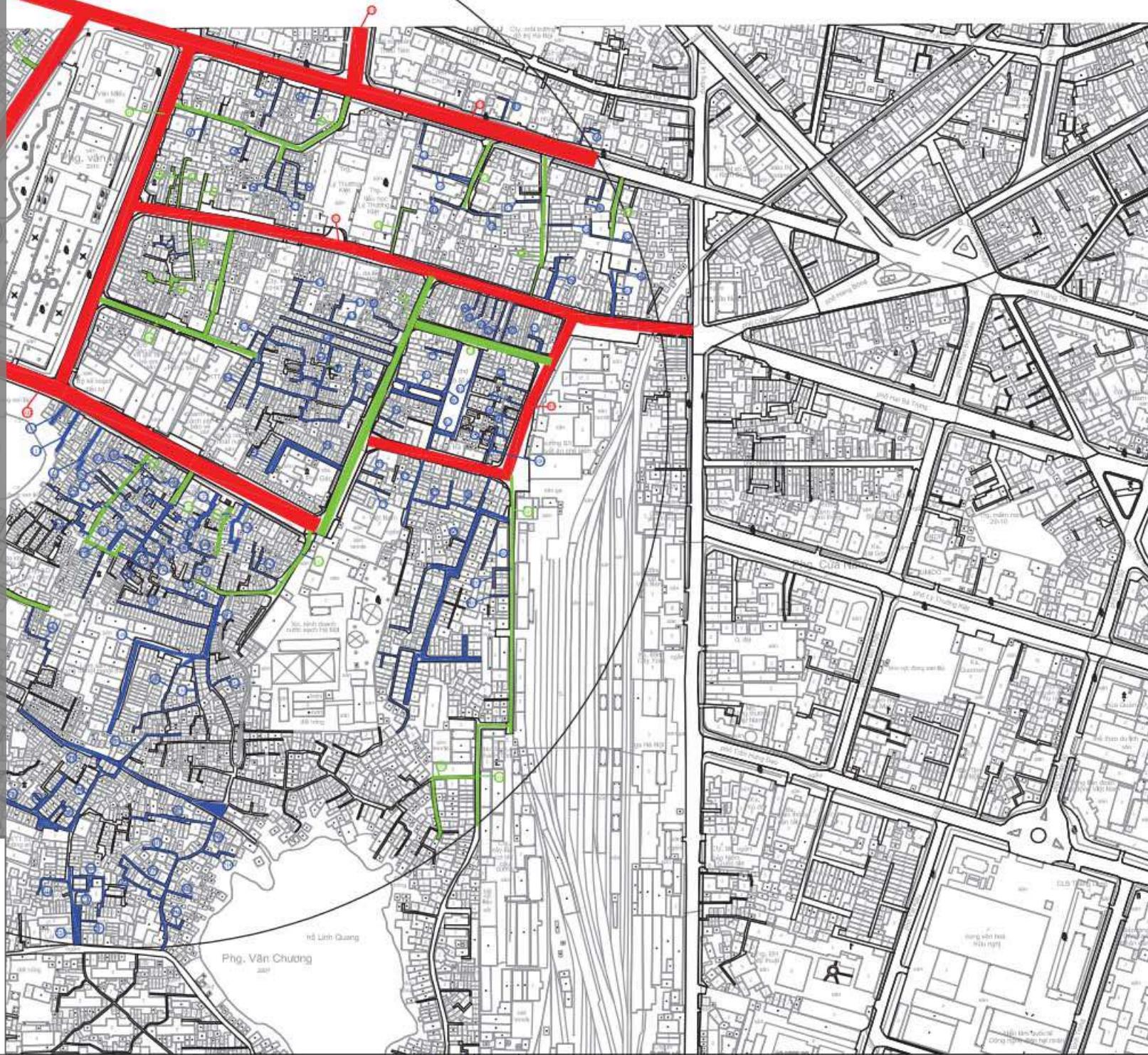


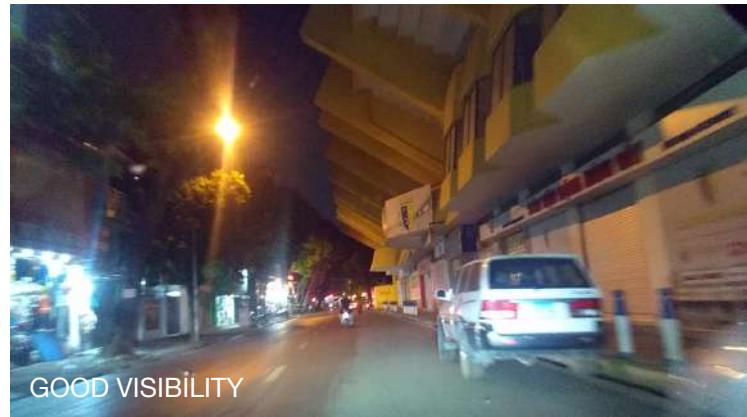
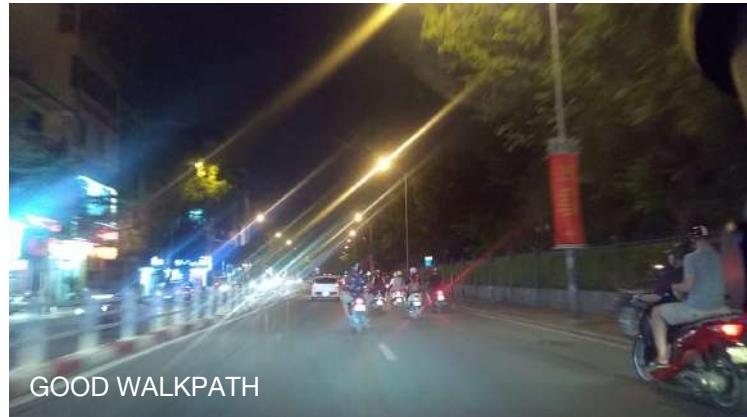


SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014





116 Audit Pins within 500m radius of Van Mieu Station

A total of 116 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 11 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.5 on a scale of 5 is given for Station Van Mieu (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 98% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where only 2% is good and there are no scores for average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	0
Average	2.1 - 3.0	0
Good	3.1 - 4.0	2
Excellent	4.1 - 5.0	114

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Van Mieu Station 11 Safety Score

