WALKABILITY

Walkability Safety Assessment

Kigali, Rwanda

June 2024

WALK21

LEADING
THE WALKING
MOVEMENT

UNIVERSITY of RWANDA

TRANS SAFE

TRANSFORMING ROAD SAFETY IN AFRICA

Authors

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Reference

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Acknowledgments

The team are grateful to the European Commission for their support funding this study through the Horizon programme and to all the partners in the Trans-safe project who are sharing their expertise and knowledge to help deliver better road safety outcomes across Africa.

Walk21 wishes to acknowledge the dedication of the University of Rwanda and in particular Associate Professor Kayihura Muganga Didas, the Vice Chancellor; Dr. Ignace Gatare, the Principal of the College of Science and Technology; Dr Alphonse Nkurunziza, Senior Lecturer at the School of Engineering; and Moise Bitangaza, Assistant Lecturer in Civil & Transportation Engineering at the Department of Civil, Environmental and Geomatic Engineering, School of Engineering. Their support and leadership of the local team has kept the project practical and ensure the results are compelling for inspiring responsive action.

The project has proven that using simple, available tools, walking can be made safer, easier and more enjoyable relatively quickly to potentially benefit the millions of people walking in Africa every day.

Going forward it is acknowledged that the safety benefits for pedestrians in Rwanda, have the potential to be realised quickly thanks to the support of the Kigali Mayor, Mr. Dusengiyumva Samuel and Mr Dusabimana Fulgence, the Vice Mayor in Charge of Urbanisation and Infrastructure of Kigali city.

Table of contents

List of tables

List of figures

About Trans-Safe

The TRANS-SAFE (Transforming road safety in Africa) project involves national, regional, and city-level demonstrations to test different types of innovative and integrated approaches to sustainable road safety solutions, complemented by a comprehensive toolbox, capacity development, policy support and replication activities. To maximize impact, the project brings together a consortium of highly committed cities (Lusaka, Zambia; Cape Town, South Africa; Kigali, Rwanda; Kumasi, Ghana), road safety agencies and experts from both Europe and Africa.

Road safety systems and interventions from this project deliver on the recommendations of the Road Safety Cluster of the African-EU Transport Task Force, adopted in 2020. The project will help deliver on the Joint EU-Africa Strategy (JAES) and advance countries' progress towards the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs).

The vision of TRANS-SAFE includes five main aims:

Inform: Enhance knowledge of road crashes' causes and risk factors among relevant stakeholders and improve their capabilities to practically use tools to plan, assess, implement and operate road safety solutions.

Inspire: Promote the integration of the Safe System approach into local, regional and national road safety strategies by providing the needed guidance on data, methodologies and best practices.

Initiate: Strengthen road safety assessment and management systems by guiding relevant stakeholders in partner cities and countries to adopt internationally established system standards.

Implement: Create reference models for road safety innovations with a high level of replicability by implementing demonstration actions to test innovative, safe system technologies and services.

Impact: Contribute to regional and global sustainable road safety goals by evaluating the project`s demonstration actions and deriving implementable recommendations that can be integrated into policy, funding, operation, research and business practice.

About University of Rwanda

The University of Rwanda (UR) is a public Higher Learning Institution organized under a collegiate model with 6 Colleges. UR provides opportunities for students to pursue a variety of programs, some that are quite specialized in nature, others that are multi-disciplinary and problem-based in focus. The colleges undertake their studies at different locations across the country, both through classes at designated campuses and through access to distance learning.

About Walk21 Foundation

Walk21 Foundation is a charity registered in the United Kingdom that works internationally to support everyone's right to walk in a safe, inclusive, and welcoming environment by providing evidence, tools,

training and accreditation to a global network of concerned communities, politicians, academics and practitioners.

Walk21 helps make cities more walkable to increase access to basic services; enhance road safety and public health; improve gender equality; and ensure accessible, equitable, sustainable transport systems.

The key work streams of Walk21 includes:

Advocacy: representing the voice of pedestrians at key global forums to support the delivery of the sustainable development goals and Paris climate agreement target.

Knowledge: supporting governments with the development of effective policies and projects that impact positively on the safety, accessibility and comfort of people walking.

Network: Coordinating a global community of politicians, academics, advocates, engineers, planners, health professionals, architects, artists, and sociologists to advance the agenda for walking and liveable communities globally.

Executive Summary

As part of the Trans Safe project, Walk21 and University of Rwanda conducted a walkability study in Kigali, Rwanda, in June 2024. The main aim of the project was to better understand pedestrian experiences in Kigali and see how some elements and characteristics of the public space (environmental determinants) influenced such experiences, both in a positive and negative way. This information can greatly assist policy making to prioritise interventions that create safer walking environments.

At the beginning of the project, Walk21 delivered a two-hour online training session to the university students at the Engineering School on the use of the Walkability App as a survey tool to conduct walking interviews in Kigali. With the use of the Walkability App, seven trained surveyors interviewed 1,339 participants who shared 1,532 experiences related to 5,833 environmental determinants, between the 28th and 31st of May 2024. The data collection was distributed across fifteen different study areas in Kigali, focused on school catchments and car-free zones.

Participants were asked to share positive experiences, concerns and negative experiences while walking. Overall, the share of different experiences in all of Kigali was rather balanced, with over one-third of positive (37.7%), over one-third of concerns (37%) and one-quarter of negative experiences (25.3%). Although the most frequent type of experience was positive, the combination of concerns and negative experiences resulted in more than half of all experiences (62.3%). This shows that Kigali has some pedestrian-friendly areas related to positive pedestrian experiences that can be considered as good examples of how to cater for walking safety, accessibility and comfort. However, there are also other areas related to concerns and negative experiences that require attention and improvement, as they fail to cater for walking safety, accessibility and comfort.

Once participants shared their experiences, they were asked to identify the environmental determinants that influenced them, from some predefined categories included in the Walkability App. Overall, the five most relevant environmental determinants in Kigali related to positive experiences were 'Sufficient space and path quality' (9.4%), 'Clean and peaceful' (6.3%) and 'Lighting, seating or raps' (5.2%), 'Secure' (4.9%) and 'Trees and visual interest' (4.6%). However, the most common determinants related to concerns and negative experiences were 'Unsafe crossing` (9.6%), `Poor protection from weather' (7.7%), 'Insufficient space and poor path quality' (7.7%), 'Insufficient trees or visual interest' (5.6%) and finally 'Speed of traffic' and 'No pavement' (4.9% each).

The project focused on two different types of study areas. On the one hand, data was collected at primary and secondary school, including the University Campus, with a total of 12 educational centres. On the other hand, data was collected at three car-free zones and surrounded areas. The share of different pedestrian experiences varied considerably amongst study areas, showing a relevant variability in walkability across Kigali. Regarding schools, six study areas presented more positive experiences and can be considered places with good walkability (Camp Kigali School, Muhima Primary School, Kicukiro Primary School, FAWE Girls School, Saint Dominic Primary School, and University of Rwanda), whereas four study areas presented more concerns (Ntwali Primary School, St Joseph Le Travailleur Secondary School, Glory Secondary School, and Remera Gisimenti Car Free Zone), and three study areas presented more negative experiences (Groupe Scholaire EPA- St Michel, Biryogo Primary School, and Kabusunzu Primary School), which can be considered areas with poor walkability.

These would be the schools requiring more attention and improvement, specially related to insufficient path space or quality, unsafe crossings and driver behaviour.

In the case of the car-free zones, two of them presented more positive experiences (KN 4 Avenue and Biryogo Car Free Food Street) with over 50% of all experiences being positive and only around 10% of negative experiences. The few concerns and negative experiences were mainly related to lack of greenery, shade, lighting or seating. However, one car-free zone presented more concerns (Remera Gisimenti Car Free Zone) and some negative experiences related to traffic and lack of pedestrian infrastructure in the surrounding areas. This highlights that although car-free zones represent ideal environments for pedestrians, they should not be isolated areas and need safe and comfortable surroundings areas to access them. While Remera Gisimenti Car Free zone (KG 18 Ave) caters for pedestrian safety and comfort, the surroundings (KG 11 Ave and KN 5 Rd) require more attention.

The most relevant environmental determinants related to different experiences also varied amongst study areas. This highlights the need to conduct specific walkability interventions in each study area. As an example, participants praised different elements and characteristics of each study area as the most relevant for positive experiences, mainly 'Sufficient space' (Camp Kigali, Ntwali, Kabusunzu, Muhima and Kicukiro) or 'Clean and peaceful' (St Michel Nyarugenge, St. Joseph Le Travailleur and Biryogo,). However, other areas were mainly perceived as positive for other main reasons, such as 'Trees and visual interest' (Glory, Saint Dominic), 'Personal security' (University of Rwanda and Remera Gisimenti), street design and the path (FAWE and KN 4 Ave) or 'Lighting, seating or ramps' (Biryogo car free). This means that different areas present certain degrees of walkability quality in some specific elements that can be promoted and applied in others. Similarly, the areas with more concerns and negative experiences do not always present the same issues. While a considerable number of study areas need to improve 'Unsafe crossings' (Ntwali, St. Joseph Le Travailleur, Muhima, Glory and FAWE), other also need to pay attention to 'Poor protection from weather' (Camp Kigali, Biryogo and Kicukiro) or 'Insufficient path space or quality' (Kabusunzu and St Michel Nyarugenge) to improve their walkability.

Finally, participants were asked to share their age, gender and ability to walk and interact with the environment. This provided relevant insights on how different pedestrians might have different experiences of the same place based on their specific needs and concerns. By gender, the study did not show any relevant differences on walking experiences between men and women related to all the determinants considered. In the case of pedestrian age, teenagers and adults shared more positive experiences than the rest, while older people tended to share more negative experiences, specially related to pedestrian crossings, protection from weather and absence of footpath. Finally, in the case of pedestrian ability, able pedestrians considerably shared more positive and fewer negative experiences than the rest, while impaired pedestrians shared many more negative experiences, up to 50% of all their experiences, specially related to footpath quality, pedestrian crossings, protection from weather, absence of footpath, traffic speed and driver behaviour.

As a recommendation, all data collected in the project were georeferenced and mapped across Kigali to identity clusters of positive and negative experiences, while locating the most relevant environmental determinants that influenced such experiences. This can greatly assist Kigali City to learn about the areas that were related to positive experiences and consider them as best practices

to extend and implement in other places. The study also identified areas related to concerns and negative experiences that can be prioritised for future interventions. The results of this study can also guide the type interventions that are needed to improve these areas. Some places with negative experiences were related to traffic safety issues, such as ´traffic speed´, ´driver behaviour´ and 'unsafe crossing', while others were related to poor pedestrian infrastructure and equipment, such as ´insufficient space or poor path quality', 'poor drainage and protection from weather' and `no lighting, seating or ramps'.

Key recommendations

1. THE APP IS ACCESSIBLE AND QUICK TO USE: The Walkability App is being proved to be an suitable tool, which local surveyors can be easily trained to use and apply in walkability assessments, by conducting walking interviews and surveys in a quick and affordable way. It took 2 hours to train the team online and they were then able to engage over 1,000 people in one week.

- UR should consider using the app in a systematic way in more places across the city to establish a base map of the pedestrian experience.
- Walk21 should consider making the tool accessible off-line to keep the impact on mobile data minimal and add a photo function so that the detail of the pedestrian experiences can be captured visually too.
- Other Universities in Africa and globally should consider using the walkability app as an affordable and practical way to capture and visualise the needs of people in public space.

2. ROAD SAFETY IS NOT AFFECTING EVERYONE EQUALLY: Children, the elderly and people with disabilities clearly perceive more risk and problems. Especially when dealing with traffic speed, driver behaviour and road crossings. In response, we need to ensure drivers are more considerate and respectful; street designs give priority to pedestrians everywhere; and crossings are designed with longer crossing times and shorter wait times etc.

- UR should develop a list of specific actions that can be taken to address the local concerns that have been mapped and shared. Campaigns need to target driver behaviour as well as improve infrastructure and ensure the needs of children, the elderly and people with disabilities are included as a priority.
- Walk21 should consider further studies that target the needs of children, the elderly and people with disabilities. If necessary, taking these people to areas where they may not currently feel able to walk and recording what changes are urgently required to ensure they are included.
- Other Trans-safe partners should consider how to promote the approach showcased in this project as a model that could be adopted by others to help rapidly transform better road safety outcomes across Africa.

3. THERE IS GOOD AND BAD EVERYWHERE: Kigali has areas with safe and unsafe crossings. Overall appropriate traffic speed, but also places where traffic speed and driver behaviour are perceived as a problem. The data lets us pinpoint where new solutions are needed most. The important part is knowing where the difference is and where to target resources in response. As an indicative key information to prioritise interventions, the following table presents all study areas ordered from more

negative walking experiences to more positive ones, and includes the three most frequent characteristics related to concerns or negative experiences (to tackle and improve) and the three most frequent characteristics related to positive experiences (to increase or extend it to other areas).

Study Areas	Experiences (%)			3 Main Strengths	3 Main Challenges
	Positive	Concern	Negative		
Kabusunzu Primary School	13.0	31.0	56.0	- Sufficient space - Supported & directed - Secure	- Poor path quality - Unsafe crossing - No protection from weather
Groupe Scholaire EPA- St Michel	37.1	21.6	41.4	- Clean & peaceful - Secure - Trees & visual interest	- No footpath - Unsafe crossing - Poor path quality
Biryogo Primary School	28.9	33.3	37.8	- Clean & peaceful - Lighting, seating or ramps - Path quality	- No protection from weather - Traffic speed - Designed for traffic
Glory Secondary School	22.3	50	27.7	- Trees & visual interest - Secure - Lighting, seating or ramps	- Unsafe crossing - No protection from weather - Poor path quality
St Joseph Le Travailleur Secondary School	14.9	47.1	37.9	- Clean & peaceful - Trees & visual interest - Lighting, seating or ramps	- Unsafe crossing - No protection from weather - Poor path quality
Remera Gisimenti Car Free Zone	36.9	45.6	17.5	- Secure - Clean & peaceful - Sufficient space	- No footpath - Unsafe crossing - No protection from weather
Ntwali Primary School	24.1	44.4	31.6	- Sufficient space - Path quality - Secure	- Unsafe crossing - No footpath - No protection from weather
KN 4 Avenue - Pedestrianised	64.6	23.2	12.2	- Designed for people - Clean & peaceful - Sufficient space	- No trees & visual interest - No protection from weather - No lighting, seating or ramps
Biryogo Car Free Food Street	57.8	32.5	9.6	- Lighting, seating or ramps - Clean & peaceful - Designed for people	- No trees & visual interest - Unsafe crossing - Poor path quality
University of Rwanda	50.4	37.0	12.6	- Secure - Clean & peaceful - Sufficient space	- Unsafe crossing - No footpath - No protection from weather
FAWE Girls School	46.9	39.9	13.3	- Presence of footpath - Trees & visual interest - Lighting, seating or ramps	- Unsafe crossing - Traffic speed - Dirty, noise or air pollution
Muhima Primary School	46.9	45.8	7.3	- Sufficient space - Path quality - Lighting, seating or ramps	- Driver behaviour - Unsafe crossing - Traffic speed
Saint Dominic Primary School	43.7	42.3	14.1	- Trees & visual interest - Lighting, seating or ramps - Clean & peaceful	- No lighting, seating or ramps - No protection from weather - Poor path quality
Kicukiro Primary School	43.2	22.7	34.1	- Sufficient space - Lighting, seating or ramps - Clean & peaceful	- No protection from weather - No trees & visual interest - Unsafe crossing
Camp Kigali School	39.5	35.5	25	- Sufficient space - Trees & visual interest - Clean & peaceful	- No protection from weather - Unsafe crossing - Poor path quality

Table 1. Walking experiences and relevant environmental determinants, by study areas.

- UR should share the findings of the report with Kigali City and other relevant authorities who have the responsibility for making lives safer, easier and more enjoyable to inspire actions on the ground that deliver better road safety outcomes as a priority.
- Walk21 should maintain the partnership with UR to ensure the database of experiences continues to grow and be updated, post interventions, to help evaluate the impact of the works.
- Other cities across Africa, should learn from the Kigali experience of using the app as a foundation to inspiring more targeted road safety improvements.

Conclusions and discussion

The Walkability App allowed to easily and affordably collect over 1,500 walking experiences linked to nearly 6,000 observations of public space were collected in Kigali and the city should be proud to have 38% positive reports and only 25% of reports as related to negative experiences.

With over 38% positive walking experiences, Kigali clearly knows how to create good footpaths, maintain them to be clean and ensure people feel secure. It is also interesting to see that traffic speed and driver behaviour is not as prominent a concern as we have seen in other cities in the local context. However, there were also walking reports and observations related to concerns and negative experiences.

The main improvements being asked for are safer road crossings, better footpaths and more protection from the weather, so the challenge is not what to do or how to do it, but to make sure school zones in particular are a priority for future works. Kabusunzu Primary, Groupe Scholaire EPA St Michel, and Ntwali Primary Schools look like the main priorities for follow up visits to audit the environments with engineers. Regarding car-free zones, they presented a much higher share of walking experiences, with some concerns related to lack of greenery or protection from weather. However, the surrounding of these car*free zones presented a considerable number of concerns and negative experiences, mainly related to traffic safety. This means that although the car-free zones provide an ideal environment for pedestrians, more effort is needed around these areas to enable safe and comfortable walking access to them.

Finally, more detailed analysis of the data might further help pinpoint specific places where targeted interventions could deliver a rapid and tangible benefit to the most urgently reported safety concerns of school children in the City.

1. Methodology and approach

1.1. Data collection tool: Walkability App

The tool proposed to conduct the walkability assessment is the Walkability App, developed by Walk21, which can be freely downloaded and used on any Android and iOS mobile device. This tool allows information to be collected using four main types of data, considered as key information for in-depth and pedestrian-centred walkability assessments. A brief description of each type of data is described below:

1. Pedestrian profile: Information on the participants in the assessment, including their age, gender, and ability.

2. Walk context: Information on the walks taken by participants, including walk purpose, choice, group size and familiarity with the place.

3. Pedestrian experience: Information on the pedestrian satisfaction with the experienced public space, also known as perceived walkability of the place. Participants can rate their perceived walkability by identifying "positive experiences", "concerns" and "negative experiences".

4. Environmental determinants: Information on the elements and characteristics of the public space that influence pedestrians' experiences. Participants can describe the public space by using a set of predefined categories on the Walkability App. There are 12 categories linked to positive experiences and 12 for negative experiences and concerns. The Walkability App also allows inclusion of open text to further describe elements and characteristics of the public space that might not be represented in the predefined categories.

Figure 1. Predefined environmental determinants from the Walkability App.

1.2. Data collection strategy

1.2.1. Trained surveyors for walking interviews

The fieldwork was conducted by seven trained surveyors and field researchers had the app installed on their mobile phones. Data collection was conducted through walking interviews by using the Walkability App as a survey tool. After a two-hour online training session, surveyors learnt how to engage with volunteered participants in the street and ask them about their pedestrian profile, walk context, walking experience and environmental determinants that influenced them. Surveyors also learnt how to translate the participants responses into the predefined variables, categories and text fields within the Walkability App to input all necessary data for the project. A step-by-step tutorial for the walking interviews can be found in *Appendix 2*.

Trained surveyors team: Blaise Rusagara, Elysee Akimana, Ephron Nshimyumuremyi, Eugene Nzabonimpa, Jean de Dieu Twizerimana, Pacifique Hagumimana, and Philippe Tugirumuremyi.

Coordinated and led by MSc Moise Bitangaza and Dr. Alphonse Nkurunziza.

1.2.2. Population sampling and other considerations

The study collected between 80 and 100 walking experiences by study area in other to compare results amongst them. It combined a volunteered response sampling with a purposive sampling method. On the one hand, the volunteered response sampling relied on people at the study areas who were willing to participate. On the other hand, surveyors conducted purposive sampling to gain knowledge about less frequent pedestrian profiles. In view of this, surveyors were encouraged to actively approach children and older participants, as well as people with reduced mobility, to include them in the sample as much as possible. They were also encouraged to evenly engage both women and men in the interviews. This approach aimed at better understand how the walkable environment is perceived by all types of participants, based on their specific needs and concerns. These sampling methods are often used in exploratory and qualitative research with the aim to develop an initial understanding of the population under study.

At the study areas related to educational centres, participants were asked to share their walking experiences at the exact location where they encountered the surveyors. However, at the car-free zones, participants were asked to share their walking experiences of the entire walk until they accessed the location where they were encountered by surveyors.

1.2.3. Time frame and location for data collection

Data collection was conducted for four days, between the 28th of May to the 31st of May in 2024, in 15 study areas across Kigali. The study areas included 12 primary and secondary schools, one area at the University Campus entrance, and three car-free zones.

1.2.4. Description of areas selected for the study

	Study area	Road	Type
1	Camp Kigali School	KN 2 Ave	Primary and Secondary Schools. University
2	Groupe Scholaire EPA- St Michel		
3	Ntwali Primary School		
4	St Joseph Le Travailleur Secondary School		
5	Biryogo Primary School	KN 123 St	
6	Kabusunzu Primary School	KN 20 Ave	
7	Muhima Primary School	KN 1 Rd	
8	Kicukiro Primary School	KK 42 Ave – KK 21 Ave	
9	Glory Secondary School	KG 10 Ave	
10	FAWE Girls School		
11	Saint Dominic Primary School		
12	University of Rwanda	KN 3 Ave – KN 67 Ave	
13	KN 4 Avenue – Pedestrianised (Centred)	KN 4 Ave	Car-free zones
14	Biryogo Car Free Food Street (Part of Biryogo School)	KN 126 St	
15	Remera Gisimenti Car Free Zone	KG 18 Ave	

Table 2. Study areas.

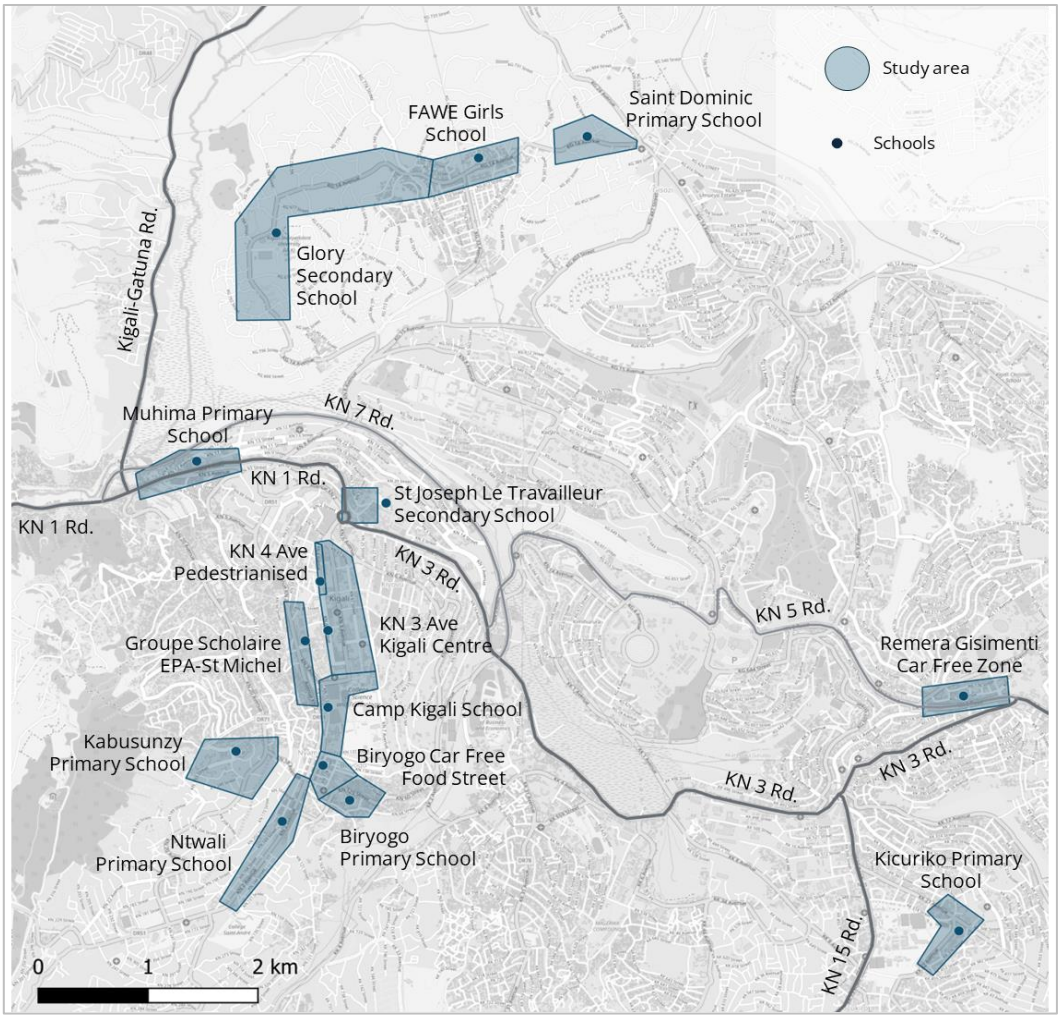


Figure 2. Map with all study areas.