Legend

 Metro Station

Safety Audits

 Good

 Excellent

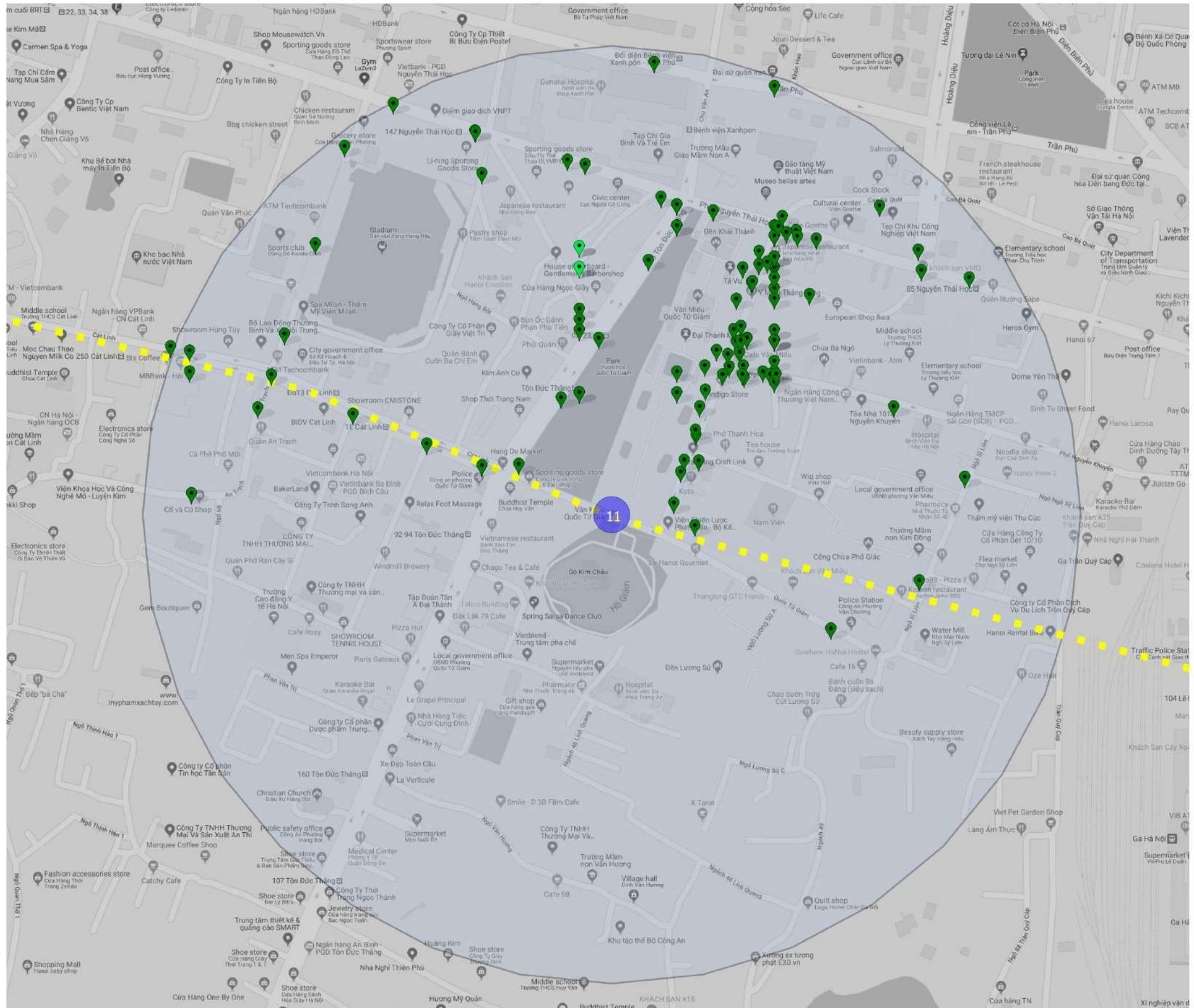
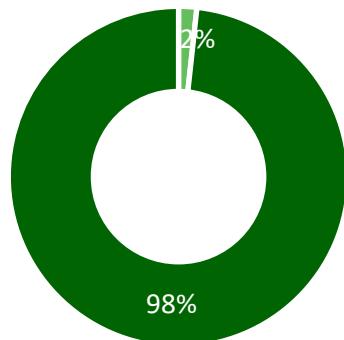
Metro Line

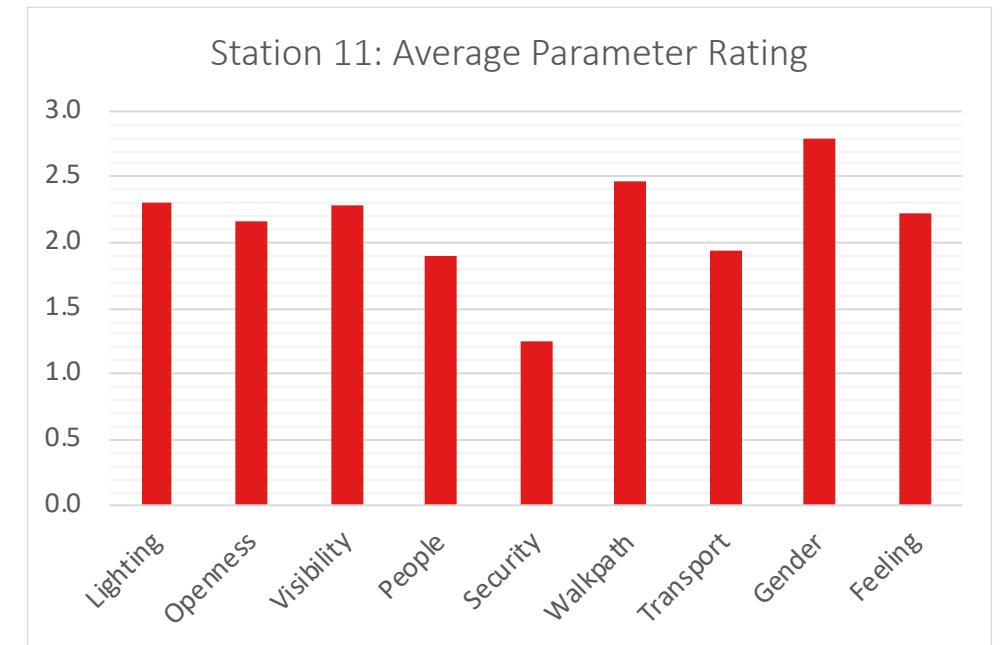
 Underground

 500 Meter Radius

Base: Google Map

Safety Score 4.5/5





Van Mieu Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Gender Usage parameter has been rated the highest, followed by other parameters such as Walkpath, Lighting, and Visibility. Openness, People and Transport parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 11, Van Mieu

**Hanoi Metro Line 3
Van Mieu
Station 11
Walkpath**

Legend

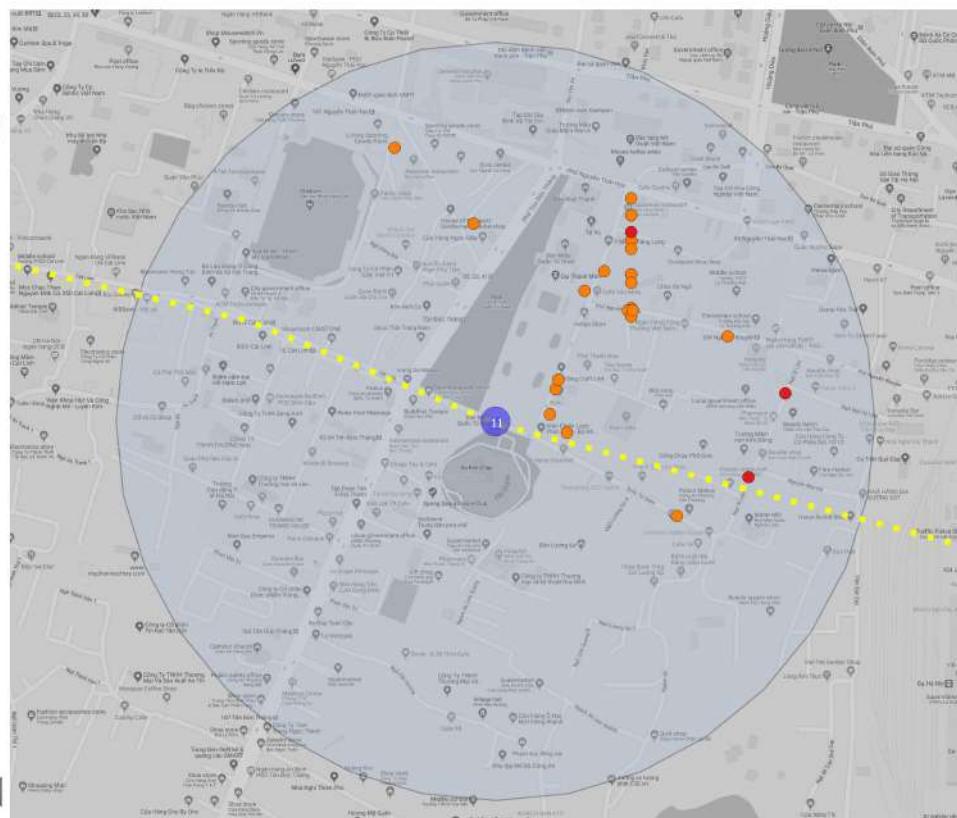
- Metro Station
- Subparameter
- Other Blocking
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Van Mieu
Station 11
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Unavailable
- Distant
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women's accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 11 showing all the information stored in each geo-tagged point with supporting images:

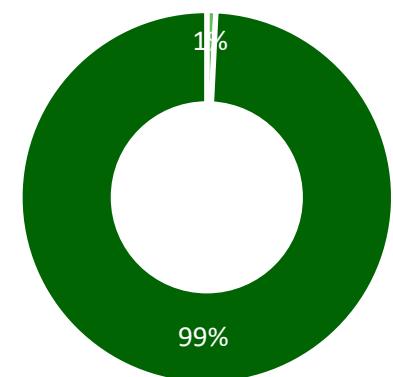
ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
571746	21.02624	105.8376	8/25/2018 19:32	17333	2	2	3	1	3	2	1	3	2	4.4	193245-10916.jpg	193239-10916.jpg	
571749	21.0267	105.8385	8/25/2018 19:33	17333	2	2	3	1	2	2	0	3	2	4.3	193330-10916.jpg	193336-10916.jpg	
571751	21.02769	105.839	8/25/2018 19:34	17333	3	2	3	3	1	1	0	3	2	4.4	193415-10916.jpg	193407-10916.jpg	
571753	21.02837	105.8382	8/25/2018 19:34	17333	3	2	3	1	1	2	1	3	2	4.4	193459-10916.jpg	193505-10916.jpg	
571756	21.02868	105.837	8/25/2018 19:35	17333	3	2	3	1	0	2	1	3	2	4.3	193528-10916.jpg	193524-10916.jpg	
571757	21.02944	105.8374	8/25/2018 19:29	17333	3	1	3	1	0	2	2	3	2	4.3	192958-10913.jpg	192952-10913.jpg	
551428	21.0287	105.831	8/14/2018 19:57	45612	3	3	3	2	2	3	2	2	3	4.8	115343910691.png	215343910691.png	315343910691.png
571761	21.02987	105.8385	8/23/2018 20:26	17333	3	2	1	0	1	3	2	2	2	4.3	202626-10892.jpg	193714-10916.jpg	
551429	21.0297	105.837	8/14/2018 20:11	45612	3	3	2	3	2	3	2	3	3	4.8	115343910721.png	215343910721.png	
551430	21.0291	105.837	8/14/2018 20:16	45612	3	3	3	2	2	3	1	2	3	4.7	115343910761.png	215343910761.png	
571765	21.03091	105.8386	8/23/2018 20:26	17333	3	2	1	2	1	3	2	2	2	4.4	202600-10892.jpg		
551442	21.0295	105.837	8/15/2018 20:06	45616	2	2	2	2	0	3	1	3	2	4.3	115343945151.png	215343945151.png	
551443	21.0288	105.837	8/15/2018 20:07	45616	2	2	2	1	0	3	2	1	2	4.2	115343945191.png	215343945191.png	
551444	21.029	105.837	8/15/2018 20:08	45616	2	1	2	2	0	2	2	2	2	4.2	115343945241.png	215343945241.png	
570993	21.03121	105.8381	8/23/2018 20:27	17333	3	2	1	1	1	3	2	3	2	4.4	202723-10892.jpg	180540-10887.jpg	
570999	21.03143	105.837	8/23/2018 20:27	17333	3	2	1	1	1	3	2	3	2	4.4	202739-10892.jpg	180606-10887.jpg	
552267	21.0278	105.834	8/24/2018 18:13	21048	3	3	1	1	1	3	3	3	3	4.6	115354480371.png	215354480371.png	315354480371.png
571005	21.03167	105.8358	8/23/2018 20:28	17333	3	2	2	1	0	3	3	3	2	4.4	202839-10892.jpg	180557-10860.jpg	
552268	21.0293	105.835	8/24/2018 18:26	21048	2	2	1	1	1	2	2	2	2	4.2	115354480401.png	215354480401.png	
552269	21.0297	105.835	8/24/2018 18:29	21048	1	1	1	1	0	2	1	2	2	3.5	115354480431.png	215354480431.png	
552270	21.0306	105.834	8/24/2018 18:33	21048	2	3	3	3	1	2	1	3	3	4.6	115354480461.png	215354480461.png	
551644	21.03009	105.837	8/18/2018 19:22	45842	3	2	2	3	1	3	2	3	2	4.6	015345949281.jpg	015345949281.jpg	215345949281.jpg
571011	21.03196	105.8343	8/23/2018 20:29	17333	3	2	1	1	0	3	2	3	2	4.3	202930-10892.jpg	202936-10892.jpg	
551645	21.03	105.837	8/18/2018 19:22	45616	3	3	2	2	0	2	1	2	2	4.3	115345949341.png	215345949341.png	315345949341.png
571017	21.03228	105.8328	5/23/2018 11:02	17333	3	2	1	1	1	3	1	3	2	4.3	110203-10547.jpg	203058-10892.jpg	
551649	21.03005	105.8372	8/18/2018 19:23	45829	2	3	3	3	1	3	2	3	3	4.8	015345950421.jpg	015345950421.jpg	215345950421.jpg
551651	21.03004	105.8371	8/18/2018 19:24	45827	2	1	1	2	1	2	2	2	2	4.2	015345950991.jpg	015345950991.jpg	215345950991.jpg
551652	21.03009	105.837	8/18/2018 19:24	45842	3	2	3	3	2	3	2	3	2	4.7	015345951021.jpg	015345951021.jpg	
551820	21.0289	105.831	8/19/2018 19:13	45645	2	3	3	3	3	2	3	3	3	4.9	115346805131.png		
552391	21.0285	105.835	8/24/2018 18:17	45922	2	2	2	2	2	2	3	3	2	4.5	115356466641.png	215356466641.png	
551825	21.0297	105.8367	8/19/2018 19:16	45777	2	2	1	1	1	3	2	2	2	4.3	015346809801.jpg	015346809801.jpg	
552392	21.0292	105.835	8/24/2018 18:23	45922	1	2	3	2	2	3	2	3	2	4.5	115356466661.png	215356466661.png	315356466661.png
552393	21.0301	105.836	8/24/2018 18:28	45922	2	3	3	1	3	1	2	2	2	4.4	115356466691.png	215356466691.png	315356466691.png
552394	21.0299	105.835	8/24/2018 18:35	45922	2	1	3	1	0	0	2	2	1	3.5	115356466711.png	215356466711.png	
551831	21.0298	105.837	8/19/2018 19:16	45776	2	2	3	2	1	2	1	3	2	4.4	115346810181.png		
552630	21.0285	105.835	8/24/2018 18:17	42191	2	2	2	2	1	2	3	2	2	4.4	115361465211.png		
551833	21.02986	105.8368	8/19/2018 19:16	44822	3	3	3	3	3	3	2	3	3	4.9	015346810921.jpg		
552631	21.0291	105.835	8/24/2018 18:21	42191	1	1	2	3	1	3	2	3	2	4.4	115361465231.png		
551835	21.02973	105.8368	8/19/2018 19:17	45648	2	3	3	2	2	2	2	3	3	4.7	015346811511.jpg		
552632	21.0301	105.836	8/24/2018 18:28	42191	1	2	2	3	2	2	2	3	2	4.4	115361465261.png		
551836	21.0298	105.837	8/19/2018 19:17	45001	2	3	3	3	2	3	2	3	3	4.8	115346811631.png		
571422	21.02753	105.831	8/23/2018 19:59	17333	3	2	3	1	0	3	2	3	2	4.4	195902-10892.jpg	195906-10892.jpg	
551837	21.02956	105.8368	8/19/2018 19:18	44822	3	3	3	3	3	3	2	3	3	4.9	015346811651.jpg		
571423	21.02836	105.8317	8/23/2018 19:59	17333	3	2	2	1	1	3	2	3	2	4.4	195937-10892.jpg	195932-10892.jpg	

Twelfth Station of Hanoi Metro Line 3

Hanoi Railway Station when audited by Safetipin was found to have a good proportion of women and girls present within the 500m radius. It was further seen that at certain points where women/girls were present, walkpath and transport was poor or missing and parameters like openness, people and security needed more attention. In the following data analysis of this station it can be understood how to use these findings to improve accessibility and mobility for women and girls.