1. Camp Kigali School

(-1.960227, 30.060769)

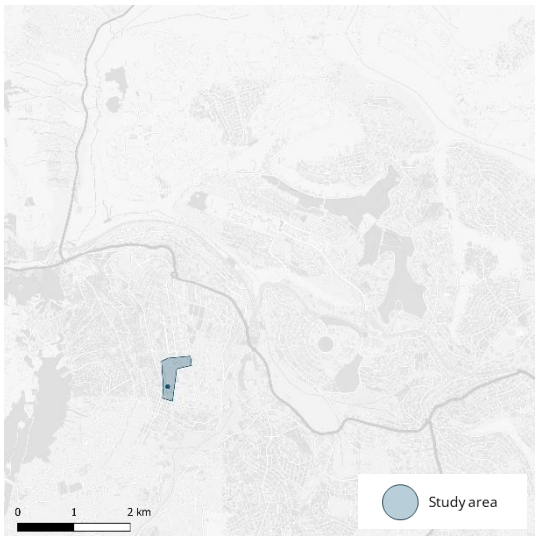


Figure 3. Camp Kigali School, location and observations.

2. Groupe Scholaire EPA- St Michel Nyarugenge

(-1.954475, 30.058718)

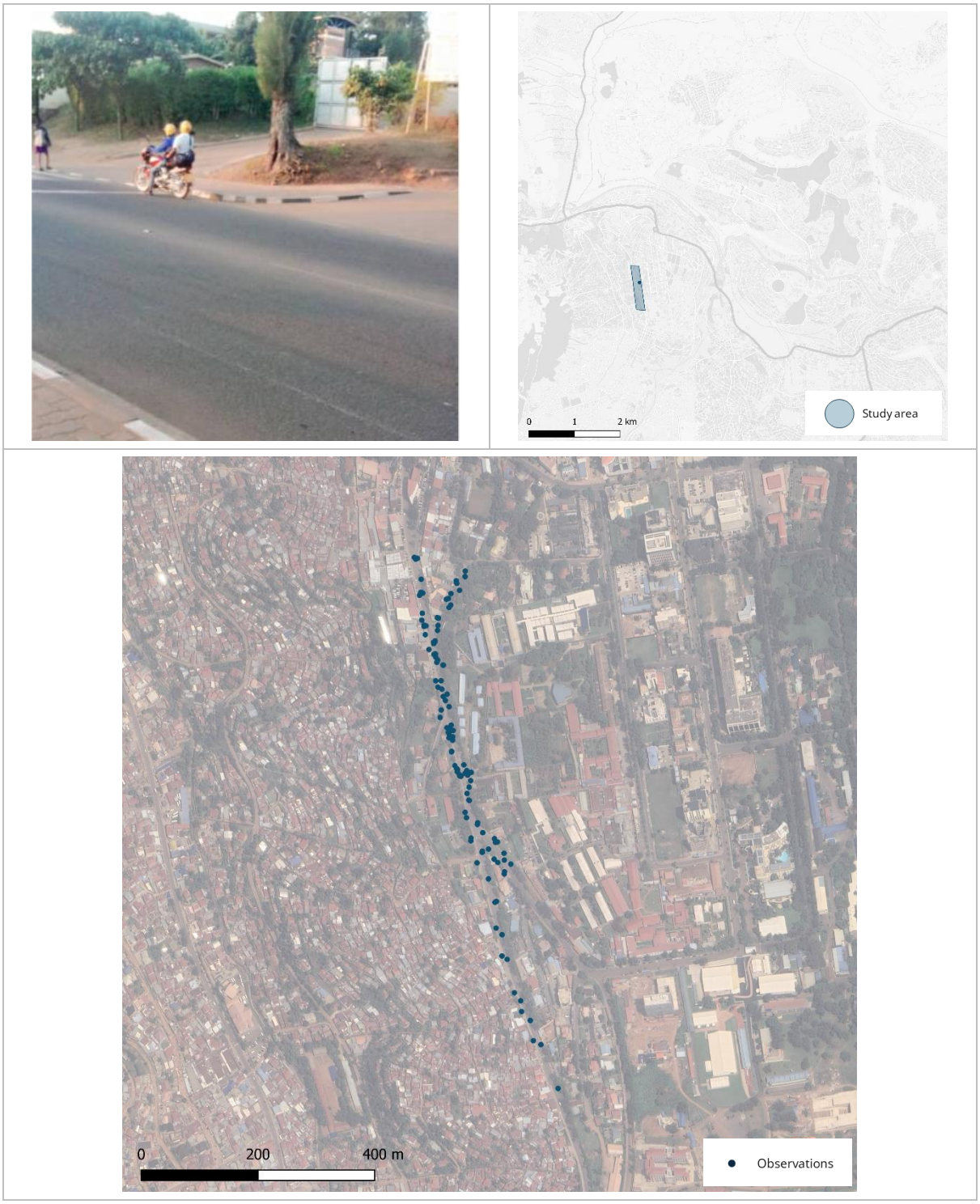


Figure 4. Groupe Scholaire EPA- St Michel Nyarugenge, location and observations.

3. Ntwali Primary School

(-1.968688, 30.0587349)

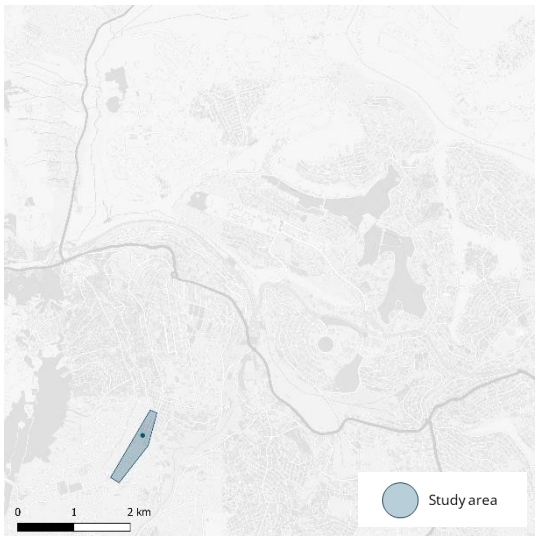
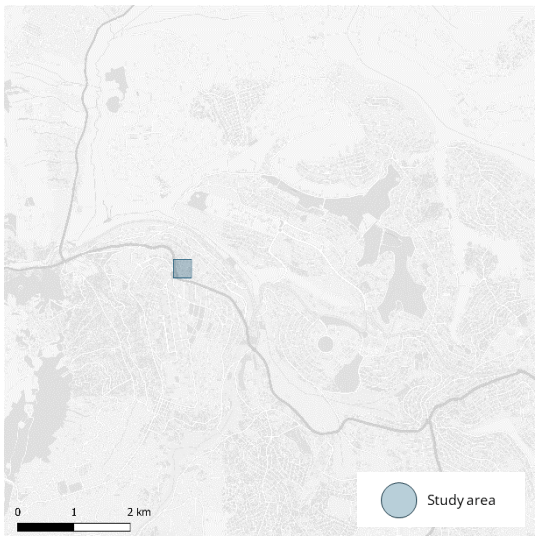


Figure 5. Ntwali Primary School, location and observations.

4. St. Joseph Le Travailleur Secondary School

(-1.942916, 30.065324)



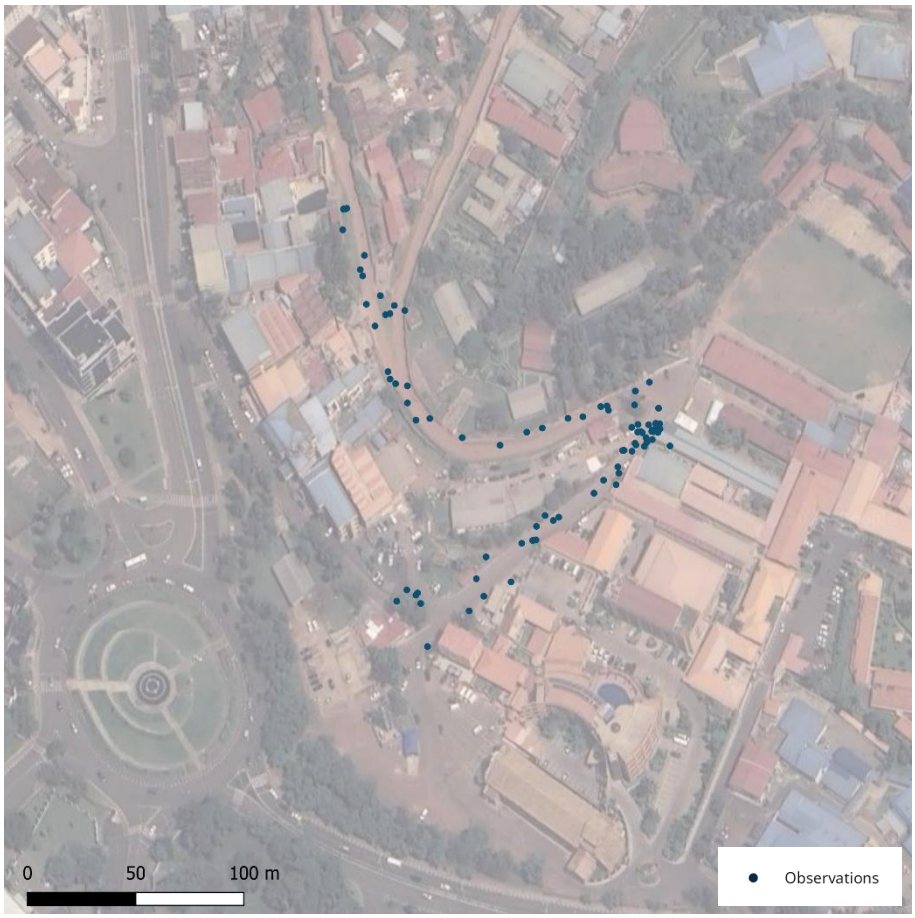


Figure 6. St. Joseph Le Travailleur Secondary School, location and observations.

5. Biryogo Primary School

(-1.967987, 30.0623998)

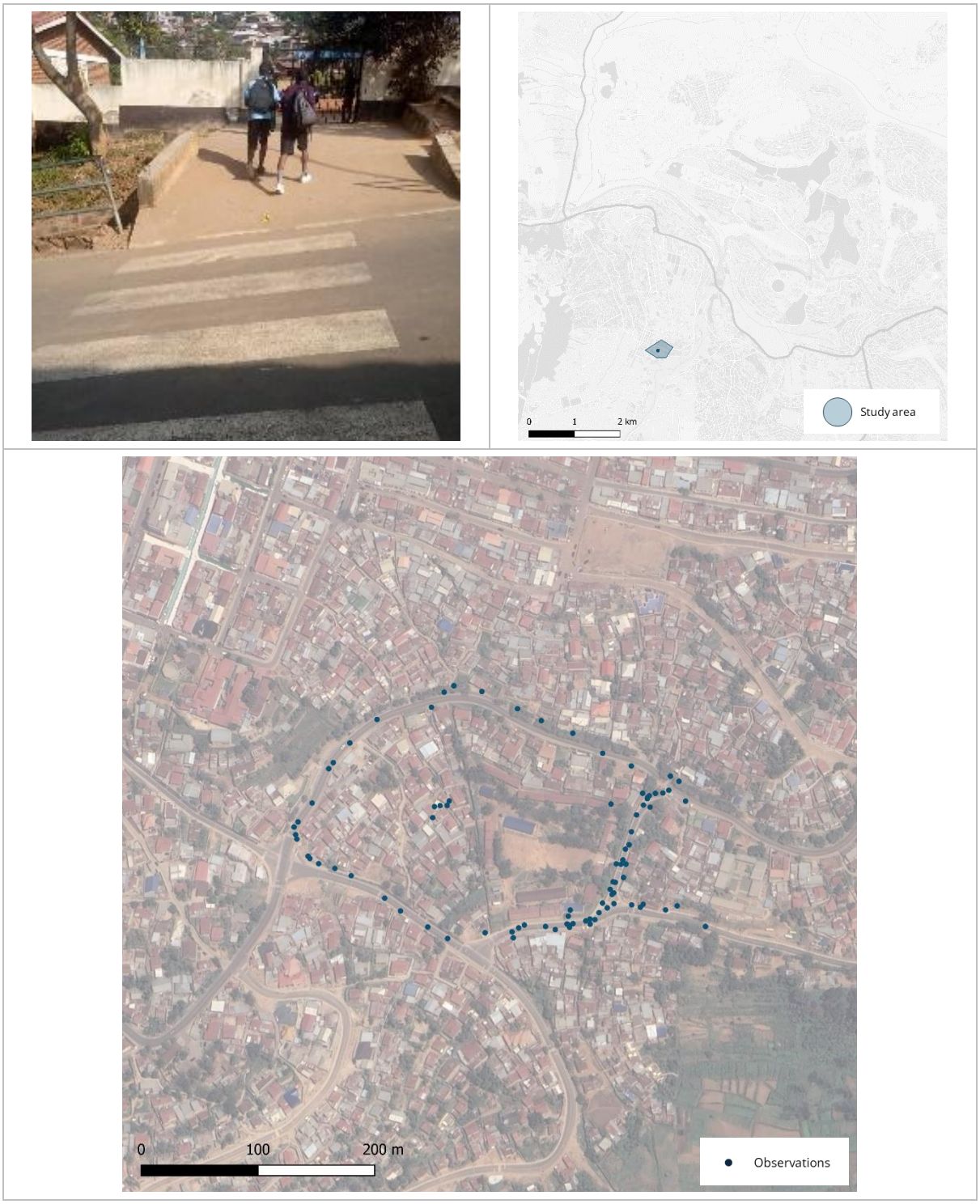


Figure 7. Biryogo Primary School, location and observations.

6. Kabusunzu Primary School

(-1.963565, 30.053822)

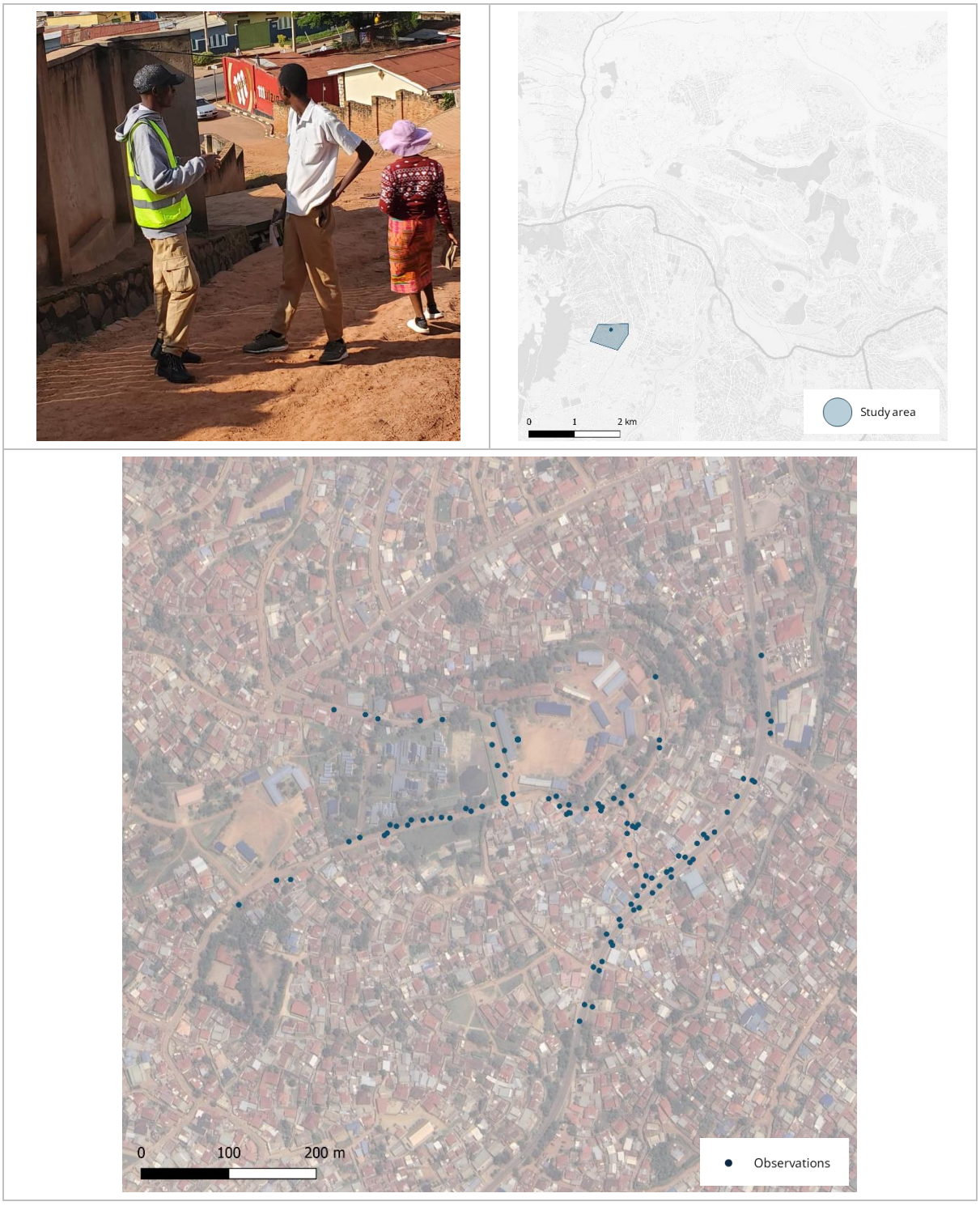


Figure 8. Kabusunzu Primary School, location and observations.

7. Muhima Primary School

(-1.944946, 30.052951)

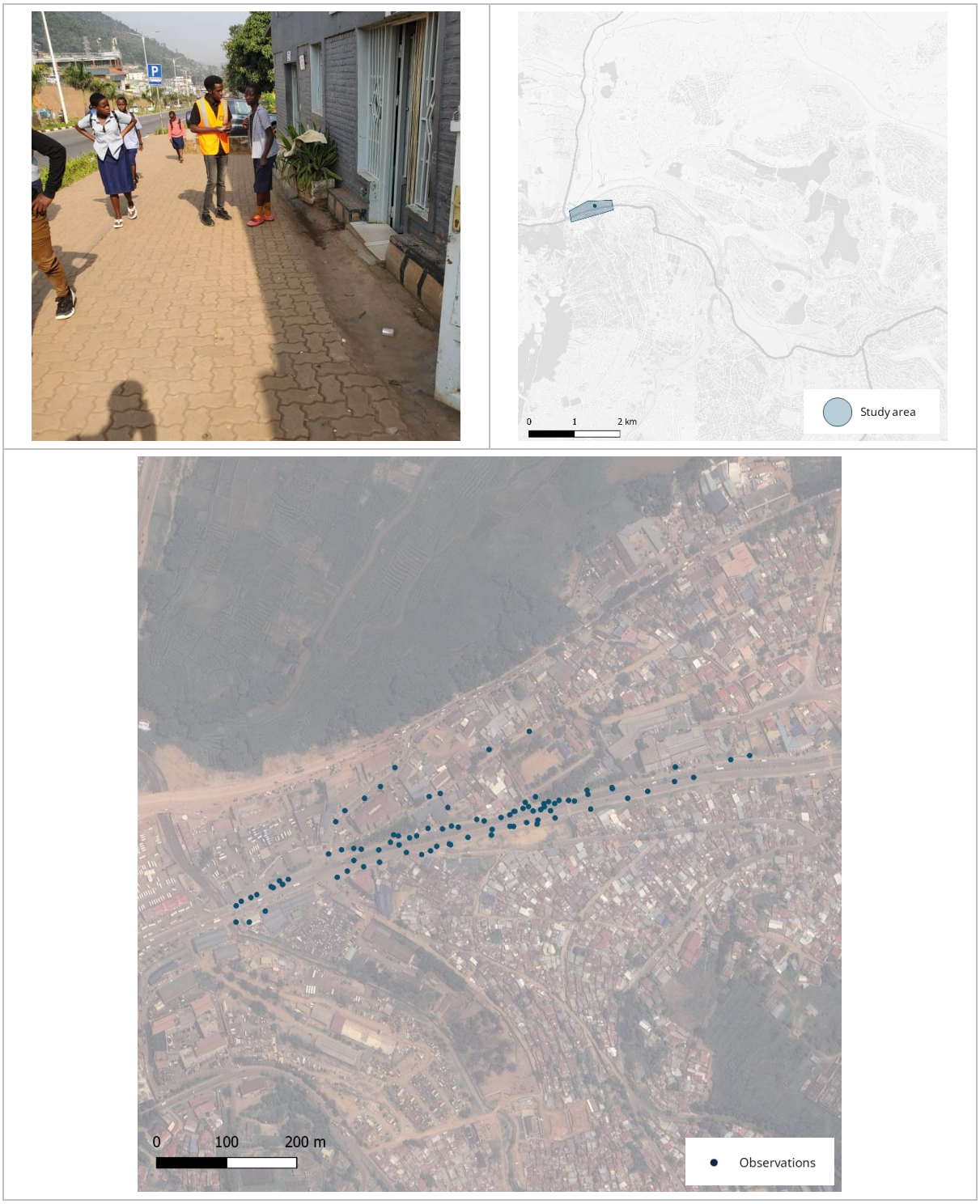


Figure 9. Muhima Primary School, location and observations.

8. Kicukiro Primary School

(-1.979105, 30.112186)

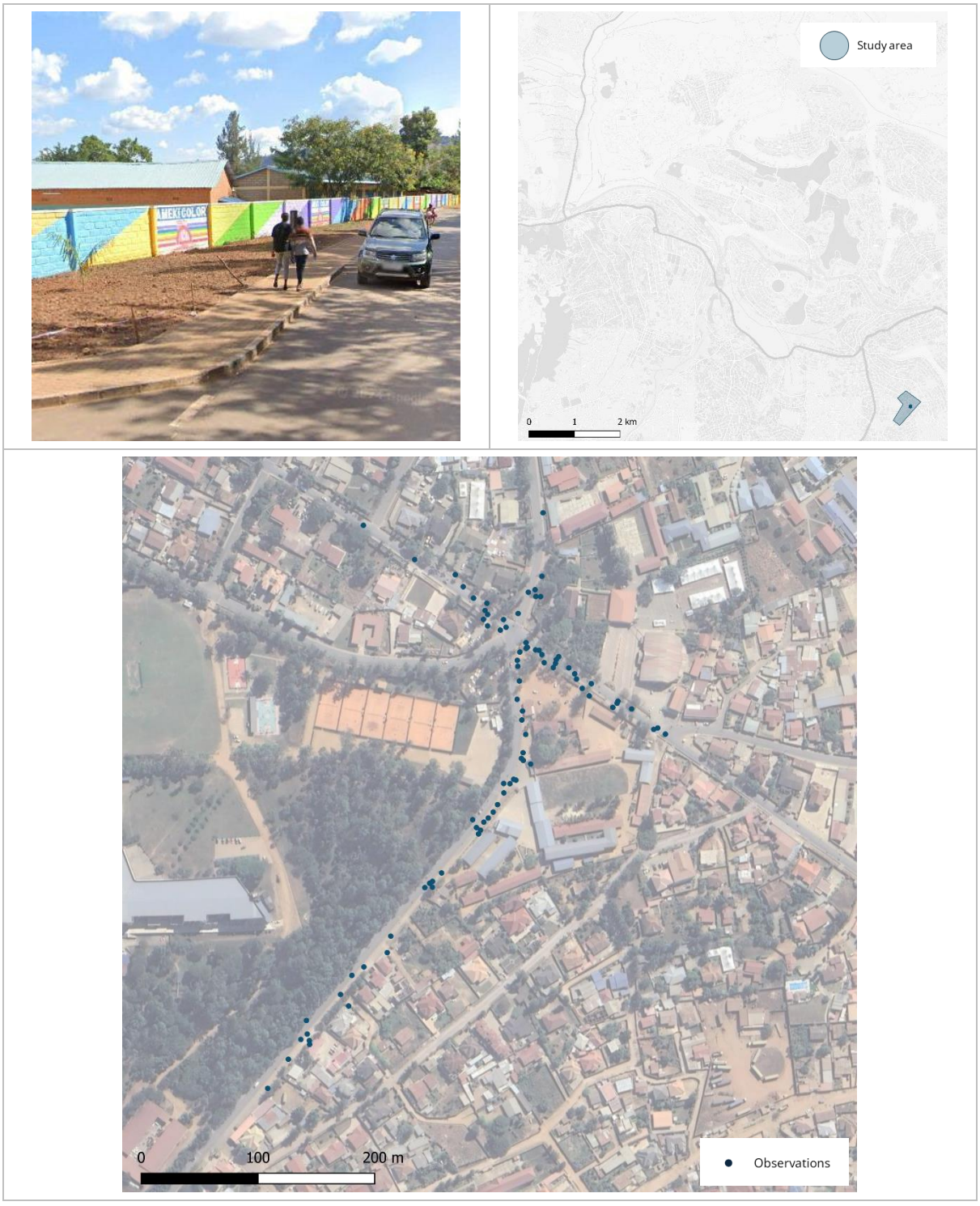


Figure 10. Kicukiro Primary School, location and observations.

9. Glory Secondary School

(-1.920163, 30.056059)

Figure 11. Glory Secondary School, location and observations.

10. FAWE Girls School

(-1.913738, 30.073040)

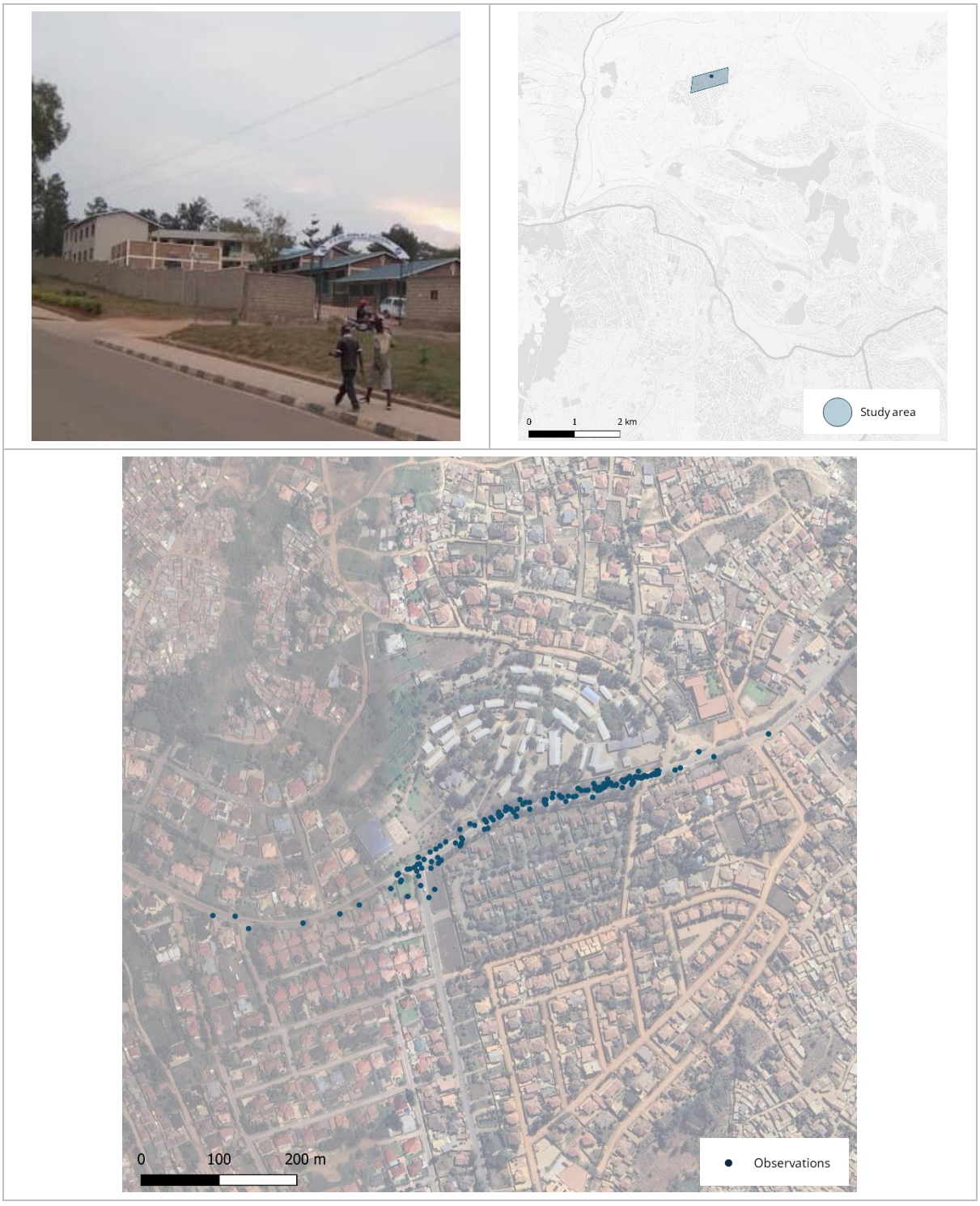


Figure 12. FAWE Girls School, location and observations.

11. Saint Dominic Primary School

(-1.912053, 30.081728)

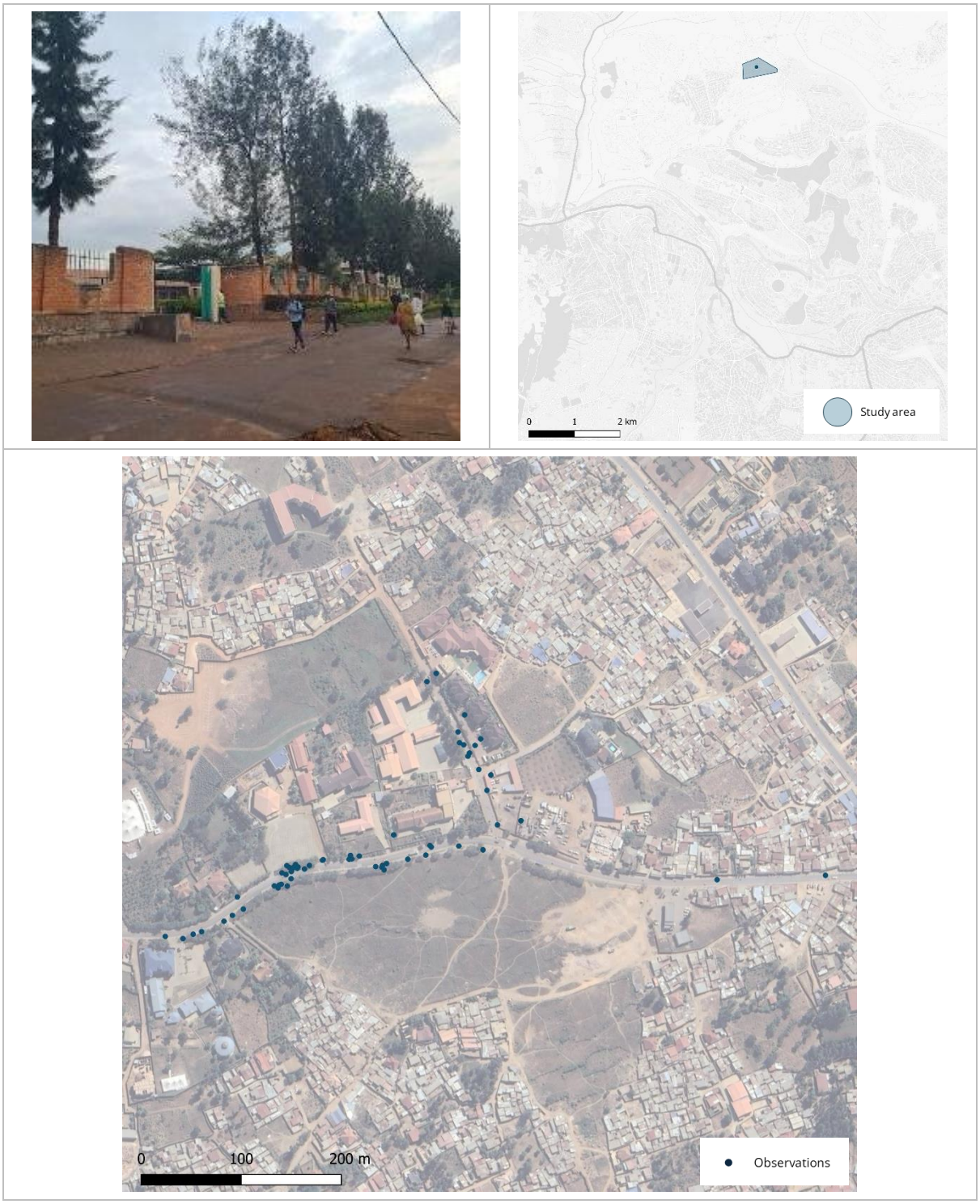


Figure 13. Saint Dominic Primary School, location and observations.

12. University of Rwanda

(-1.951881, 30.061544)

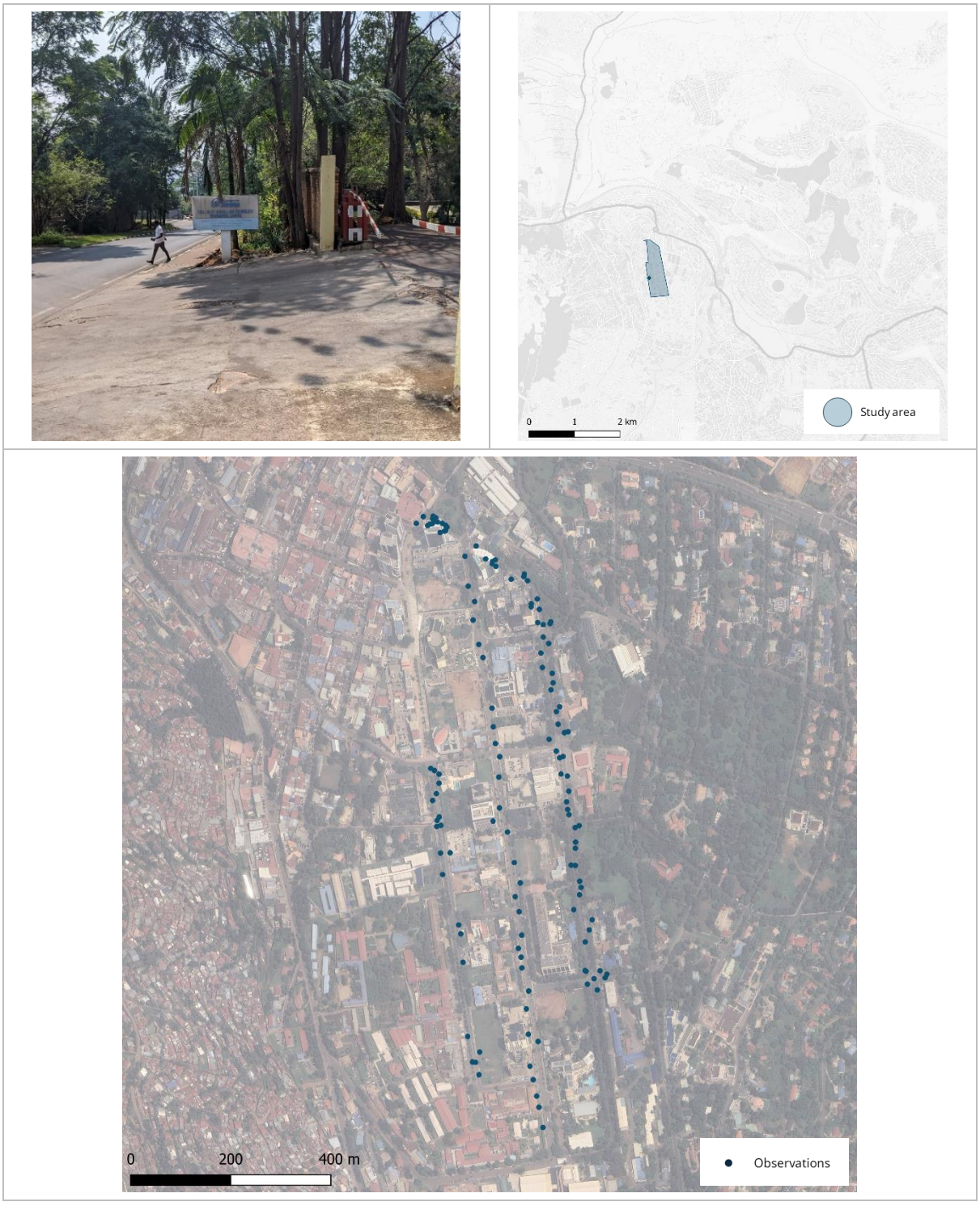


Figure 14. University of Rwanda, location and observations.

13. KN 4 Avenue – Pedestrianised area

(-1.948527, 30.059837)

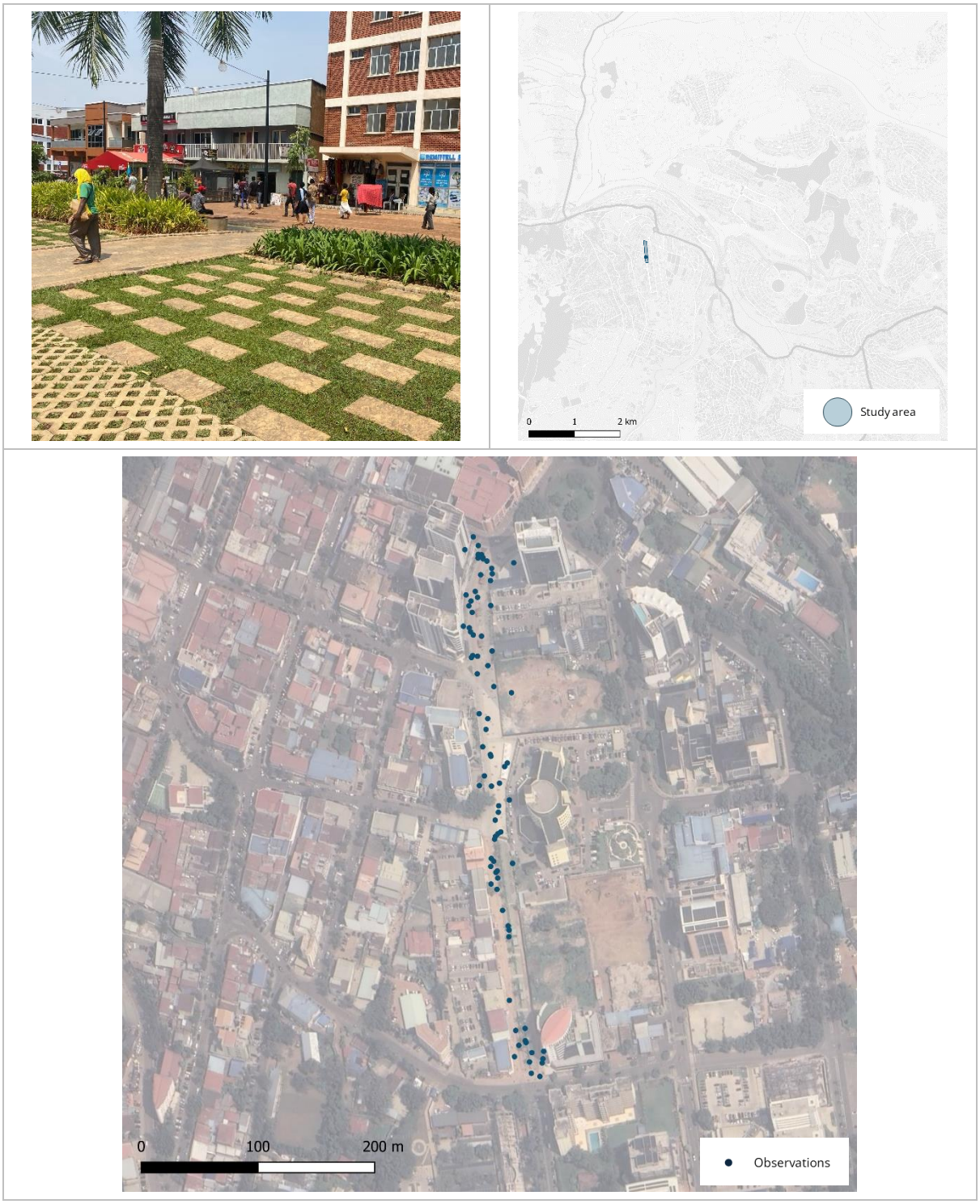


Figure 15. KN 4 Avenue – Pedestrianised area, location and observations.

14. Biryogo Car Free Food Street

(-1.964971, 30.0596549)

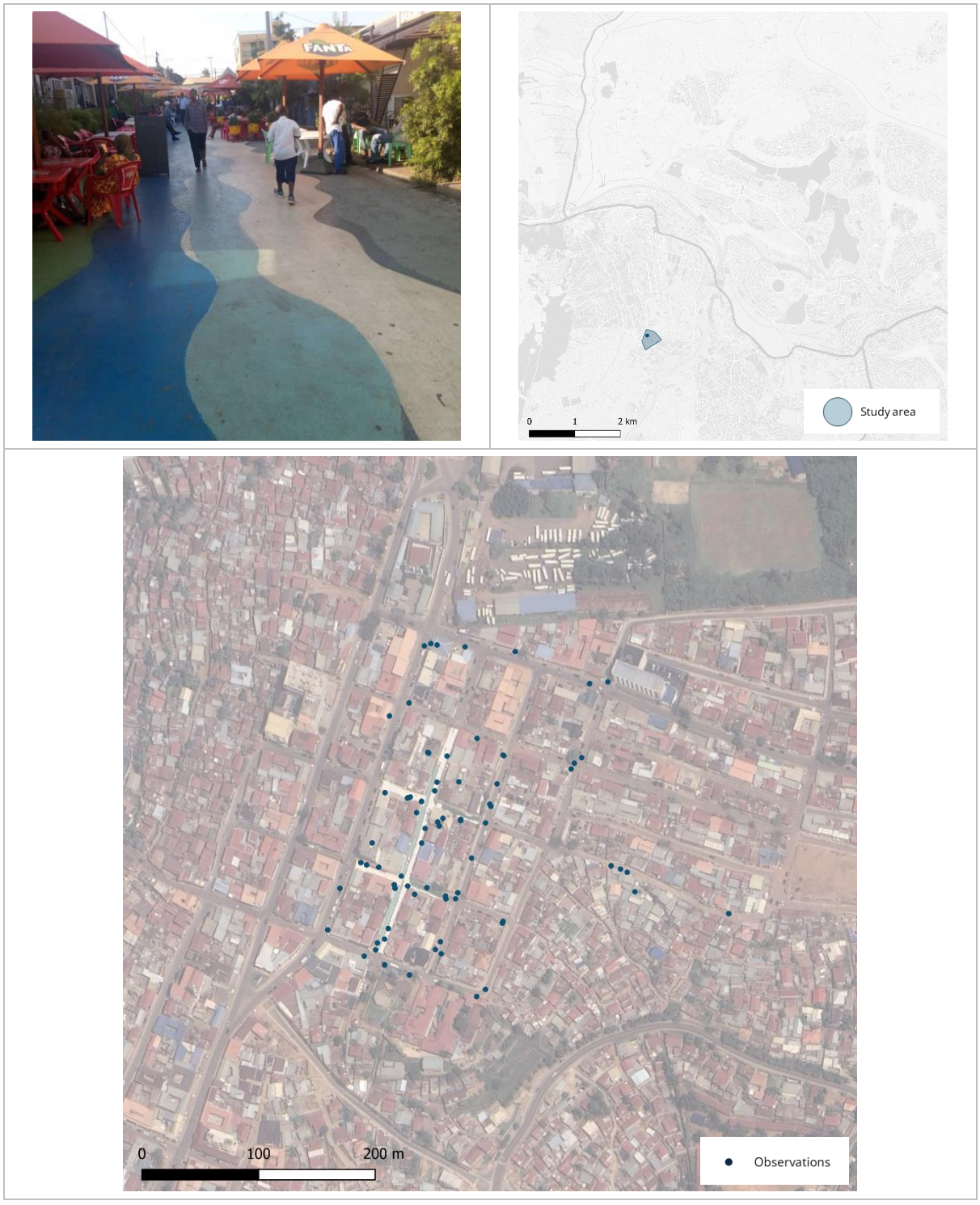


Figure 16. Biryogo Car Free Food Street, location and observations.