HANOI RW STATION

Safety Score 4.5/5

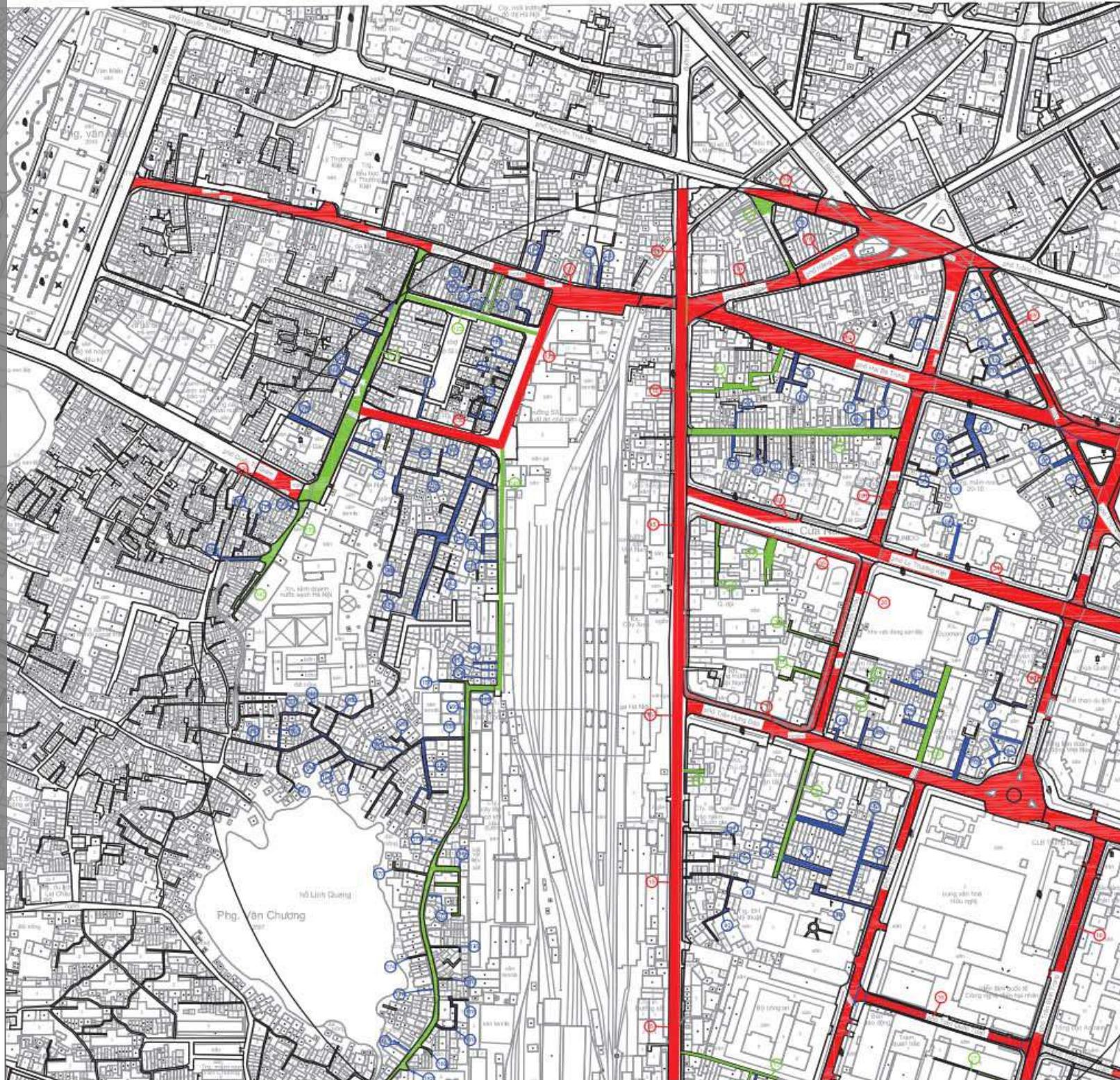


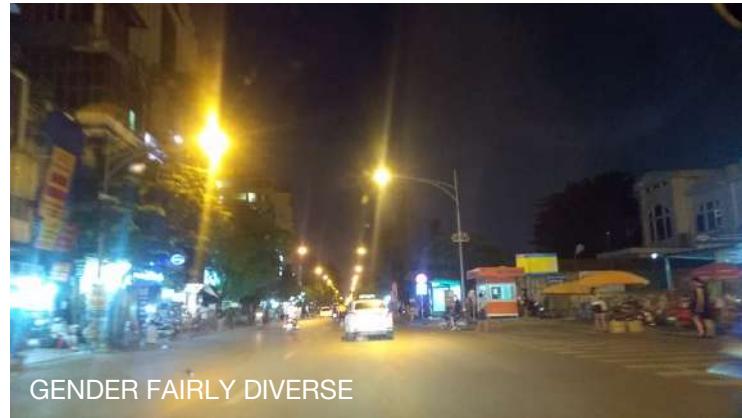
SAFETIPIN audited all the main roads, level 1 alleys marked here and wherever possible some of the level 2 alleys as well. The yellow highlighted zone was a constraint zone as it had very narrow lanes where cars couldn't reach and manual audit volunteers felt unsafe to enter at night. The above map has been used as a guide to understand street network within 500 meter radius and to align Safetipin findings in support of the last mile connectivity improvement plan provided by the report.

MAP SOURCE:

Engineering Design Report, 18 APR 2014

-  Main Roads
-  Level 1 Alleys
-  Level 2 Alleys
-  Areas with no direct access route to the metro station





128 Audit Pins within 500m radius of Hanoi Railway Station

A total of 128 audit pins were generated by the volunteers using 'My Safetipin' app and by the hired vehicles using 'Safetipin Nite' app. The images shown on the left are from these audits used here to highlight the condition of the physical and social parameters considered for evaluating the area around Station No. 12 of Hanoi Metro Line 3.

The first row of images here illustrate the quality of the street lighting after nightfall – both of good and poor condition. The second row shows the quality of the sidewalks, the third row shows how visible are people on the streets by others and the fourth row shows the gender diversity of the crowd present after dark. These together with five more parameters (refer Safetipin rubric on page 00) help to collect safety related information of the urban environment.

Based on such collected and coded data a safety score of 4.5 on a scale of 5 is given for Hanoi Railway Station (please refer Safetipin methodology on page 00). The percentage distribution on this scale shows 99% of the overall rating based on all the nine parameters, to be excellent. The rest is distributed from good to poor, where only 1% is good and there are no scores for average, below average and poor.

RATING	RANGE	NO OF PINS
Poor	0.0 - 1.0	0
Below Average	1.1 - 2.0	0
Average	2.1 - 3.0	0
Good	3.1 - 4.0	1
Excellent	4.1 - 5.0	127