15. Remera Gisimenti Car Free Zone

(-1.959066, 30.1125592)

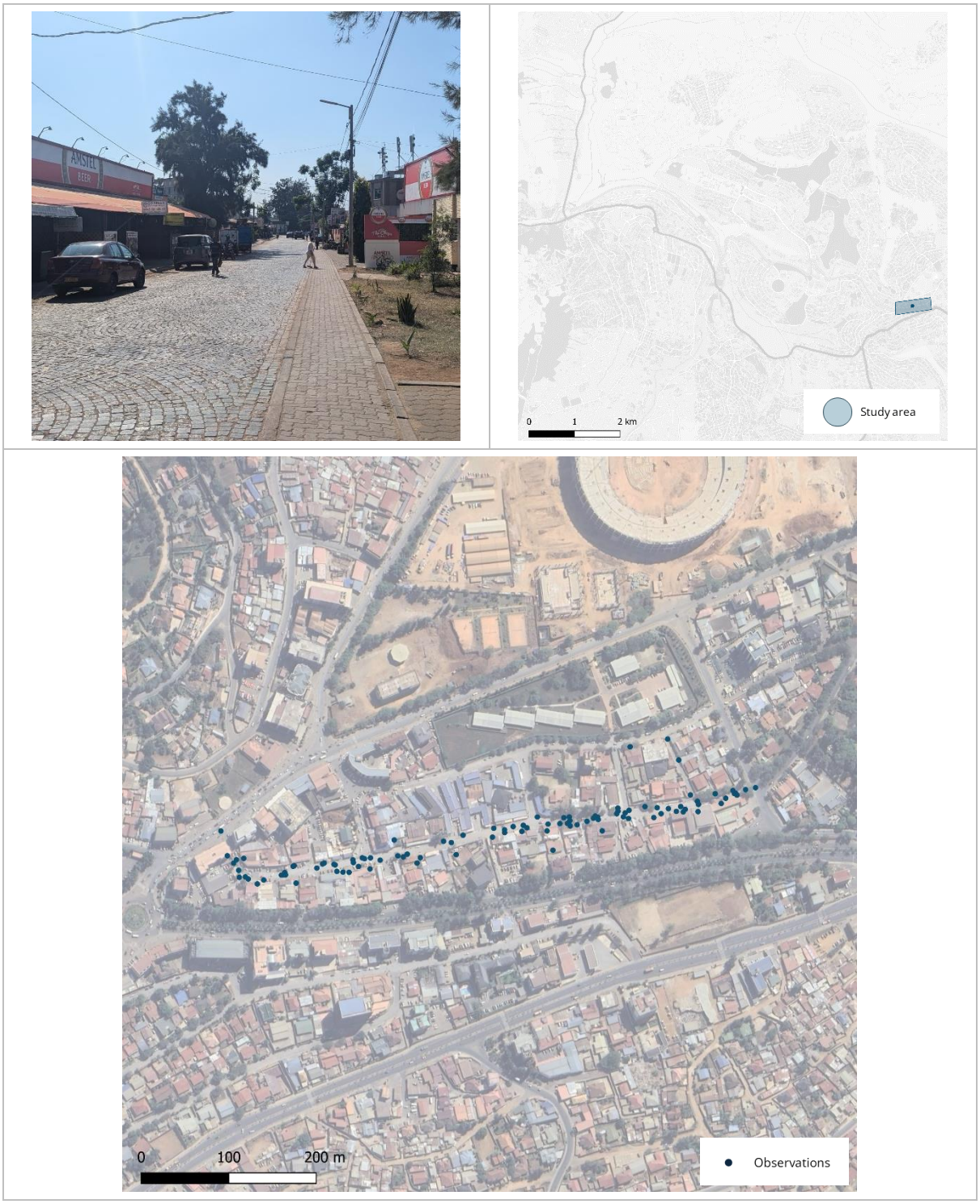


Figure 17. Remera Gisimenti Car Free Zone, location and observations.

2. Data analysis and findings

2.1. Summary of data collected

From the 28th of May to the 31st of May in 2024 (4 days), seven trained surveyors interviewed 1,339 participants in 15 study areas in Kigali. The 1,339 participants shared a total of 1,534 walking experiences, linked to a total of 5,833 environmental determinants (elements and characteristics of public space that influenced walking experiences).

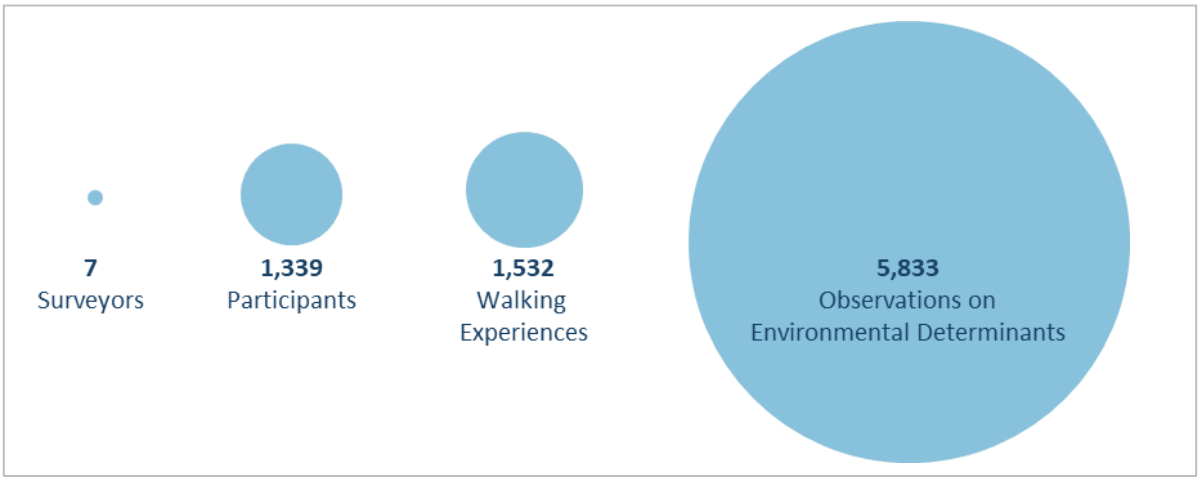


Figure 18. Summary of data collected.

2.2. Pedestrian profiles in Kigali

From the 1,339 participants engaged in the study, 720 were men (53.8%), 613 women (45.8%) and 6 did not specify their gender – no answer (0.4%). Regarding age, 96 were children (7.2%), 327 were teenagers (24.4%), 807 were adults (60.3%) and 109 were older people (8.1%). Regarding their ability to move and interact with the environment, 1,257 were able (93.9%), 40 were assisted (3%) and 42 were impaired (3.1%).

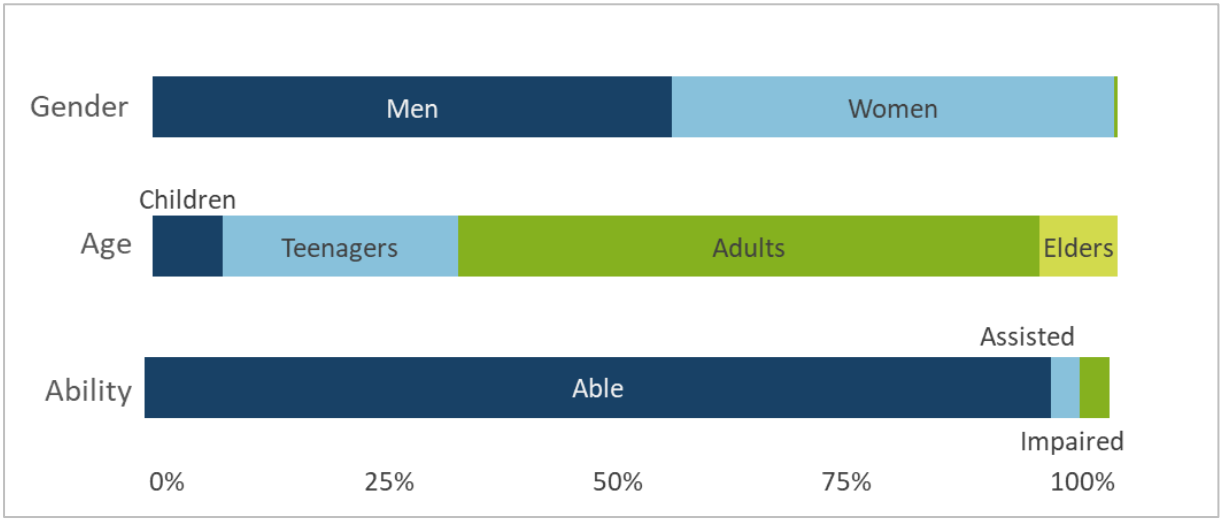


Figure 19. Pedestrian profile at all study areas in Kigali.

2.3. Walk context

From the 1,339 walks captured in the walking interviews, 945 pedestrians walked out of necessity (70.6%) and 394 out of choice (29.4%). Regarding the purpose of the walk, 1,180 were for transport (88.1%) and 159 as a leisure activity (11.9%). Regarding company, 898 pedestrians were alone (67.1%), 117 with a dependent (8.7%), and 324 in a group (24.2%). Finally, regarding the familiarity with the place, 1,148 pedestrians were by locals (85.7%) and 191 by visitors (14.3%).

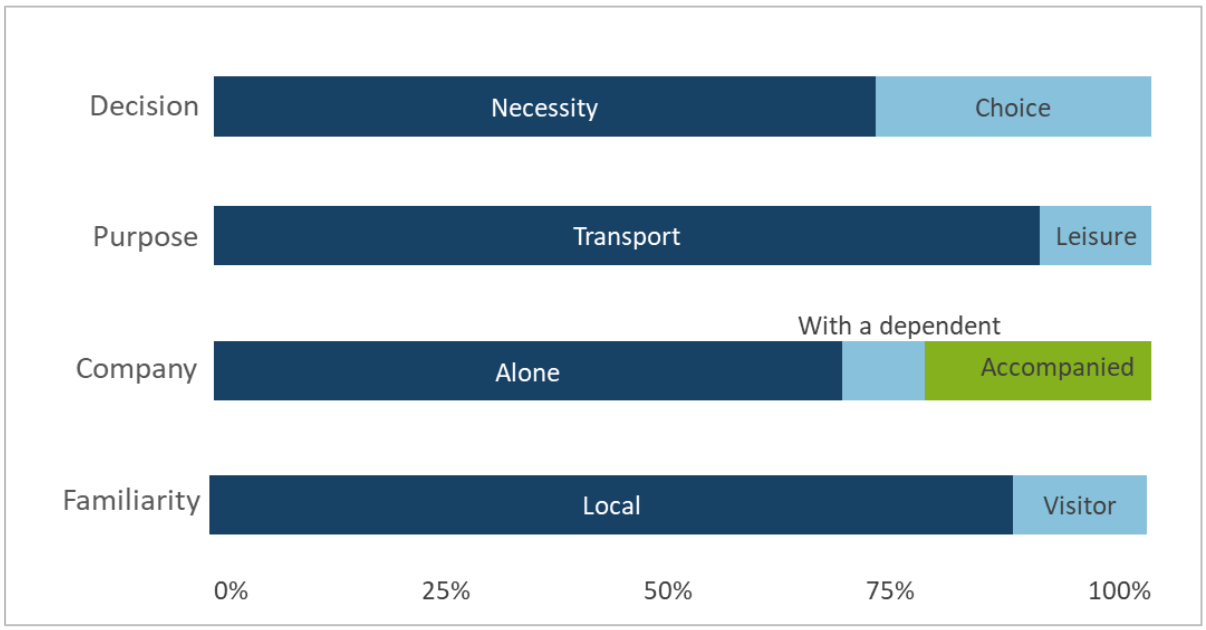


Figure 20. Walk context at all study areas in Kigali.

3.4. Pedestrian experiences in Kigali

From the 1,532 walking experiences shared in the whole region of Kigali, the most frequent type of experience was positive (37.7%), followed by concerns (37%) and negative experiences (25.3%). However, the combination of concerns and negative experiences (62.3%) were more frequent than the positive ones (37.7%).

Experience	N	%
Positive	578	37.7
Concern	567	37.0
Negative	387	25.3
Total	1,532	100

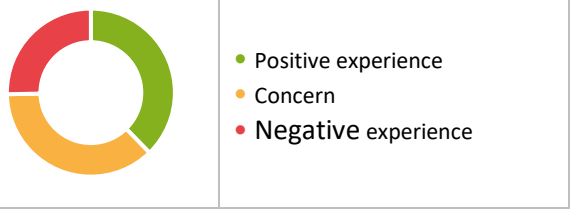


Table 3. Pedestrian experiences in Kigali.

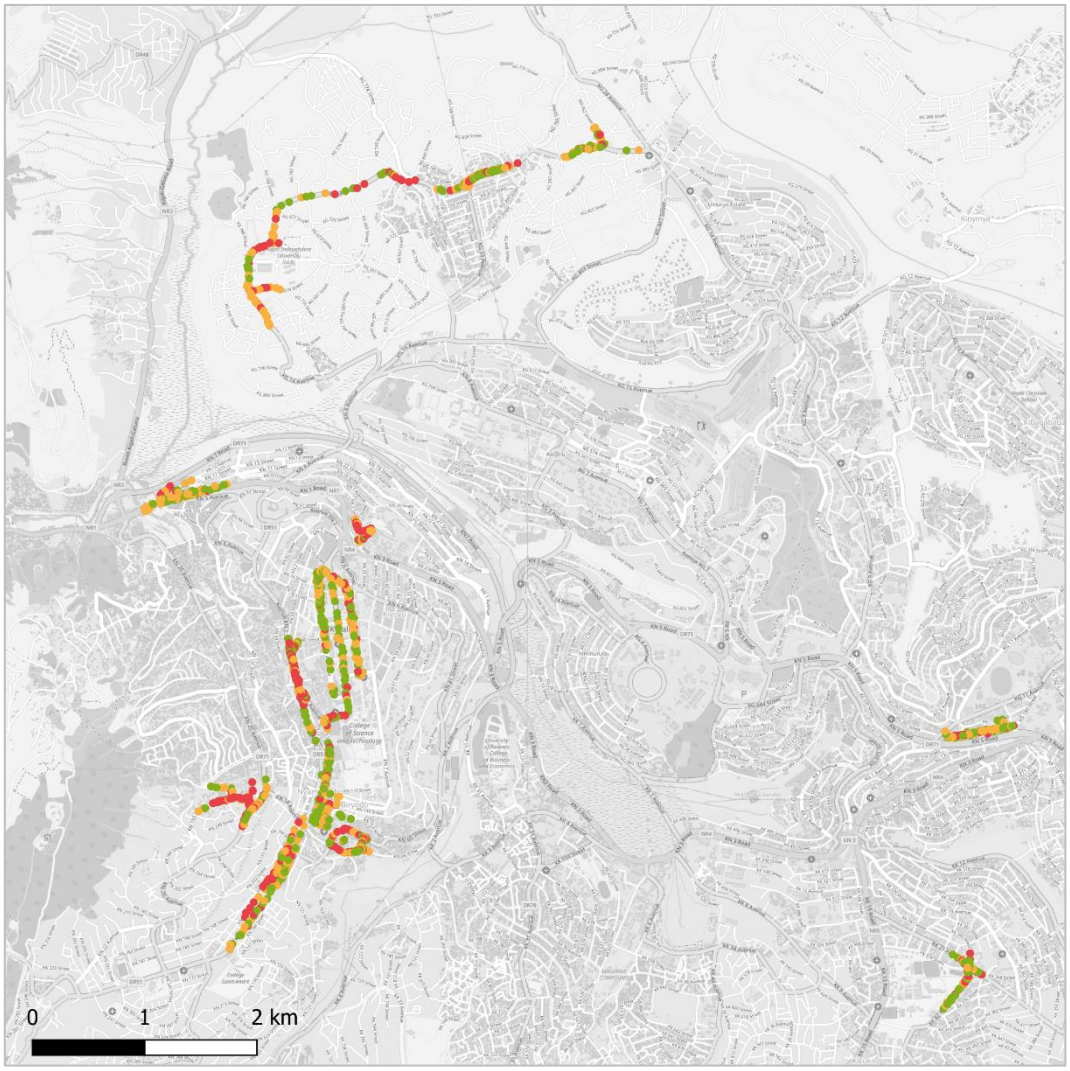


Figure 21. Map of pedestrian experiences in Kigali.

3.5. Environmental determinants

The 1,532 walking experiences collected through interviews were linked to 5,833 observations on the environmental determinants included in the Walkability App as predefined categories.

Environmental determinants related to positive experiences

The most frequent and relevant determinants related to positive experiences were 'Sufficient space and path quality' with 550 observations (9.4%), followed by 'Clean and peaceful' with 386 observations (6.3%) and 'Lighting, seating or raps' with 303 observations (5.2%). The top-5 list also included 'Secure' with 288 observations (4.9%) and 'Trees and visual interest' with 267 observations (4.6%).

Environmental determinants related to negative experiences and concerns

For negative experiences and concerns, 'Unsafe crossing` was the most frequent determinant with 560 observations (9.6%), of which 324 observations were related to concerns (5.6%) and 236 to negative experiences (4%). The second most frequent determinant was `Poor protection from weather' with 456 observations (7.7%), of which 248 were related to concerns (4.3%) and 208 to negative experiences (3.6%). The third most frequent determinant was 'Insufficient space and poor path quality' with 445 observations (7.7%), of which 267 were related to concerns (4.6%) and 178 to negative experiences (3.1%). The top-5 list also included 'Insufficient trees or visual interest' with 328 observations (5.6%), of which 194 were related to concerns (3.3%) and 134 to negative experiences (2.3%), and finally 'Speed of traffic' and 'No pavement' with 299 observations each.

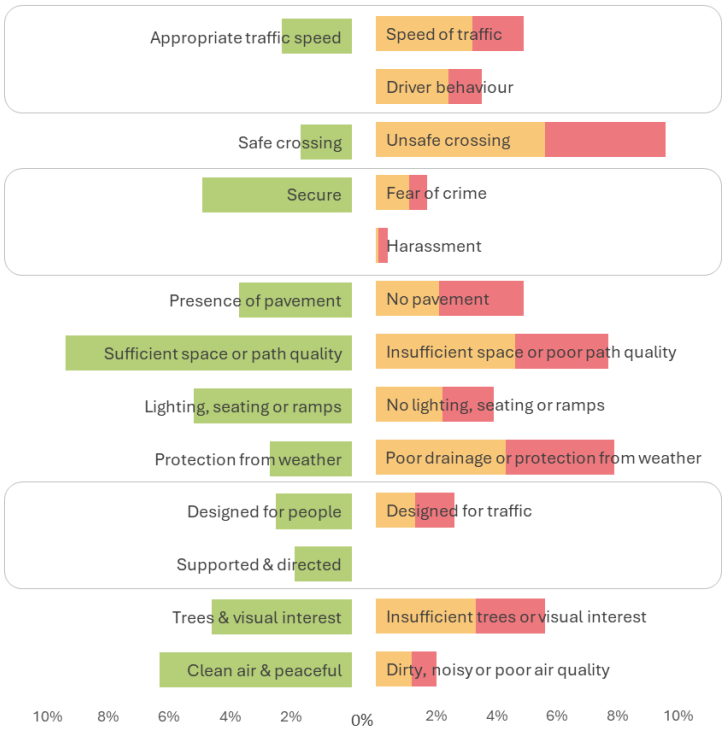


Figure 22. Opposing environmental determinants in Kigali.

Observations on environmental determinants by type of experience in Kigali.

Experience	Environmental Determinant	N	%
Positive	Clean air & peaceful	368	6.3
	Lighting, seating or ramps	303	5.2
	Sufficient space	298	5.1
	Secure	288	4.9
	Trees & visual interest	267	4.6
	Path quality	252	4.3
	The path	218	3.7
	Protection from weather	156	2.7
	Designed for people	145	2.5
	Appropriate traffic speed	133	2.3
	Supported & directed	112	1.9
	Safe crossing	99	1.7
Concerns	Unsafe crossing	324	5.6
	Insufficient space or poor path quality	267	4.6
	Poor drainage or protection from weather	248	4.3
	Insufficient trees or visual interest	194	3.3
	Speed of traffic	189	3.2
	Driver behaviour	140	2.4
	No lighting, seating or ramps	131	2.2
	No path	121	2.1
	Designed for traffic not people	74	1.3
	Dirty, noisy or poor air quality	70	1.2
	Fear of crime	64	1.1
	Harassment	7	0.1
Negative	Unsafe crossing	236	4
	Poor drainage or protection from weather	208	3.6
	Insufficient space or poor path quality	178	3.1
	No path	163	2.8
	Insufficient trees or visual interest	134	2.3
	No lighting, seating or ramps	102	1.7
	Speed of traffic	101	1.7
	Designed for traffic not people	73	1.3
	Driver behaviour	65	1.1
	Dirty, noisy or poor air quality	48	0.8
	Fear of crime	37	0.6
	Harassment	20	0.3
	TOTAL	5,833	100

Table 4. Observations on environmental determinants by type of experience in Kigali.

3.6. Walking experiences and relevant environmental determinants by study areas

The 15 study areas select in Kigali showed a relevant heterogeneity in walking experiences and relevant environmental determinants. The following table and graph show the number and percentage of participants´ observations related to each type of experience in each study area.

	Study Area	Positive experience	Concern	Negative experience	Total observations
1	Camp Kigali School	49	44	31	124
2	Groupe Scholaire EPA- St Michel	43	25	48	116
3	Ntwali Primary School	32	59	42	133
4	St Joseph Le Travailleur Sec. School	13	41	33	87
5	Biryogo Primary School	26	30	34	90
6	Kabusunzu Primary School	13	31	56	100
7	Muhima Primary School	45	44	7	96
8	Kicukiro Primary School	38	20	30	88
9	Glory Secondary School	21	47	26	94
10	FAWE Girls School	67	57	19	143
11	Saint Dominic Primary School	31	30	10	71
12	University of Rwanda	64	47	16	127
13	KN 4 Avenue – Pedestrianised	53	19	10	82
14	Biryogo Car Free Food Street	48	27	8	83
15	Remera Gisimenti Car Free Zone	38	47	18	103
TOTAL		581	568	388	1,537

Table 5. Walking experiences by study area.

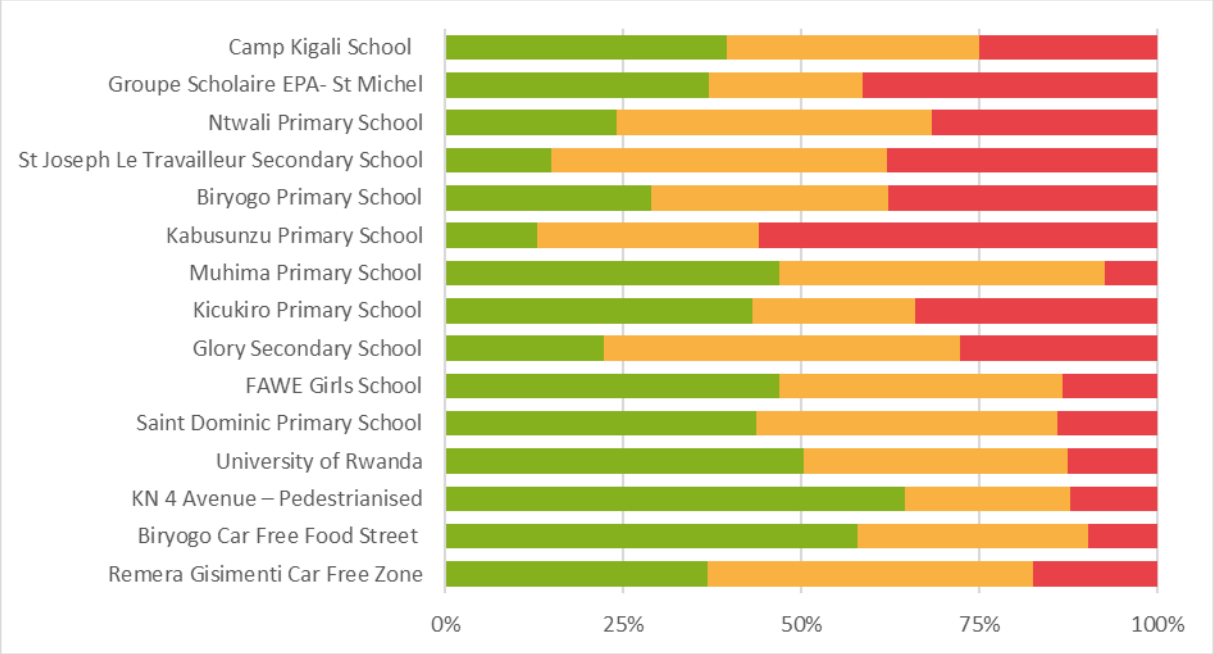
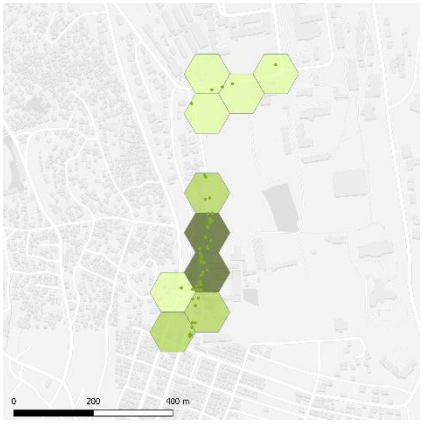
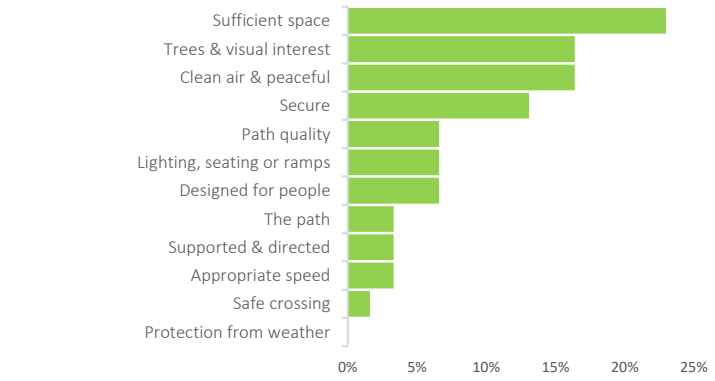


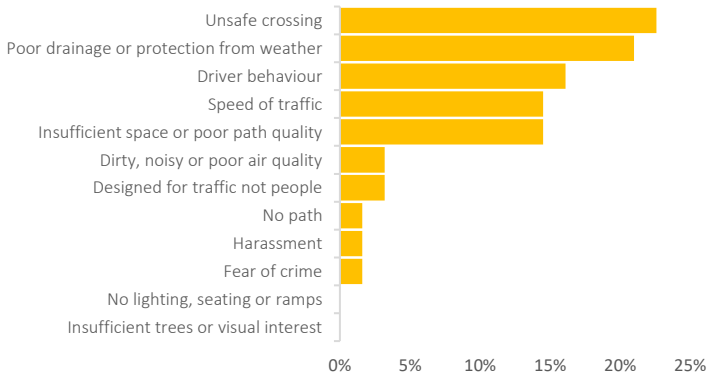
Figure 23. Graph on different walking experiences by study area.

Study area 1: Camp Kigali School

In Camp Kigali School, most of the walking experiences were positive (39.5%) and related to 'Sufficient space' (23%), `Trees and visual interest' (16.4%) and 'Clean and peaceful`(16.4%). Followed by concerns (35.5%) related to 'Unsafe crossing' (22.6%), 'Poor weather protection' (21%) and 'Driver behaviour' (16.1%) . And finally, negative experiences (25%), related to 'Poor protection from weather' (25%), 'Unsafe crossing' (1.8%) and 'Insufficient space or poor path quality' (16.7%).







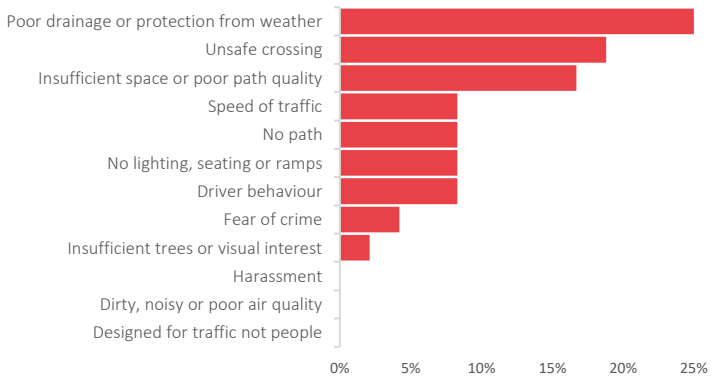


Figure 24. Camp Kigali School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Camp Kigali School.

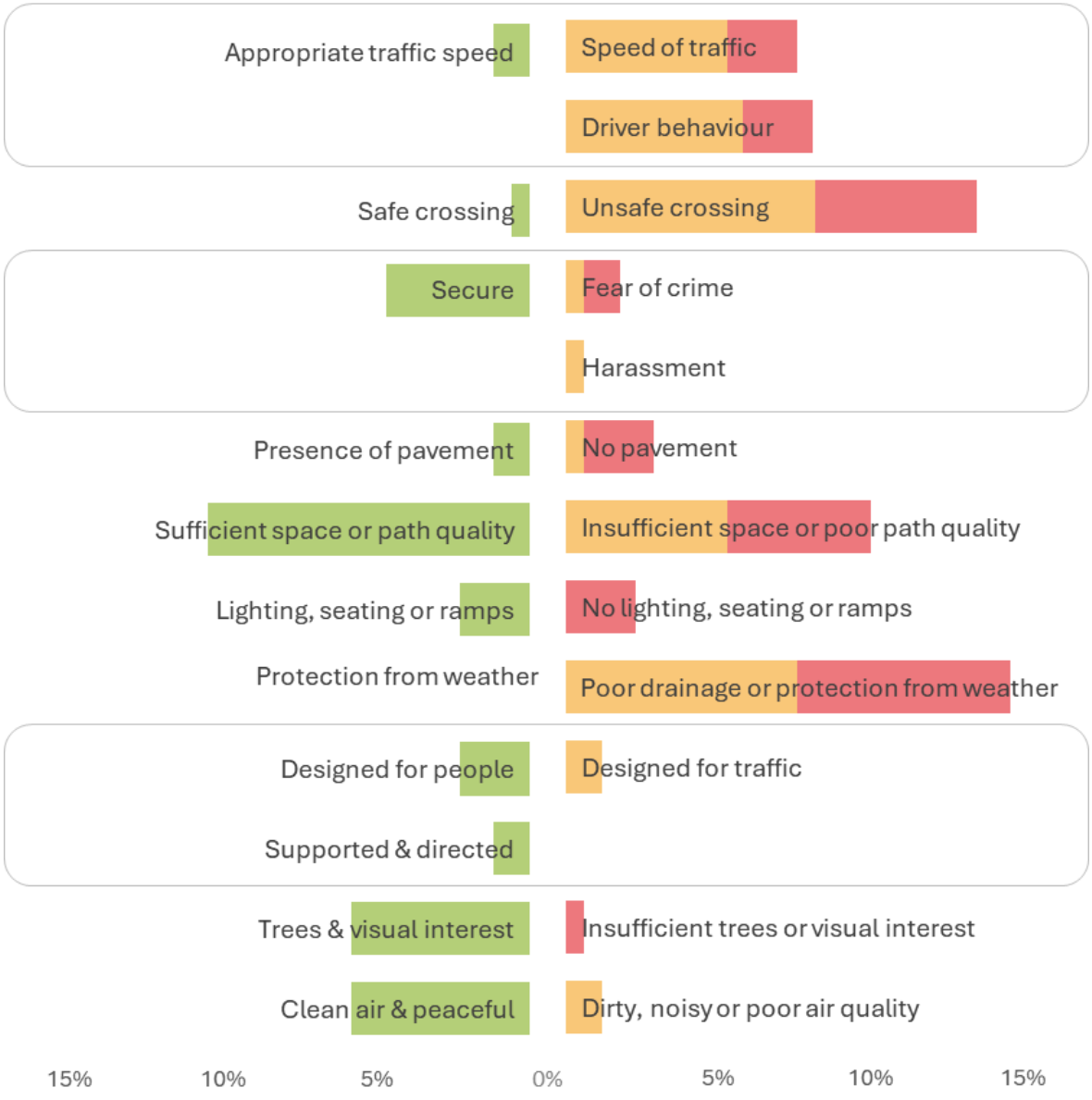


Figure 25. Camp Kigali School, opposing determinants.

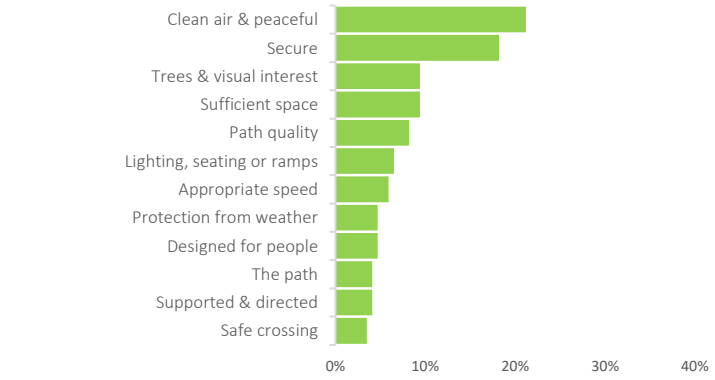
Camp Kigali School - Summary

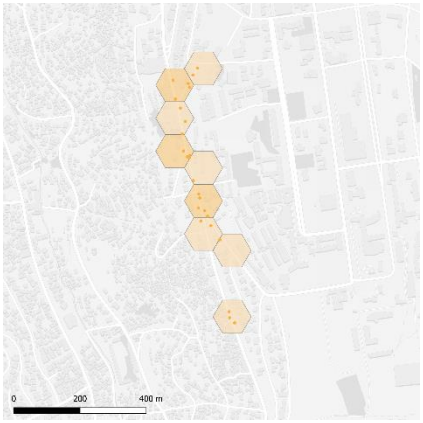
Experience	Environmental Determinant	N	%
Positive	Sufficient space	14	8.2
	Clean air & peaceful	10	5.8
	Trees & visual interest	10	5.8
	Secure	8	4.7
	Designed for people	4	2.3
	Lighting, seating or ramps	4	2.3
	Path quality	4	2.3
	Appropriate traffic speed	2	1.2
	Supported & directed	2	1.2
	The path	2	1.2
	Safe crossing	1	0.6
	Protection from weather	0	0
Concerns	Unsafe crossing	14	8.2
	Poor drainage or protection from weather	13	7.6
	Driver behaviour	10	5.8
	Insufficient space or poor path quality	9	5.3
	Speed of traffic	9	5.3
	Designed for traffic not people	2	1.2
	Dirty, noisy or poor air quality	2	1.2
	Fear of crime	1	0.6
	Harassment	1	0.6
	No path	1	0.6
	Insufficient trees or visual interest	0	0
	No lighting, seating or ramps	0	0
Negative	Poor drainage or protection from weather	12	7
	Unsafe crossing	9	5.3
	Insufficient space or poor path quality	8	4.7
	Driver behaviour	4	2.3
	No lighting, seating or ramps	4	2.3
	No path	4	2.3
	Speed of traffic	4	2.3
	Fear of crime	2	1.2
	Insufficient trees or visual interest	1	0.6
	Designed for traffic not people	0	0
	Dirty, noisy or poor air quality	0	0
	Harassment	0	0
	TOTAL	171	100

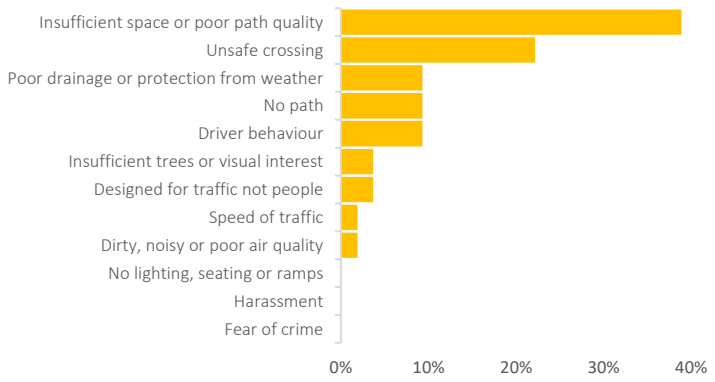
Table 6. Camp Kigali School, summary.

Study area 2: Groupe Scholaire EPA-St Michel Nyarugenge

In Groupe Scholaire EPA-St Michel Nyarugenge, most of the walking experiences were negative (41.4%) and related to 'No path' (25.3%), `Unsafe crossing' (19.9%) and 'Insufficient space or poor path quality`(18.5%). Followed by positive experiences (37.1%) related to 'Clean and peaceful' (21.2%), 'Secure' (18.2%) and 'Trees and visual interest' (9.4%) . And finally, concerns (21.6%), related to 'Insufficient space or poor path quality' (38.9%), 'Unsafe crossing' (22.2%) and 'Poor protection from weather' (9.3%).







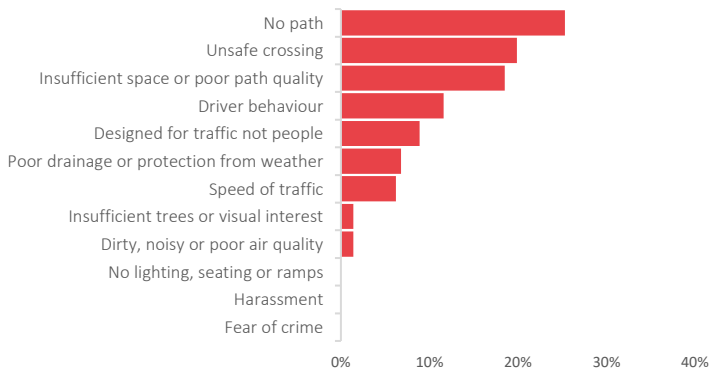


Figure 26. Groupe Scholaire EPA-St Michel Nyarugenge, experiences and determinants.

Relationships between environmental determinants and walking experiences in Groupe Scholaire EPA- St Michel Nyarugenge.

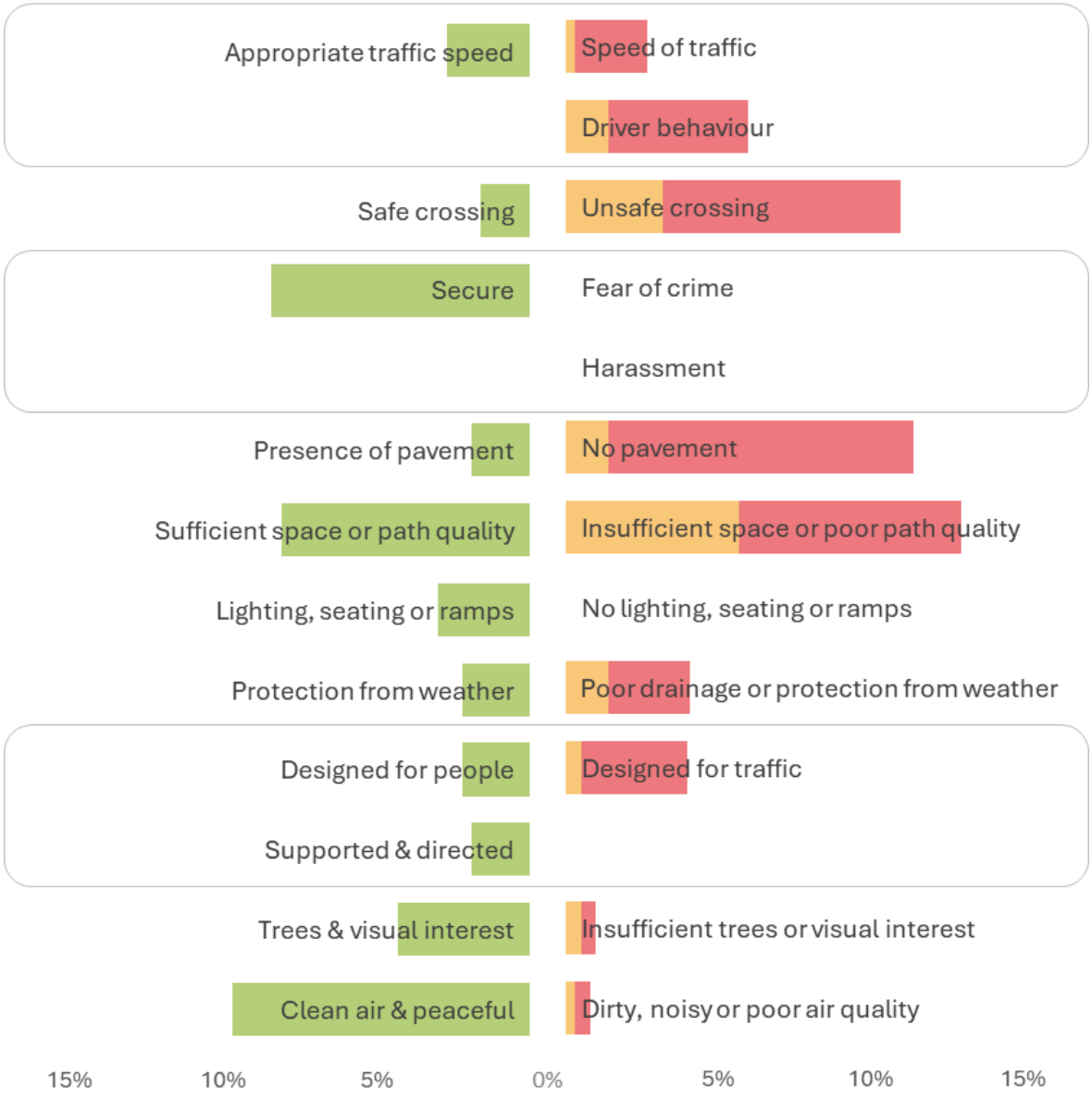


Figure 27. Groupe Scholaire EPA-St Michel Nyarugenge, opposing determinants.

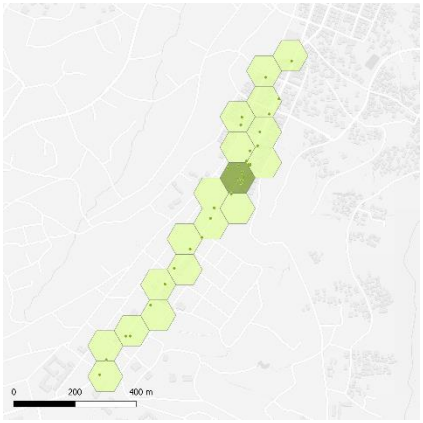
Groupe Scholaire EPA-St Michel Nyarugenge - Summary

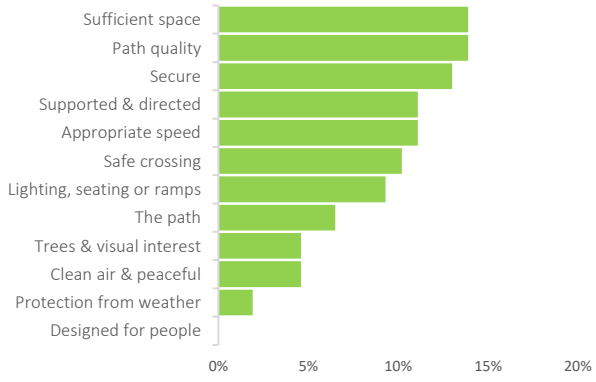
Experience	Environmental Determinant	N	%
Positive	Clean air & peaceful	36	9.7
	Secure	31	8.4
	Sufficient space	16	4.3
	Trees & visual interest	16	4.3
	Path quality	14	3.8
	Lighting, seating or ramps	11	3
	Appropriate traffic speed	10	2.7
	Designed for people	8	2.2
	Protection from weather	8	2.2
	Supported & directed	7	1.9
	The path	7	1.9
	Safe crossing	6	1.6
Concerns	Insufficient space or poor path quality	21	5.7
	Unsafe crossing	12	3.2
	Driver behaviour	5	1.4
	No path	5	1.4
	Poor drainage or protection from weather	5	1.4
	Designed for traffic not people	2	0.5
	Insufficient trees or visual interest	2	0.5
	Dirty, noisy or poor air quality	1	0.3
	Speed of traffic	1	0.3
	Fear of crime	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
Negative	No path	37	10
	Unsafe crossing	29	7.8
	Insufficient space or poor path quality	27	7.3
	Driver behaviour	17	4.6
	Designed for traffic not people	13	3.5
	Poor drainage or protection from weather	10	2.7
	Speed of traffic	9	2.4
	Dirty, noisy or poor air quality	2	0.5
	Insufficient trees or visual interest	2	0.5
	Fear of crime	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
	TOTAL	370	100

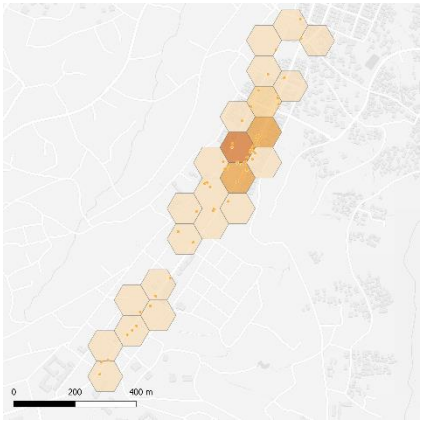
Table 7. Groupe Scholaire EPA-St Michel Nyarugenge, summary.

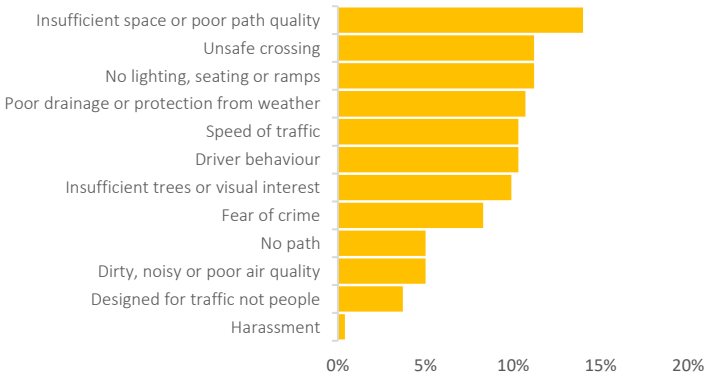
Study area 3: Ntwali Primary School

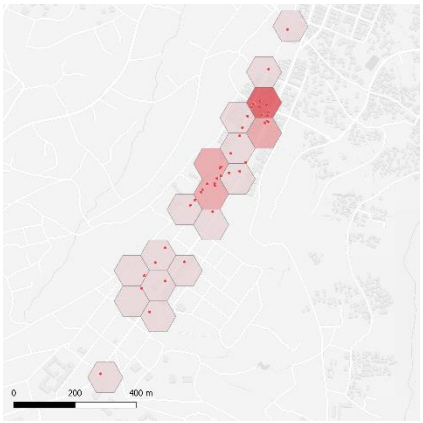
In Katima Mulilo Rd., most of the walking experiences were concerns (44.4%) and related to 'Insufficient space or poor path quality' (14%), `Unsafe crossing' (11.2%) and 'No lighting, seating or ramps`(11.2%). Followed by negative experiences (31.6%) related to 'Unsafe crossing' (16.2%), 'No path' (14.6%) and 'Poor protection from weather' (11.5%). And finally, positive experiences (24.1%), related to 'Sufficient space' (13.9%), 'Path quality' (13.9%) and 'Secure' (13%).