Left: Images from Manual and Nite Audits

Hanoi Metro Line 3 Railway Station Station 12 Safety Score

Legend

 Metro Station

Safety Audits

 Good

 Excellent

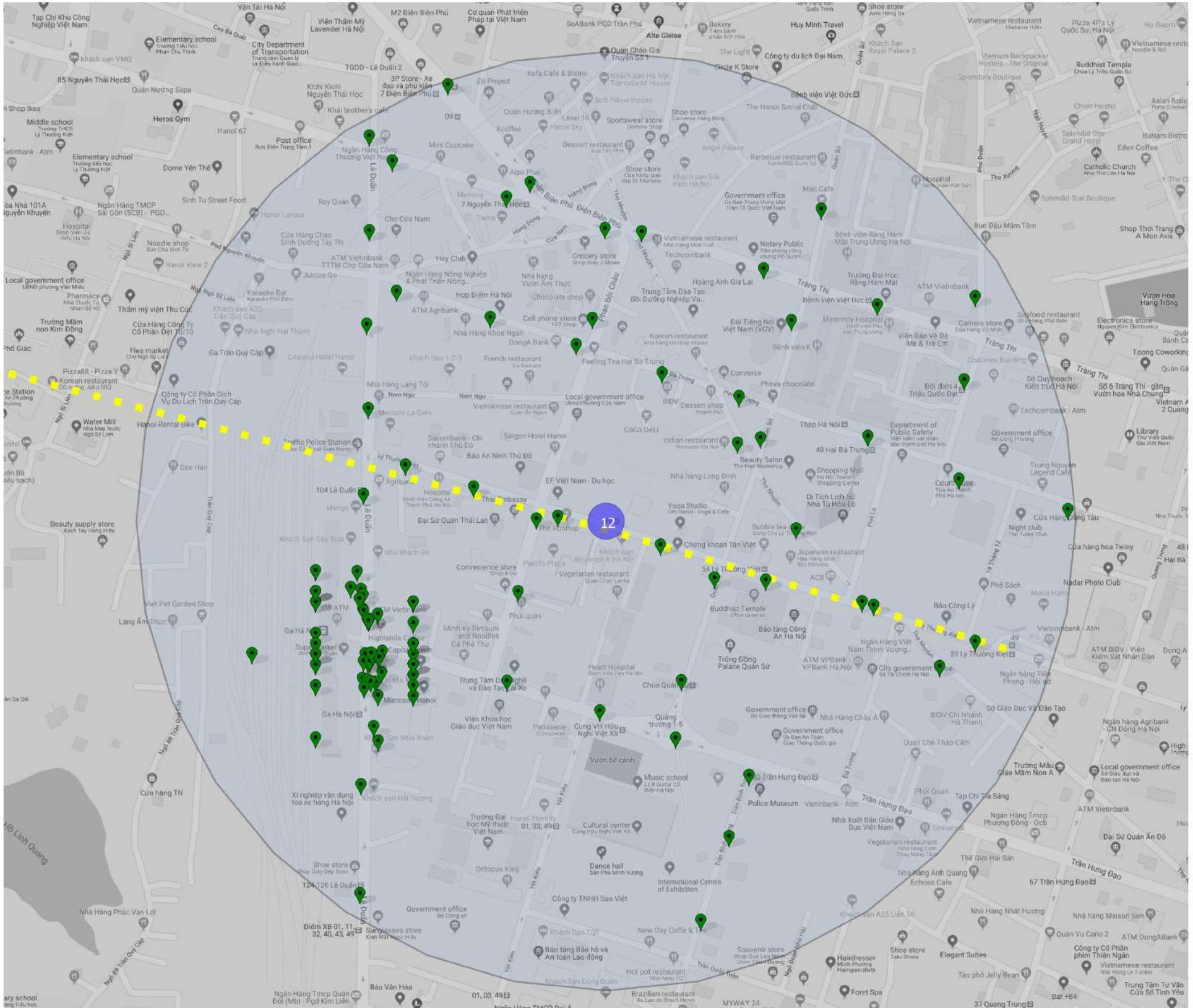
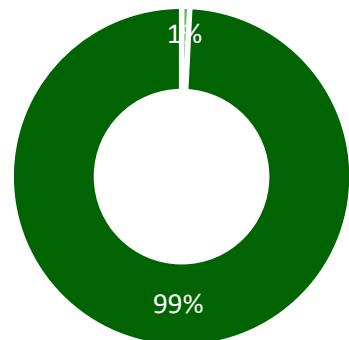
Metro Line

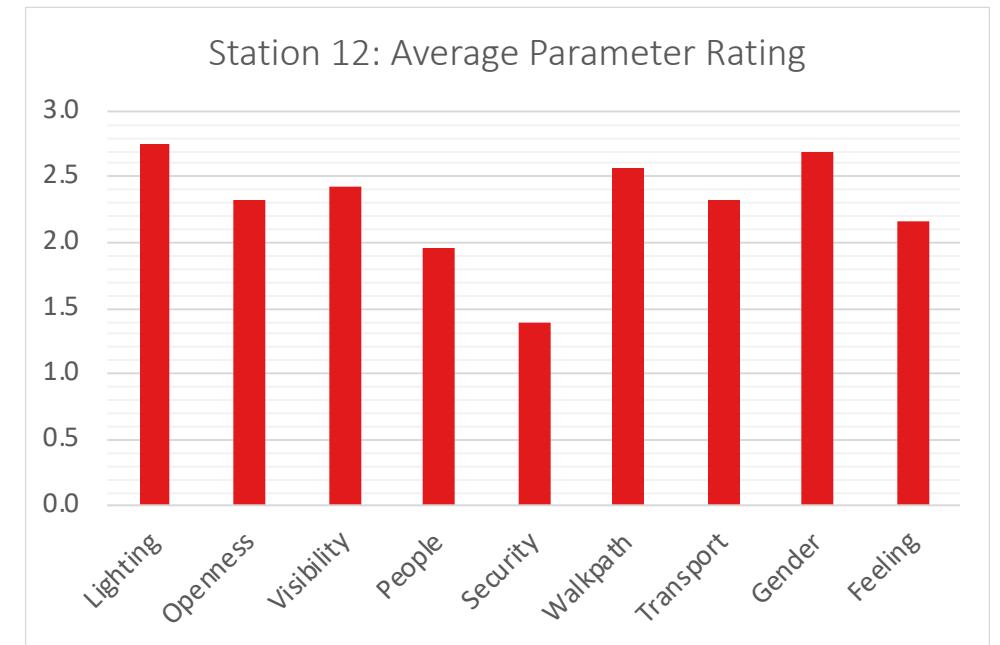
 Underground

 500 Meter Radius

Base: Google Map

Safety Score 4.5/5





Hanoi Railway Station Station:

Average Parameter Rating Graph

The average parameter rating graph illustrates the average rating for each parameter on a scale of three. Each of the nine parameters are rated either 0, 1, 2 or 3, where 0 is poor and 3 is good. As seen on the graph, Lighting parameter has been rated the highest, followed by other parameters such as Gender Usage, Walkpath and Visibility. Openness, Transport and People parameters are rated slightly lower and the parameter Security has been rated the lowest, which probably indicates no or little presence of formal security in public spaces. However, the overall Feeling of Safety or perception of safety for the city of Hanoi is rated Average.