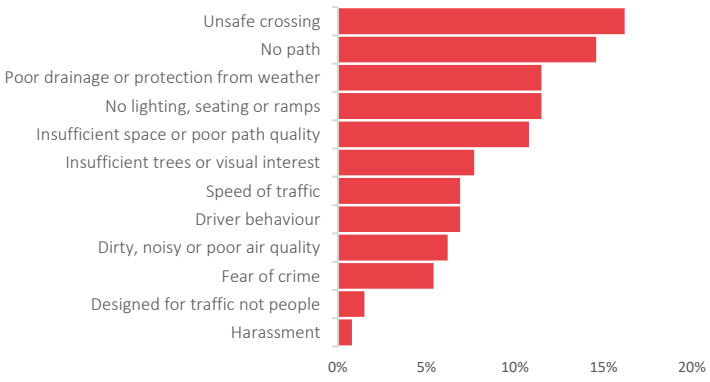


Figure 28. Ntwali Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Ntwali Primary School.

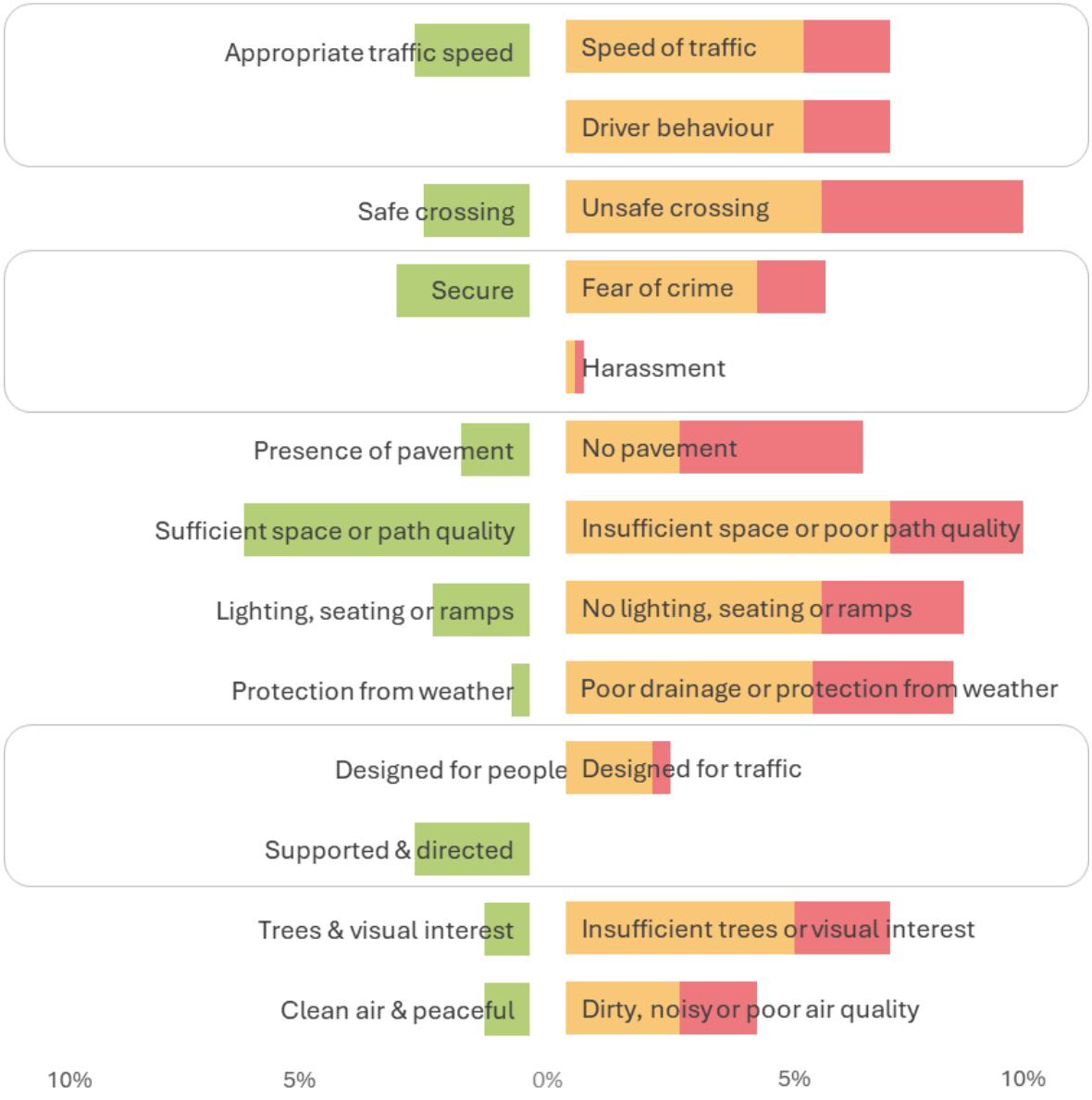


Figure 29. Ntwali Primary School, opposing determinants.

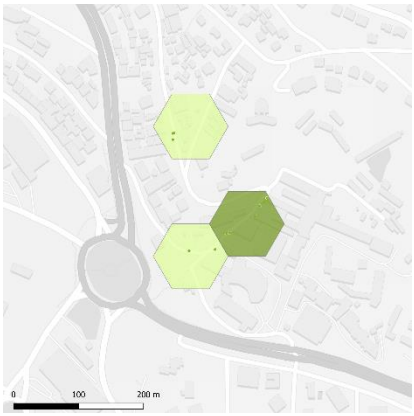
Ntwali Primary School - Summary

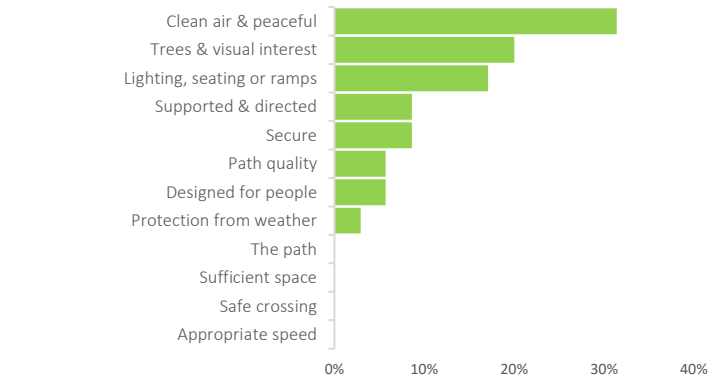
Experience	Environmental Determinant	N	%
Positive	Path quality	15	3.1
	Sufficient space	15	3.1
	Secure	14	2.9
	Appropriate traffic speed	12	2.5
	Supported & directed	12	2.5
	Safe crossing	11	2.3
	Lighting, seating or ramps	10	2.1
	The path	7	1.5
	Clean air & peaceful	5	1
	Trees & visual interest	5	1
	Protection from weather	2	0.4
	Designed for people	0	0
Concerns	Insufficient space or poor path quality	34	7.1
	No lighting, seating or ramps	27	5.6
	Unsafe crossing	27	5.6
	Poor drainage or protection from weather	26	5.4
	Driver behaviour	25	5.2
	Speed of traffic	25	5.2
	Insufficient trees or visual interest	24	5
	Fear of crime	20	4.2
	Dirty, noisy or poor air quality	12	2.5
	No path	12	2.5
	Designed for traffic not people	9	1.9
	Harassment	1	0.2
Negative	Unsafe crossing	21	4.4
	No path	19	4
	No lighting, seating or ramps	15	3.1
	Poor drainage or protection from weather	15	3.1
	Insufficient space or poor path quality	14	2.9
	Insufficient trees or visual interest	10	2.1
	Driver behaviour	9	1.9
	Speed of traffic	9	1.9
	Dirty, noisy or poor air quality	8	1.7
	Fear of crime	7	1.5
	Designed for traffic not people	2	0.4
	Harassment	1	0.2
	TOTAL	480	100

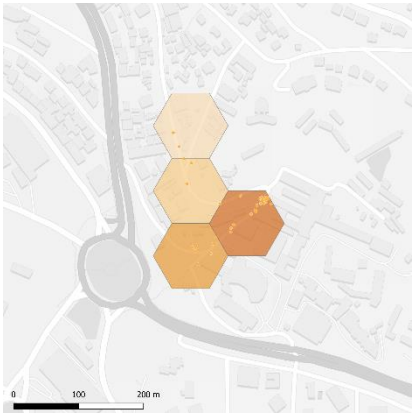
Table 8. Ntwali Primary School, summary.

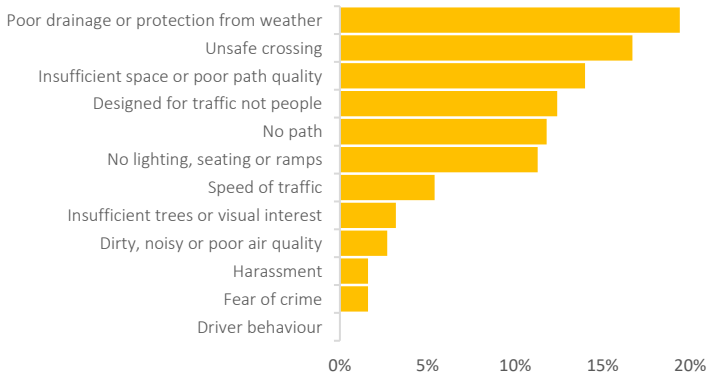
Study area 4: St. Joseph Le Travailleur Secondary School

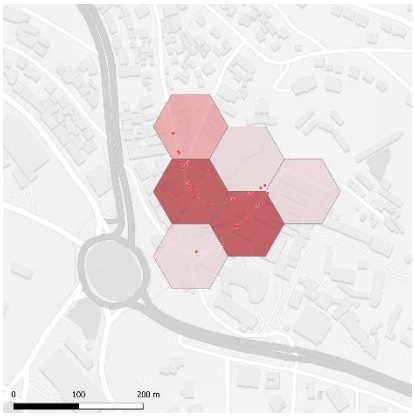
In St. Joseph Le Travailleur Secondary School, most of the walking experiences were concerns (47.1%) and related to 'Poor protection from weather' (19.4%), `Unsafe crossing' (16.7%) and 'Insufficient space or poor path quality`(14%). Followed by negative experiences (37.9%) related to 'Unsafe crossing' (19%), 'Poor protection from weather' (19%) and 'Insufficient space or poor path quality' (13.5%). And finally, positive experiences (14.9%), related to 'Clean and peaceful' (31.4%), 'Trees and visual interest' (20%) and 'Lighting, seating or ramps' (17.1%).











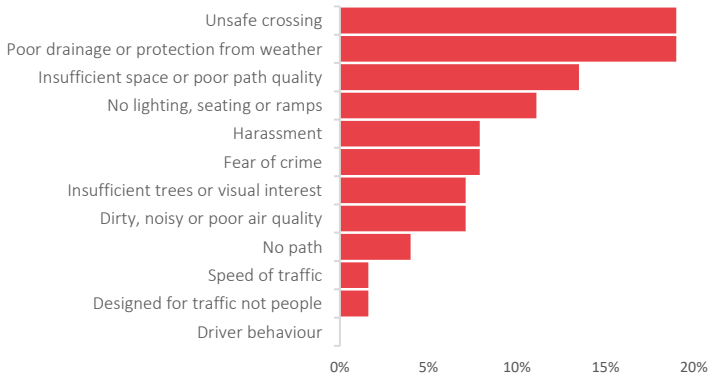


Figure 30. St. Joseph Le Travailleur Secondary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in St. Joseph Le Travailleur Secondary School.

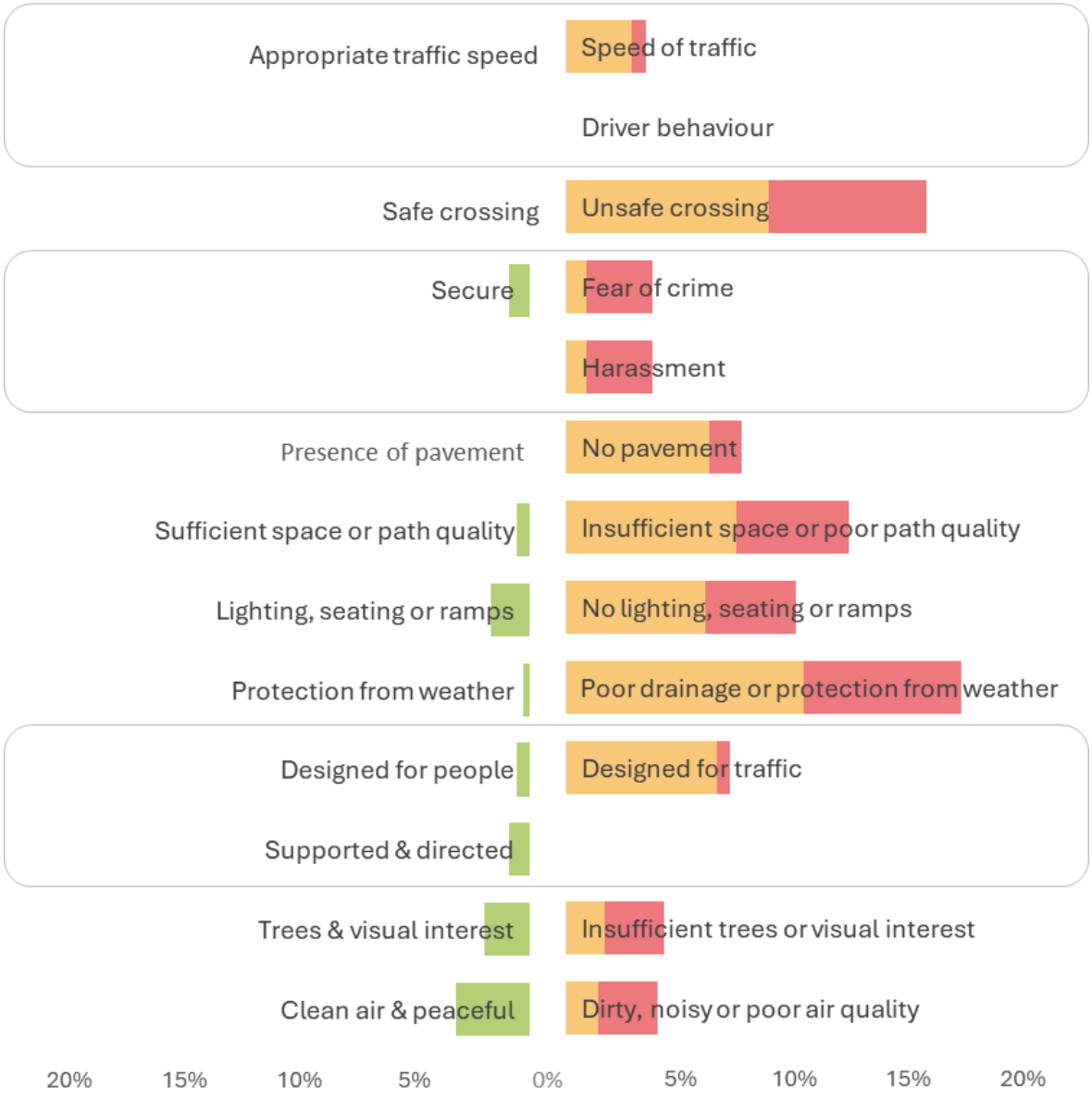


Figure 31. St. Joseph Le Travailleur Secondary School, opposing determinants.

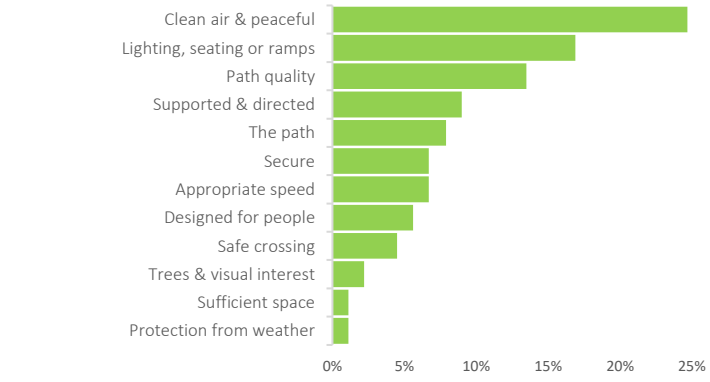
St. Joseph Le Travailleur Secondary School - Summary

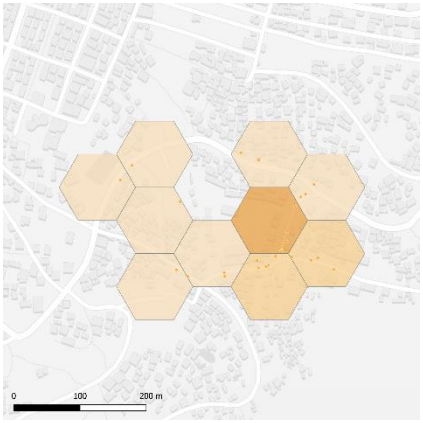
Experience	Environmental Determinant	N	%
Positive	Clean air & peaceful	11	3.2
	Trees & visual interest	7	2
	Lighting, seating or ramps	6	1.7
	Secure	3	0.9
	Supported & directed	3	0.9
	Designed for people	2	0.6
	Path quality	2	0.6
	Protection from weather	1	0.3
	Appropriate traffic speed	0	0
	Safe crossing	0	0
	Sufficient space	0	0
	The path	0	0
Concerns	Poor drainage or protection from weather	36	10.4
	Unsafe crossing	31	8.9
	Insufficient space or poor path quality	26	7.5
	Designed for traffic not people	23	6.6
	No path	22	6.3
	No lighting, seating or ramps	21	6.1
	Speed of traffic	10	2.9
	Insufficient trees or visual interest	6	1.7
	Dirty, noisy or poor air quality	5	1.4
	Fear of crime	3	0.9
	Harassment	3	0.9
	Driver behaviour	0	0
Negative	Poor drainage or protection from weather	24	6.9
	Unsafe crossing	24	6.9
	Insufficient space or poor path quality	17	4.9
	No lighting, seating or ramps	14	4
	Fear of crime	10	2.9
	Harassment	10	2.9
	Dirty, noisy or poor air quality	9	2.6
	Insufficient trees or visual interest	9	2.6
	No path	5	1.4
	Designed for traffic not people	2	0.6
	Speed of traffic	2	0.6
	Driver behaviour	0	0
	TOTAL	347	100

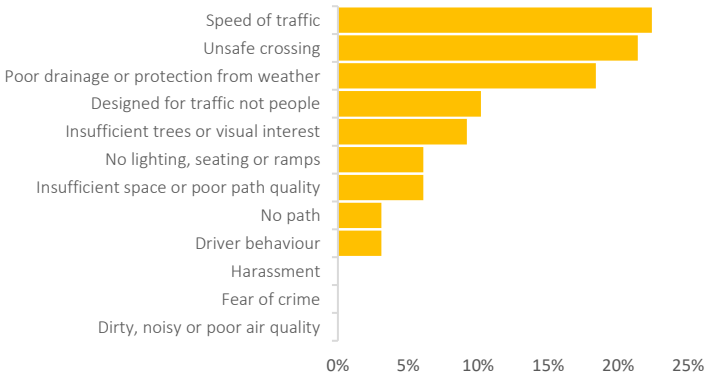
Table 9. St. Joseph Le Travailleur Secondary School, summary.

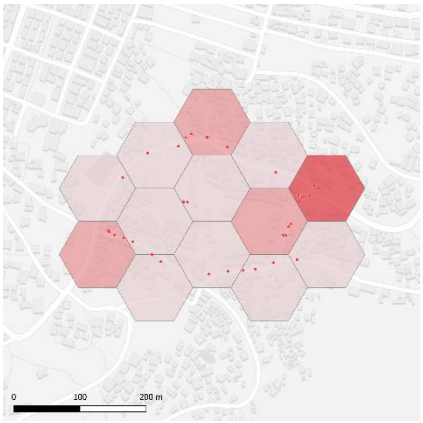
Study area 5: Biryogo Primary School

In Biryogo Primary School, most of the walking experiences were negative (37.8%) and related to 'Poor protection from weather' (21.2%), `Speed of traffic' (19.5%) and 'Designed for traffic`(15.3%). Followed by concerns (33.3%) related to 'Speed of traffic' (22.4%), 'Unsafe crossing' (21.4%) and 'Poor protection from weather' (18.4%). And finally, positive experiences (28.9%), related to 'Clean and peaceful' (24.7%), 'Lighting, seating or ramps' (16.9%) and 'Path quality' (13.5%).









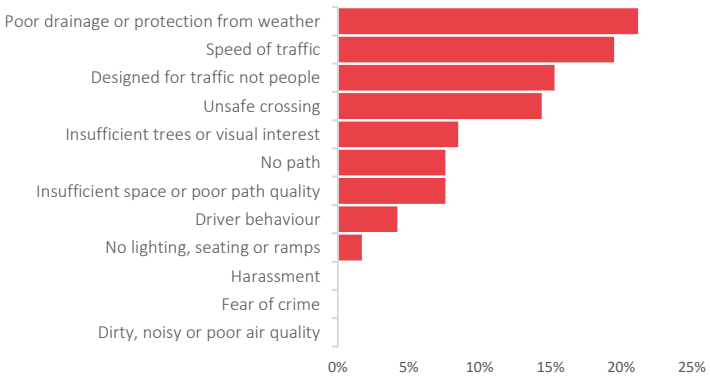


Figure 32. Biryogo Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Biryogo Primary School.

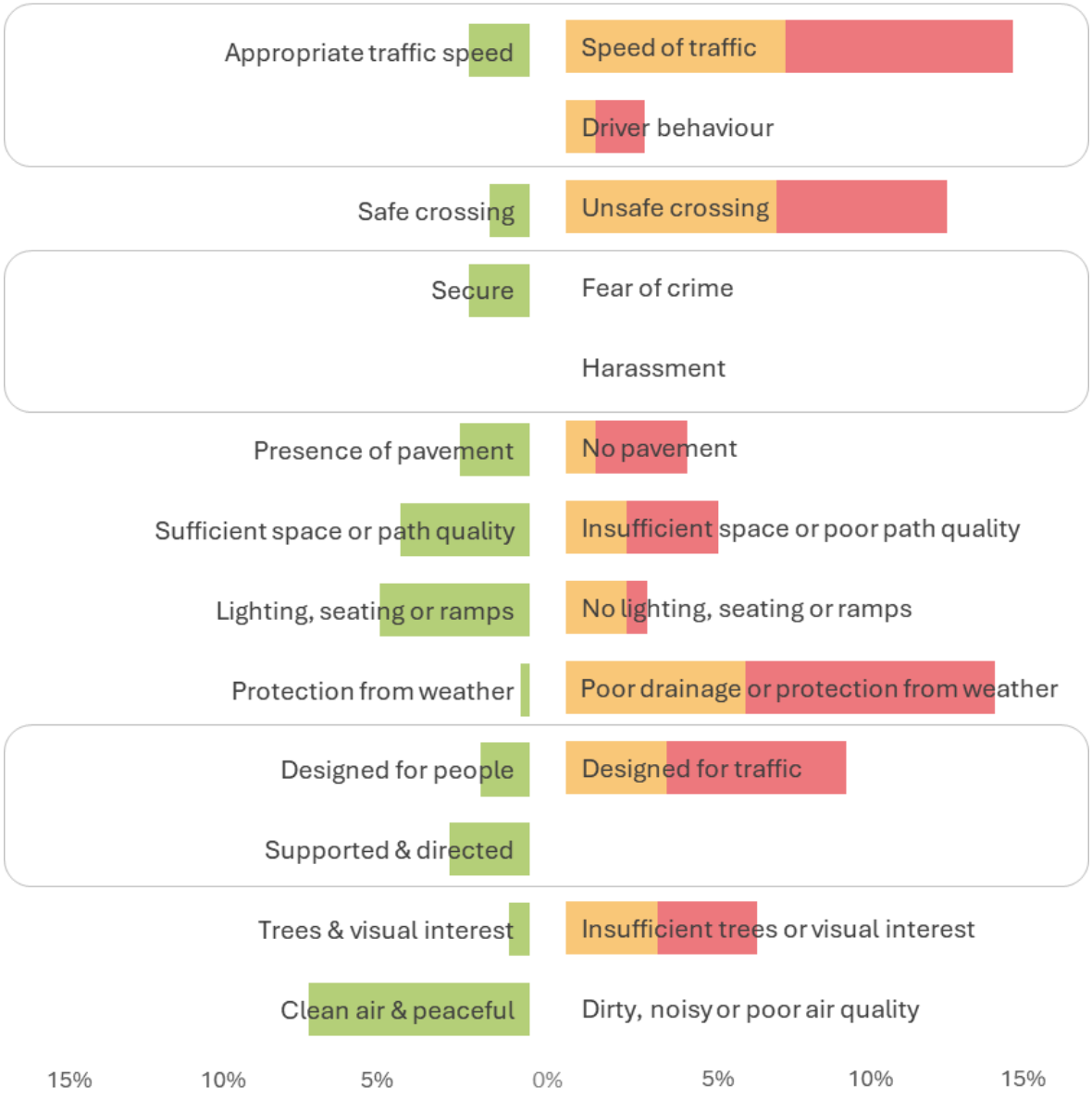


Figure 33. Biryogo Primary School, opposing determinants.

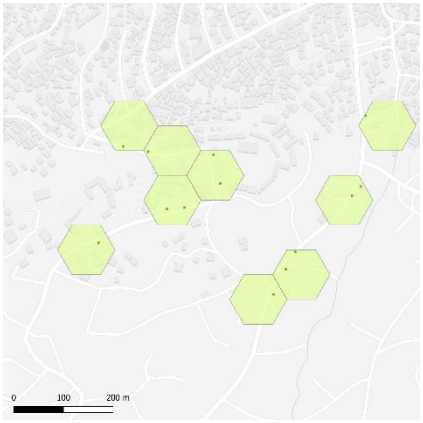
Biryogo Primary School - Summary

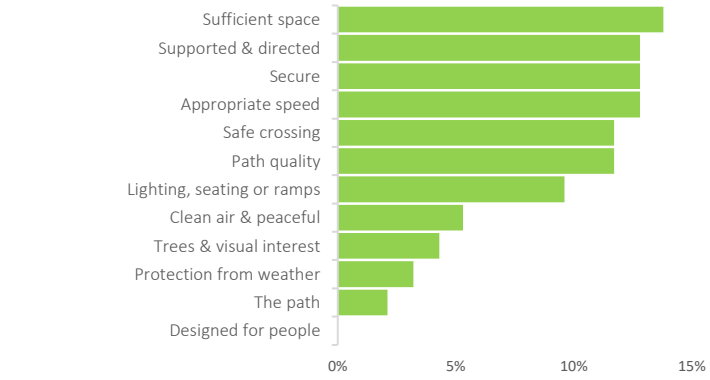
Experience	Environmental Determinant	N	%
Positive	Clean air & peaceful	22	7.2
	Lighting, seating or ramps	15	4.9
	Path quality	12	3.9
	Supported & directed	8	2.6
	The path	7	2.3
	Appropriate traffic speed	6	2
	Secure	6	2
	Designed for people	5	1.6
	Safe crossing	4	1.3
	Trees & visual interest	2	0.7
	Protection from weather	1	0.3
	Sufficient space	1	0.3
Concerns	Speed of traffic	22	7.2
	Unsafe crossing	21	6.9
	Poor drainage or protection from weather	18	5.9
	Designed for traffic not people	10	3.3
	Insufficient trees or visual interest	9	3
	Insufficient space or poor path quality	6	2
	No lighting, seating or ramps	6	2
	Driver behaviour	3	1
	No path	3	1
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
Negative	Poor drainage or protection from weather	25	8.2
	Speed of traffic	23	7.5
	Designed for traffic not people	18	5.9
	Unsafe crossing	17	5.6
	Insufficient trees or visual interest	10	3.3
	Insufficient space or poor path quality	9	3
	No path	9	3
	Driver behaviour	5	1.6
	No lighting, seating or ramps	2	0.7
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	TOTAL	305	100

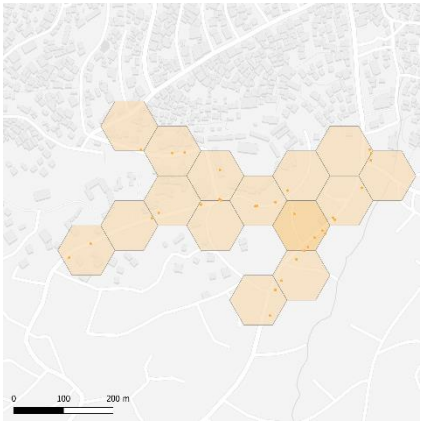
Table 10. Biryogo Primary School, summary.

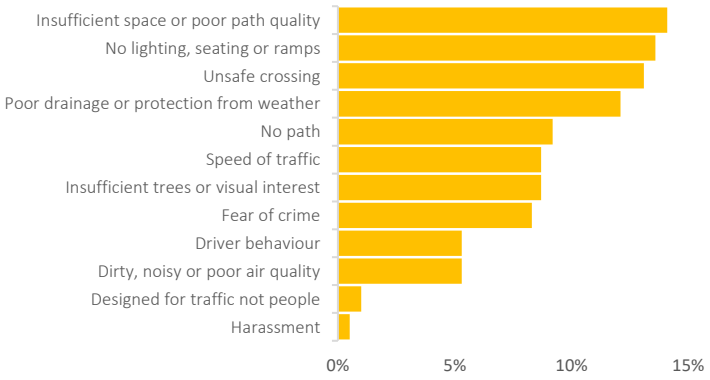
Study area 6: Kabusunzu Primary School

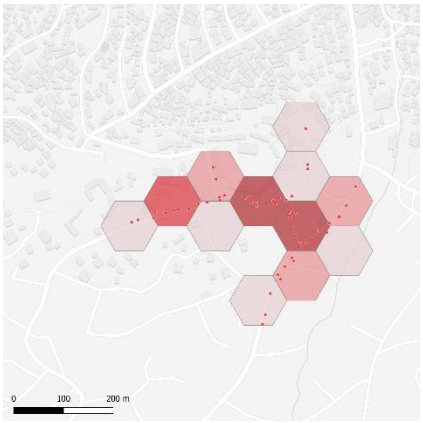
In Kabusunzu Primary School, most of the walking experiences were negative (56%) and related to 'Insufficient space or poor path quality' (14.4%), `Unsafe crossing' (14.1%) and 'Poor protection from weather`(14.1%). Followed by concerns (31%) related to 'Insufficient space or poor path quality' (14.1%), 'No lighting, seating or ramps' (13.6%) and 'Unsafe crossing' (13.1%). And finally, positive experiences (13%), related to 'Sufficient space' (13.8%), 'Supported and directed' (12.8%) and 'Secure' (12.8%).











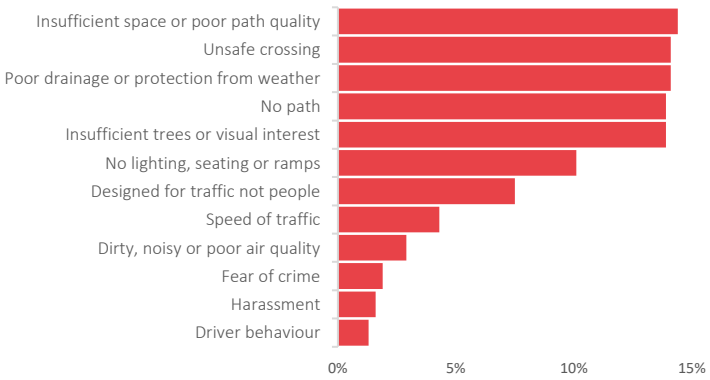


Figure 34. Kabusunzu Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Kabusunzu Primary School.

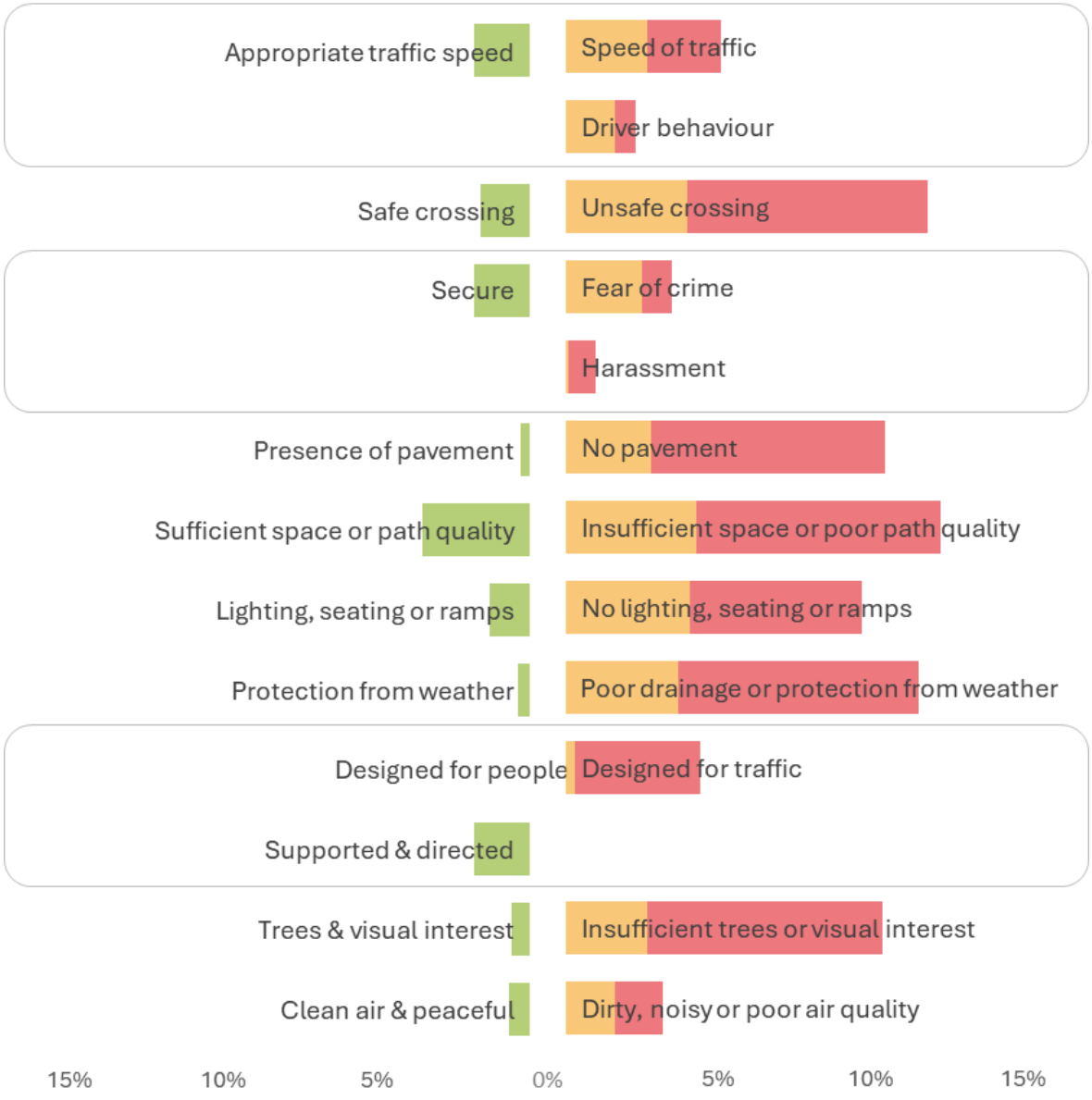


Figure 35. Kabusunzu Primary School, opposing determinants.

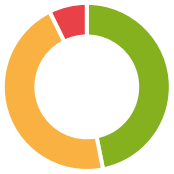
Kabusunzu Primary School - Summary

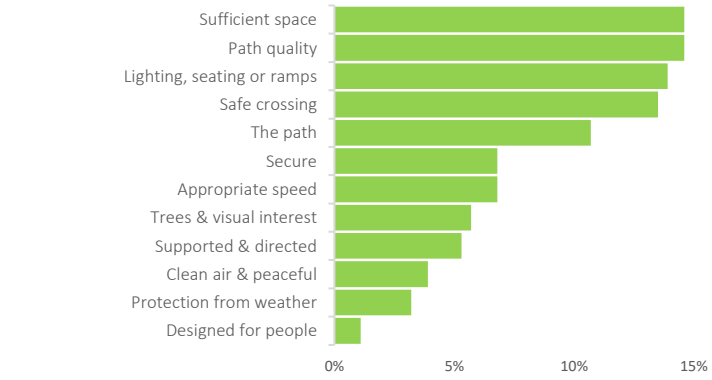
Experience	Environmental Determinant	N	%
Positive	Sufficient space	13	1.9
	Appropriate traffic speed	12	1.8
	Secure	12	1.8
	Supported & directed	12	1.8
	Path quality	11	1.6
	Safe crossing	11	1.6
	Lighting, seating or ramps	9	1.3
	Clean air & peaceful	5	0.7
	Trees & visual interest	4	0.6
	Protection from weather	3	0.4
	The path	2	0.3
	Designed for people	0	0
Concerns	Insufficient space or poor path quality	29	4.3
	No lighting, seating or ramps	28	4.1
	Unsafe crossing	27	4
	Poor drainage or protection from weather	25	3.7
	No path	19	2.8
	Insufficient trees or visual interest	18	2.7
	Speed of traffic	18	2.7
	Fear of crime	17	2.5
	Dirty, noisy or poor air quality	11	1.6
	Driver behaviour	11	1.6
	Designed for traffic not people	2	0.3
	Harassment	1	0.1
Negative	Insufficient space or poor path quality	54	8
	Poor drainage or protection from weather	53	7.9
	Unsafe crossing	53	7.9
	Insufficient trees or visual interest	52	7.7
	No path	52	7.7
	No lighting, seating or ramps	38	5.6
	Designed for traffic not people	28	4.1
	Speed of traffic	16	2.4
	Dirty, noisy or poor air quality	11	1.6
	Fear of crime	7	1
	Harassment	6	0.9
	Driver behaviour	5	0.7
	TOTAL	675	100

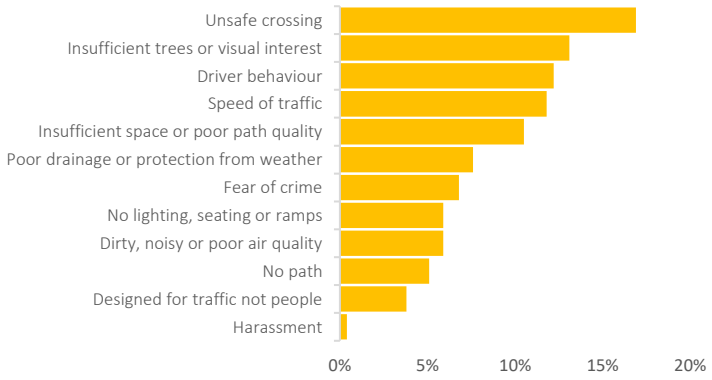
Table 11. Kabusunzu Primary School, summary.

Study area 7: Muhima Primary School

In Muhima Primary School, most of the walking experiences were positive (46.9%) and related to 'Sufficient space' (14.6%), `Path quality' (14.6%) and 'Lighting, seating or ramps` (13.9%). Followed by concerns (45.8%) related to 'Unsafe crossing' (16.9%), 'Insufficient trees or visual interest' (13.1%) and 'Driver behaviour' (12.2%). And finally, negative experiences (7.3%), related to 'Driver behaviour' (12.5%), 'Unsafe crossing' (10.4%) and 'Speed of traffic' (10.4%).







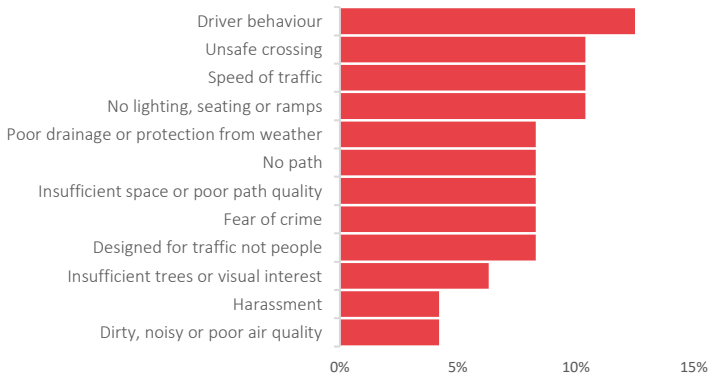


Figure 36. Muhima Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Muhima Primary School.

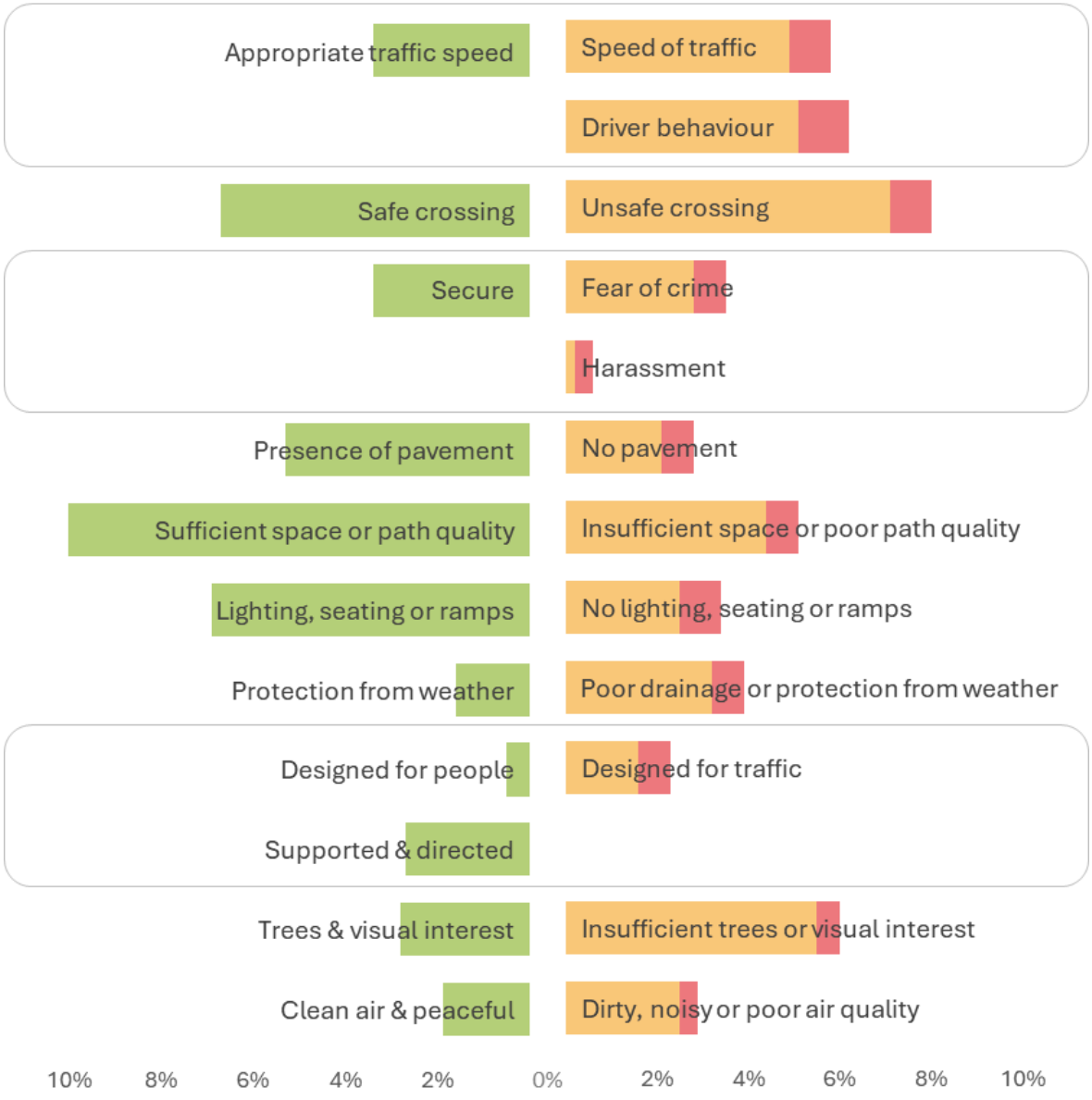


Figure 37. Muhima Primary School, opposing determinants.

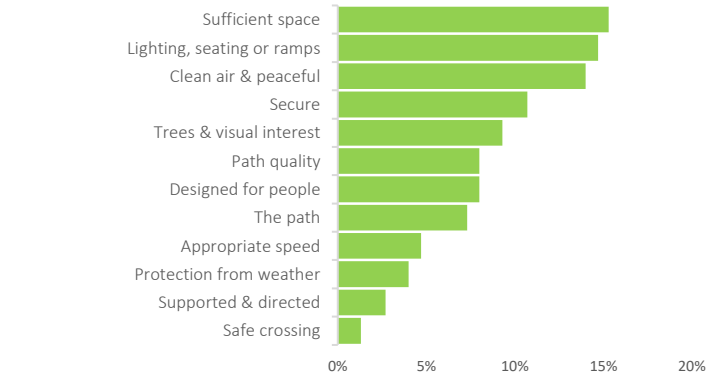
Muhima Primary School - Summary

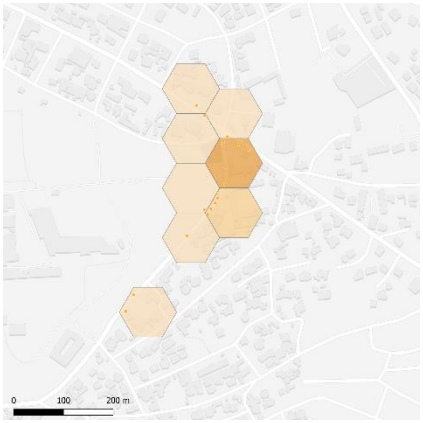
Experience	Environmental Determinant	N	%
Positive	Path quality	41	7.2
	Sufficient space	41	7.2
	Lighting, seating or ramps	39	6.9
	Safe crossing	38	6.7
	The path	30	5.3
	Appropriate traffic speed	19	3.4
	Secure	19	3.4
	Trees & visual interest	16	2.8
	Supported & directed	15	2.7
	Clean air & peaceful	11	1.9
	Protection from weather	9	1.6
	Designed for people	3	0.5
Concerns	Unsafe crossing	40	7.1
	Insufficient trees or visual interest	31	5.5
	Driver behaviour	29	5.1
	Speed of traffic	28	4.9
	Insufficient space or poor path quality	25	4.4
	Poor drainage or protection from weather	18	3.2
	Fear of crime	16	2.8
	Dirty, noisy or poor air quality	14	2.5
	No lighting, seating or ramps	14	2.5
	No path	12	2.1
	Designed for traffic not people	9	1.6
	Harassment	1	0.2
Negative	Driver behaviour	6	1.1
	No lighting, seating or ramps	5	0.9
	Speed of traffic	5	0.9
	Unsafe crossing	5	0.9
	Designed for traffic not people	4	0.7
	Fear of crime	4	0.7
	Insufficient space or poor path quality	4	0.7
	No path	4	0.7
	Poor drainage or protection from weather	4	0.7
	Insufficient trees or visual interest	3	0.5
	Dirty, noisy or poor air quality	2	0.4
	Harassment	2	0.4
	TOTAL	566	100

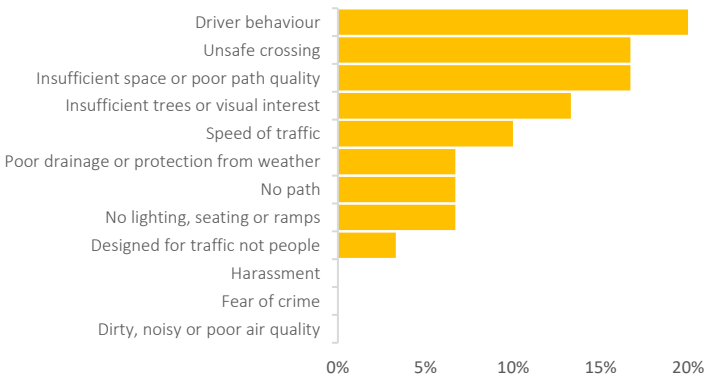
Table 12. Muhima Primary School, summary.