Left: Area around Station No 12, Hanoi Railway Station

**Hanoi Metro Line 3
Railway Station
Station 12
Walkpath**

Legend

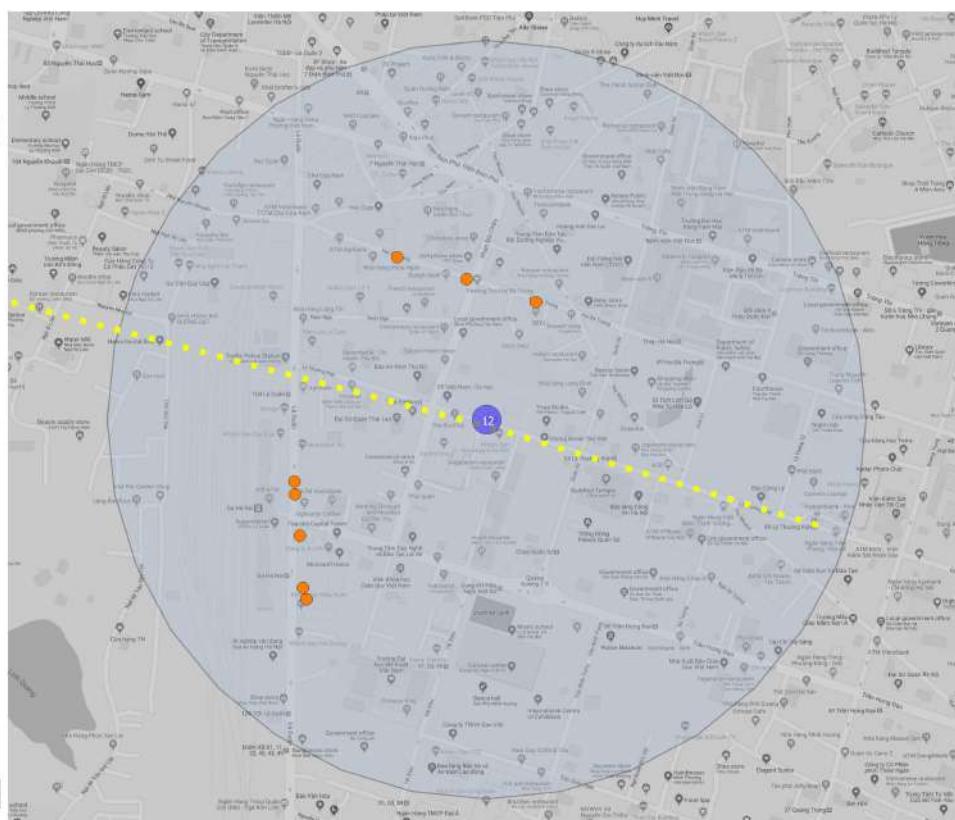
- Metro Station
- Subparameter
- Car Blocking
- Other Blocking
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



**Hanoi Metro Line 3
Railway Station
Station 12
Correlation
(Gender+Transport)**

Legend

- Metro Station
- Public Transport
- Distant
- Metro Line
- Underground
- 500 Meter Radius
- Base: Google Map



Correlated Maps for specific recommendations for infrastructural interventions within 500m radius:

WALKPATH

Map on the left above: showing points for pavements which are within the 500 meter radius of the metro station and are either missing, broken or blocked with/encroached upon currently.

Recommendation: Walkpaths as mapped within the zone to be fixed and consequently checked for blockages due to bikes and cars parked on them or for encroachments by small shops and informal businesses. Pedestrian walkpaths must be clear of any hindrances and the route ahead clearly visible. Well maintained walkpaths improve walkability and increase accessibility for pedestrians.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

NO TRANSPORT WHERE WOMEN ARE PRESENT

Map on the left below: showing points within the 500 meter radius of the metro station where women are present but public transport is unavailable or distant.

Recommendation: It is understood that once metro is operational, mass public transport will be available near these points shown on the map. But robust last mile connectivity to the metro station is key to ensure that metro is available to all. Such measures will improve women's accessibility to the metro and their mobility in general. Due attention to be given to non-motorized transport for such connectivity.

A CSV file is generated (refer next page for details) which has all the geo located audits with supporting photographs for each point, to enable necessary interventions as recommended by Safetipin.

An excel sheet of Station No. 12 showing all the information stored in each geo-tagged point with supporting images:

ID	Latitude	Longitude	Audit Date&Time	CreatedBy	Lighting	Openness	Visibility	People	Security	Walkpath	Transport	Gender	Feeling	Safety Score	Image 1	Image 2	Image 3
551911	21.02432	105.8415	8/19/2018 19:54	44997	3	3	3	3	3	3	3	3	2	4.9	015346832581.jpg		
551572	21.02403	105.8417	8/17/2018 20:35	45675	2	3	3	3	3	2	2	3	2	4.7	015345129351.jpg		
571120	21.02191	105.8498	8/20/2018 19:27	17333	2	2	2	1	0	3	2	3	2	4.3	192755-10855.jpg		
551912	21.0245	105.841	8/19/2018 20:00	42188	3	2	2	2	1	3	3	1	2	4.4	115346836491.png		
551577	21.0241	105.842	8/17/2018 20:37	45639	3	2	3	3	3	2	2	3	2	4.7	115345130421.png	215345130421.png	
571506	21.02964	105.8414	8/25/2018 19:38	17333	2	2	3	2	0	3	2	2	2	4.4	193814-10916.jpg	193818-10916.jpg	
551913	21.02479	105.8414	8/19/2018 20:02	44997	2	2	2	2	3	3	3	1	2	4.5	015346837731.jpg		
551578	21.024	105.842	8/17/2018 20:37	45597	2	2	3	3	1	2	3	3	3	4.7	115345130721.png		
551581	21.0239	105.842	8/17/2018 20:39	45597	2	2	2	3	1	1	3	3	3	4.6	115345131541.png		
551914	21.0246	105.841	8/19/2018 20:02	42188	1	2	1	2	1	2	2	0	1	3.5	115346837831.png		
571509	21.02896	105.8416	8/25/2018 19:38	17333	3	3	3	1	1	3	2	3	2	4.6	193857-10916.jpg	193851-10916.jpg	
551582	21.02393	105.8416	8/17/2018 20:37	45648	3	3	3	3	3	2	1	3	3	4.8	015345131601.jpg		
570932	21.02647	105.8453	8/21/2018 21:59	17333	3	2	1	1	0	2	2	3	2	4.3	215915-10871.jpg	215903-10871.jpg	
551916	21.02374	105.8416	8/19/2018 20:07	44997	3	3	3	2	2	3	3	1	2	4.6	015346840321.jpg		
551583	21.02398	105.8416	8/17/2018 20:39	45647	1	1	2	2	2	2	2	3	2	4.3	015345131621.jpg		
570934	21.02609	105.8467	8/21/2018 22:00	17333	2	2	1	1	1	3	3	3	2	4.4	220007-10871.jpg	220010-10871.jpg	
551917	21.0237	105.842	8/19/2018 20:07	42188	2	2	1	2	1	3	3	1	2	4.3	115346840601.png	215346840601.png	
571512	21.02805	105.8416	8/25/2018 19:39	17333	3	2	3	1	1	3	2	3	2	4.5	193943-10916.jpg	212424-10878.jpg	
551584	21.024	105.841	8/17/2018 20:39	45639	3	2	2	3	3	2	2	3	2	4.6	115345131711.png	215345131711.png	315345131711.png
551918	21.02401	105.8416	8/19/2018 20:09	44997	2	2	3	2	2	3	3	1	2	4.5	015346841841.jpg		
571515	21.02716	105.8415	8/22/2018 21:24	17333	3	2	3	2	1	3	2	2	2	4.5	212450-10878.jpg	200554-10892.jpg	
551585	21.02401	105.8416	8/17/2018 20:39	45647	2	3	3	3	3	2	3	3	3	4.9	015345131931.jpg		
570936	21.02663	105.8476	8/21/2018 22:00	17333	2	2	2	1	1	2	3	3	2	4.4	220046-10871.jpg	220050-10871.jpg	
551919	21.0239	105.842	8/19/2018 20:09	42188	1	3	1	3	0	3	2	1	2	4.3	115346842041.png	215346842041.png	
571518	21.02635	105.8415	8/23/2018 20:06	17333	3	2	3	1	3	3	2	3	3	4.8	200608-10892.jpg	212510-10878.jpg	
551587	21.024	105.8415	8/17/2018 20:40	45647	3	3	2	2	2	2	2	3	3	4.7	015345132241.jpg		
551920	21.0246	105.841	8/19/2018 19:33	45001	3	3	3	3	2	2	3	3	3	4.9	115346881521.png		
571520	21.02553	105.8415	8/23/2018 20:06	17333	3	2	3	1	3	3	3	3	3	4.8	200624-10892.jpg	200628-10892.jpg	
551588	21.02377	105.8415	8/17/2018 20:40	45777	3	2	3	2	1	2	3	2	2	4.5	015345132371.jpg	115345132371.jpg	215345132371.jpg
571522	21.02453	105.8414	8/23/2018 20:06	17333	3	2	3	2	1	3	2	2	2	4.5	200640-10892.jpg	200648-10892.jpg	
551589	21.02392	105.8415	8/17/2018 20:40	45647	2	2	2	2	3	2	3	3	2	4.6	015345132541.jpg		
570939	21.02742	105.8478	8/21/2018 22:01	17333	2	2	3	2	1	3	2	2	2	4.4	220108-10871.jpg	220114-10871.jpg	
571524	21.02368	105.8415	8/23/2018 20:07	17333	3	2	3	2	1	3	3	3	3	4.8	200707-10892.jpg	200701-10892.jpg	
551590	21.0241	105.842	8/17/2018 20:41	45639	2	2	1	2	2	2	2	3	2	4.4	115345132711.png	215345132711.png	
571526	21.02275	105.8415	8/23/2018 20:07	17333	3	2	3	1	0	3	2	3	2	4.4	200725-10892.jpg		
551591	21.02393	105.8415	8/17/2018 20:41	45647	3	3	2	3	3	2	3	3	2	4.8	015345132861.jpg		
571528	21.02171	105.8415	8/23/2018 20:07	17333	3	2	3	2	0	3	3	2	2	4.5	200739-10892.jpg	200745-10892.jpg	
551592	21.0239	105.842	8/17/2018 20:41	45776	3	3	3	3	3	3	2	3	2	4.8	115345133041.png		
551593	21.02373	105.8416	8/17/2018 20:38	45648	3	3	3	3	3	2	2	3	2	4.8	015345133061.jpg		
570944	21.02672	105.8488	8/25/2018 19:57	17333	3	2	3	2	0	3	2	1	2	4.4	195702-10922.jpg	202019-10892.jpg	
551595	21.0241	105.842	8/17/2018 20:42	45639	2	2	2	3	3	2	2	3	2	4.6	115345133711.png	215345133711.png	315345133711.png
551596	21.0236	105.8416	8/17/2018 20:39	45648	3	3	3	3	2	2	2	3	2	4.7	015345134051.jpg		
551597	21.0239	105.842	8/17/2018 20:44	45776	3	3	3	3	3	3	2	3	2	4.8	115345134551.png		
571544	21.02064	105.8447	8/23/2018 20:10	17333	3	2	1	2	0	2	2	2	2	4.3	201039-10892.jpg		

Top Five Recommendations for Gender Inclusive Streets

Safe, Accessible and Comfortable Walkways must include:



1. **Street Lights** which uniformly lights up the streets without leaving any dark patches so that the entire surrounding is clearly visible. Street light pole's height, spacing and lux levels to be considered while designing and installing lighting.



2. **Sidewalks and Medians** proper kerb cuts or kerb drops, tactile tiles, guide rails and bollards to be designed and installed which improves accessibility and mobility for all. Routes must be kept clear of any disruption and encroachments to increase usability.



3. **Informal shopping/eating** to be encouraged to enable people engage in street activity hence making it safer by increasing participation in public places. Such activities attract different groups of people to spend more time on streets and therefore add more "eyes on the streets" to make it safer and inclusive.



4. **Public Amenities** at every metro station must include Bus Shelters for last mile connectivity, Public Toilets especially for the convenience of women and other vulnerable groups and Police Assistance Booths to strengthen the overall sense of security and to reduce response time for distressed pedestrians.



5. **At Grade Pedestrian Crossings** to allow all users to easily and safely cross the streets. Foot-over bridges and underpasses include hardships to climb up/down and increases vulnerability for women and others who may have children accompanying them and/or many belongings to carry.