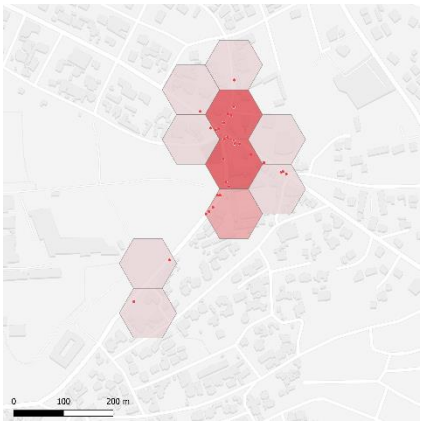
Study area 8: Kicukiro Primary School

In Kicukiro Primary School, most of the walking experiences were positive (43.2%) and related to 'Suffieint space' (15.3%), `Lighting, seating or ramps' (14.7%) and 'clean and peaceful` (14%). Followed by negative experiences (34.1%) related to 'Poor protection from weather' (24%), 'Insufficient trees or visual interest' (18.7%) and 'Unsafe crossing' (17.3%). And finally, concerns (22.7%), related to 'Driver behaviour' (20%), 'Unsafe crossing' (16.7%) and 'Insufficient space or poor path quality' (16.7%).









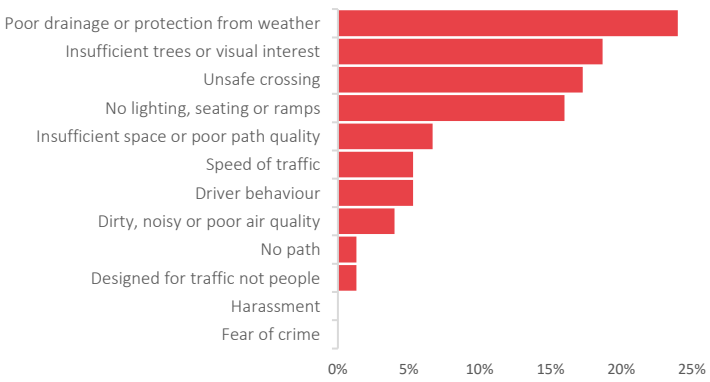


Figure 38. Kicukiro Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Kicukiro Primary School.

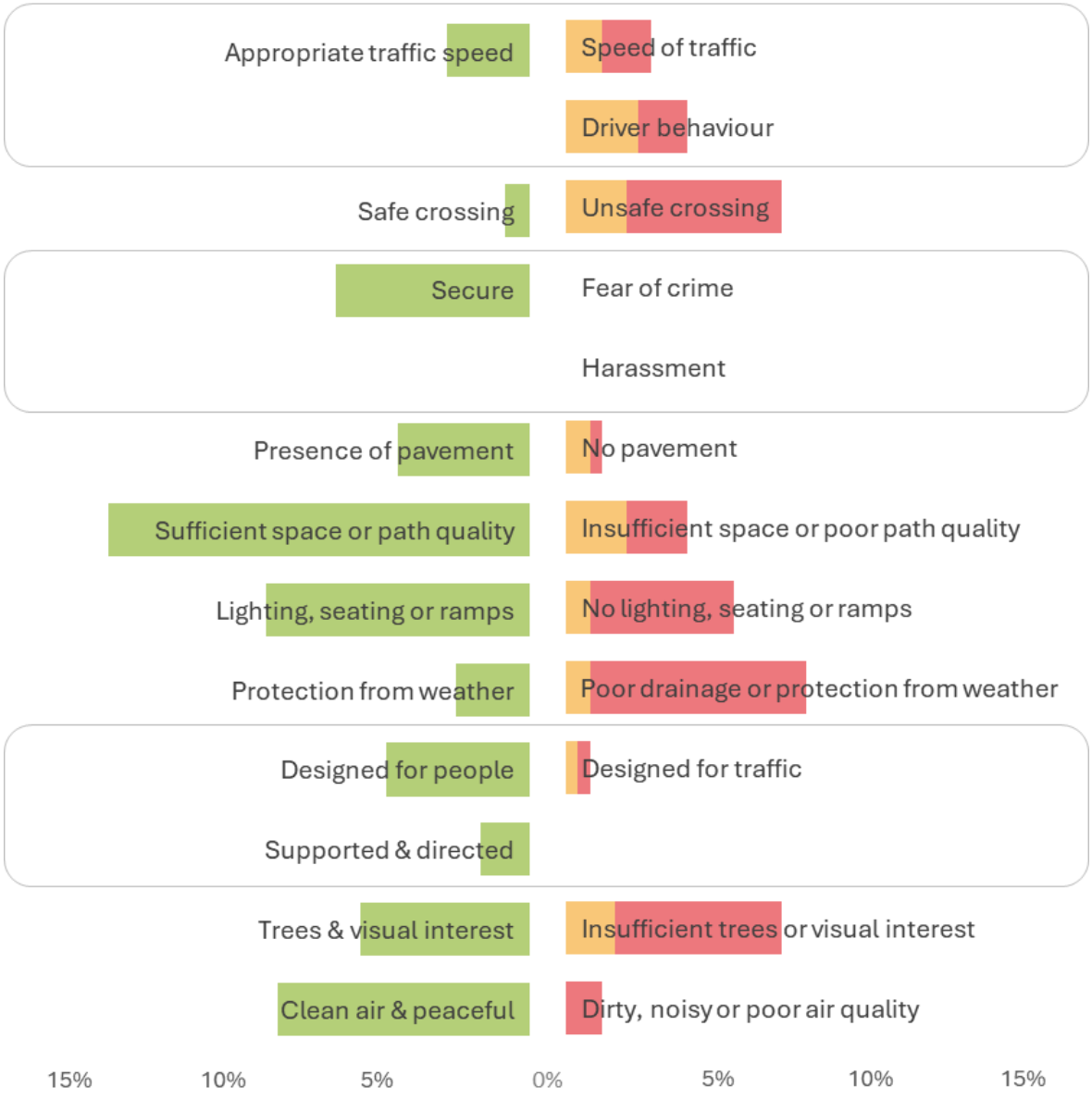


Figure 39. Kicukiro Primary School, opposing determinants.

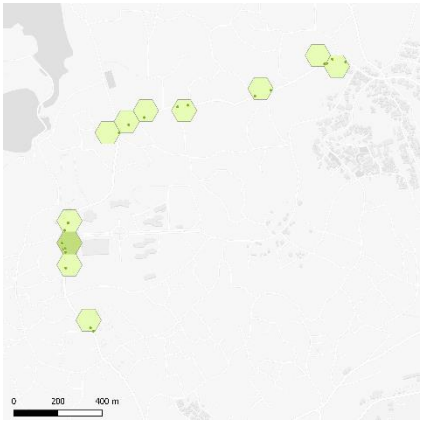
Kicukiro Primary School - Summary

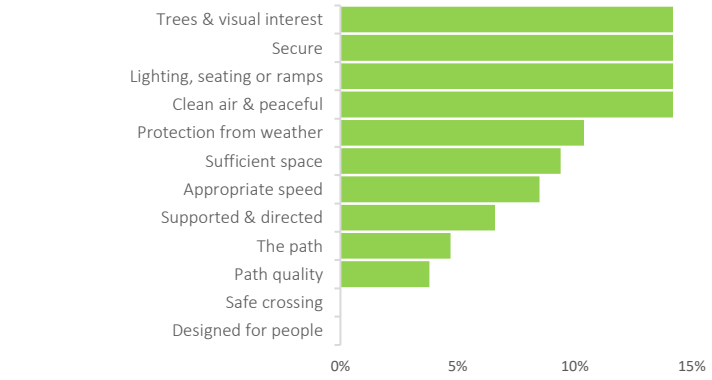
Experience	Environmental Determinant	N	%
Positive	Sufficient space	23	9
	Lighting, seating or ramps	22	8.6
	Clean air & peaceful	21	8.2
	Secure	16	6.3
	Trees & visual interest	14	5.5
	Designed for people	12	4.7
	Path quality	12	4.7
	The path	11	4.3
	Appropriate traffic speed	7	2.7
	Protection from weather	6	2.4
	Supported & directed	4	1.6
	Safe crossing	2	0.8
Concerns	Driver behaviour	6	2.4
	Insufficient space or poor path quality	5	2
	Unsafe crossing	5	2
	Insufficient trees or visual interest	4	1.6
	Speed of traffic	3	1.2
	No lighting, seating or ramps	2	0.8
	No path	2	0.8
	Poor drainage or protection from weather	2	0.8
	Designed for traffic not people	1	0.4
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
Negative	Poor drainage or protection from weather	18	7.1
	Insufficient trees or visual interest	14	5.5
	Unsafe crossing	13	5.1
	No lighting, seating or ramps	12	4.7
	Insufficient space or poor path quality	5	2
	Driver behaviour	4	1.6
	Speed of traffic	4	1.6
	Dirty, noisy or poor air quality	3	1.2
	Designed for traffic not people	1	0.4
	No path	1	0.4
	Fear of crime	0	0
	Harassment	0	0
	TOTAL	255	100

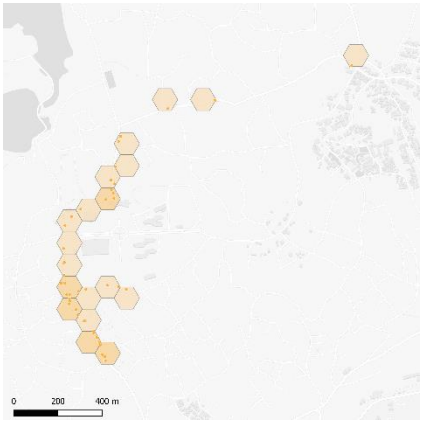
Table 13. Kicukiro Primary School, summary.

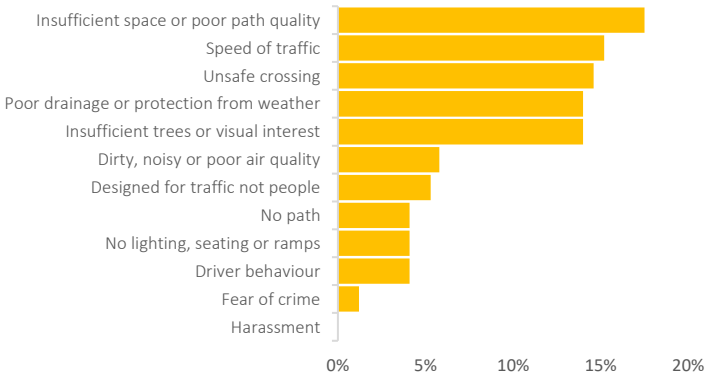
Study area 9: Glory Secondary School

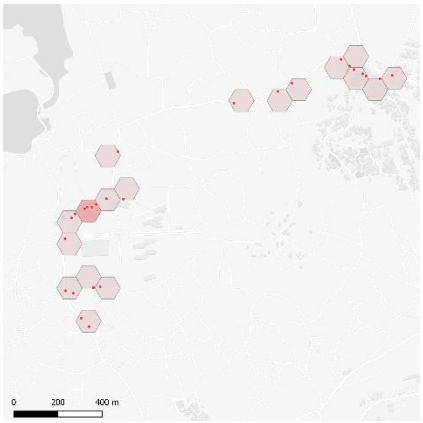
In Glory Secondary School, most of the walking experiences were concerns (50%) and related to 'Insufficient space or poor path quality' (17.5%), `speed of traffic' (15.2%) and 'Unsafe crossing' (14.6%). Followed by negative experiences (27.7%) related to 'Unsafe crossing' (20.2%), 'Poor protection from weather' (19%) and 'Insufficient space or poor path quality' (19%). And finally, positive experiences (22.3%), related to 'Trees and visual interest' (14.2%), 'Secure' (14.2%) and 'Lighting, seating or ramps' (14.2%).











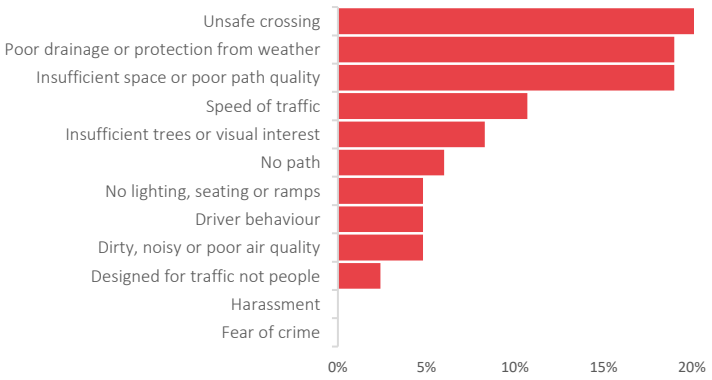


Figure 40. Glory Secondary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Glory Secondary School.

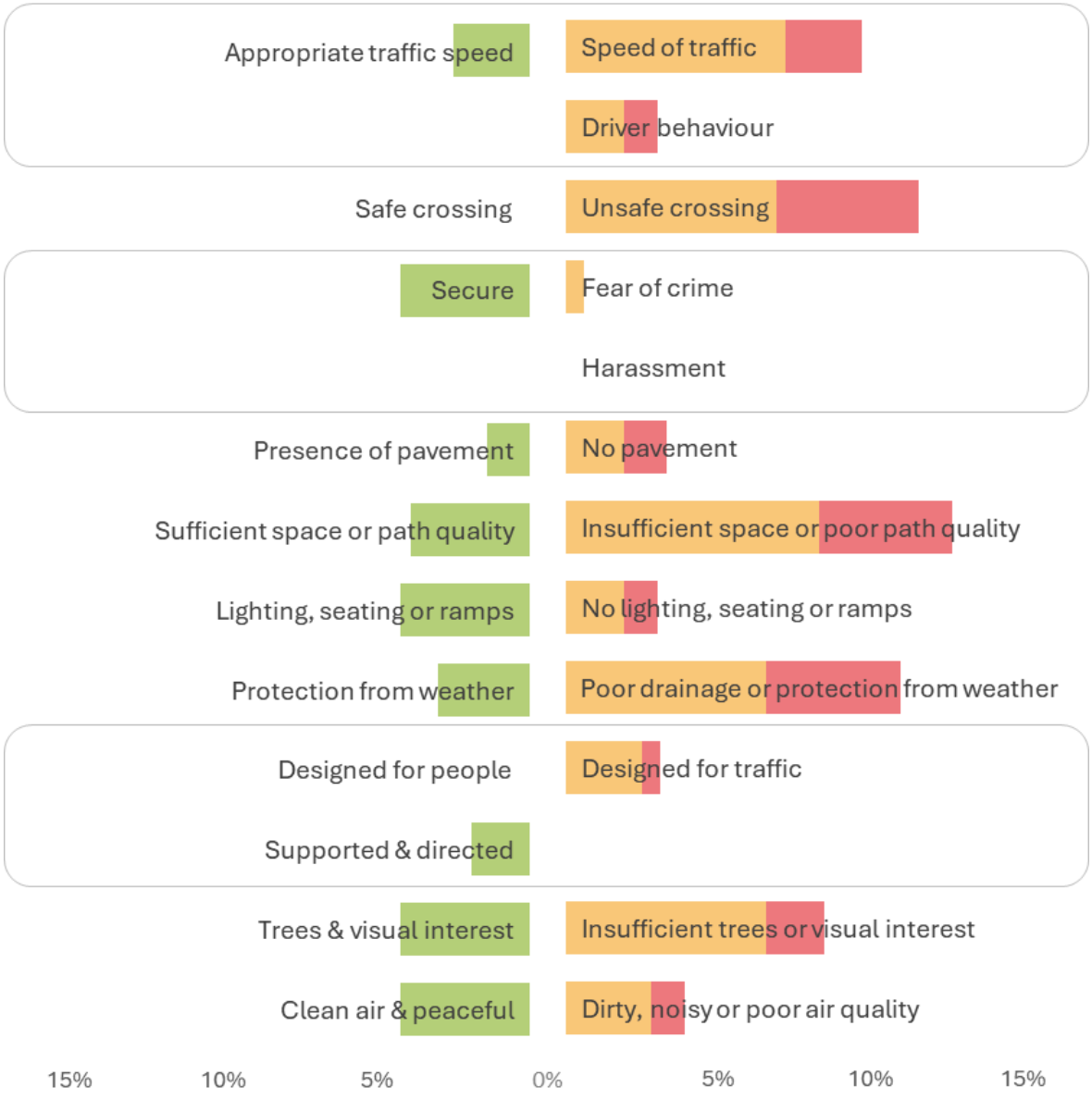


Figure 41. Glory Secondary School, opposing determinants.

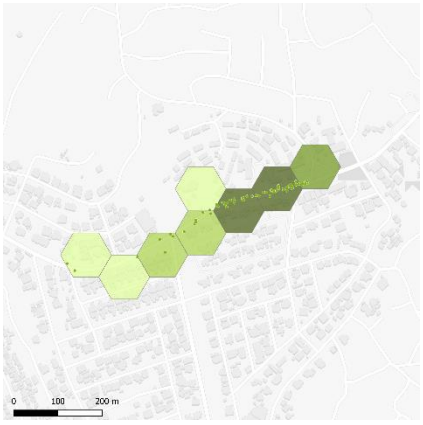
Glory Secondary School - Summary

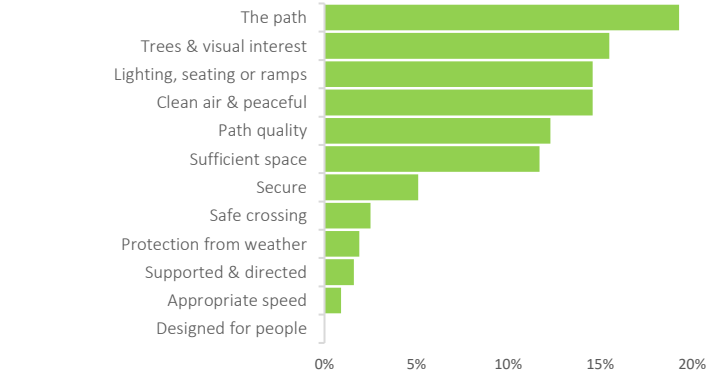
Experience	Environmental Determinant	N	%
Positive	Clean air & peaceful	15	4.2
	Lighting, seating or ramps	15	4.2
	Secure	15	4.2
	Trees & visual interest	15	4.2
	Protection from weather	11	3
	Sufficient space	10	2.8
	Appropriate traffic speed	9	2.5
	Supported & directed	7	1.9
	The path	5	1.4
	Path quality	4	1.1
	Designed for people	0	0
	Safe crossing	0	0
Concerns	Insufficient space or poor path quality	30	8.3
	Speed of traffic	26	7.2
	Unsafe crossing	25	6.9
	Insufficient trees or visual interest	24	6.6
	Poor drainage or protection from weather	24	6.6
	Dirty, noisy or poor air quality	10	2.8
	Designed for traffic not people	9	2.5
	Driver behaviour	7	1.9
	No lighting, seating or ramps	7	1.9
	No path	7	1.9
	Fear of crime	2	0.6
	Harassment	0	0
Negative	Unsafe crossing	17	4.7
	Insufficient space or poor path quality	16	4.4
	Poor drainage or protection from weather	16	4.4
	Speed of traffic	9	2.5
	Insufficient trees or visual interest	7	1.9
	No path	5	1.4
	Dirty, noisy or poor air quality	4	1.1
	Driver behaviour	4	1.1
	No lighting, seating or ramps	4	1.1
	Designed for traffic not people	2	0.6
	Fear of crime	0	0
	Harassment	0	0
	TOTAL	361	100

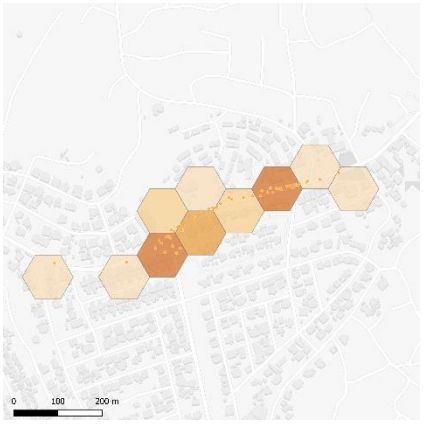
Table 14. Glory Secondary School, summary.

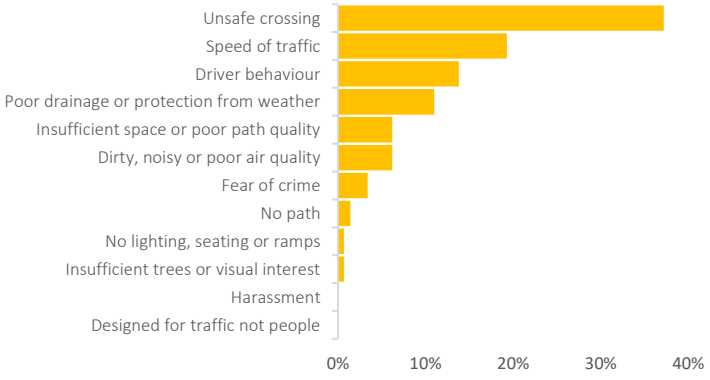
Study area 10: FAWE Girls School

In FAWE Girls School, most of the walking experiences were positive (46.9%) and related to 'Presence of footpath' (19.3%), `Trees and visual interest' (15.5%) and 'Lighting, seating or ramps' (14.6%). Followed by concerns (39.9%) related to 'Unsafe crossing' (37.2%), 'Speed of traffic' (19.3%) and 'Driver behaviour' (13.8%). And finally, negative experiences (13.3%), related to 'Unsafe crossing' (30%), 'Speed of traffic' (23.3%) and 'Dirty, noisy or poor air quality' (13.3%).









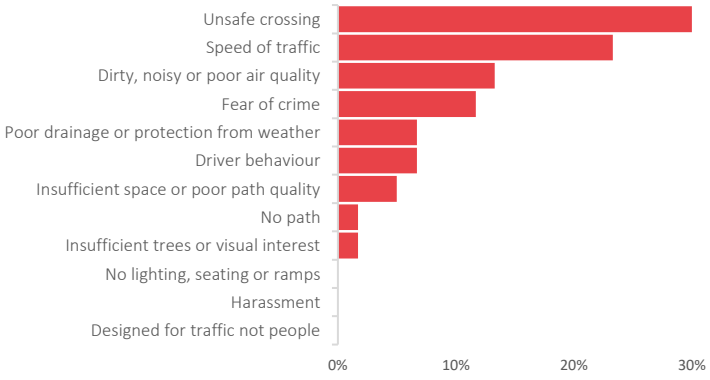


Figure 42. FAWE Girls School, experiences and determinants.

Relationships between environmental determinants and walking experiences in FAWE Girls School.

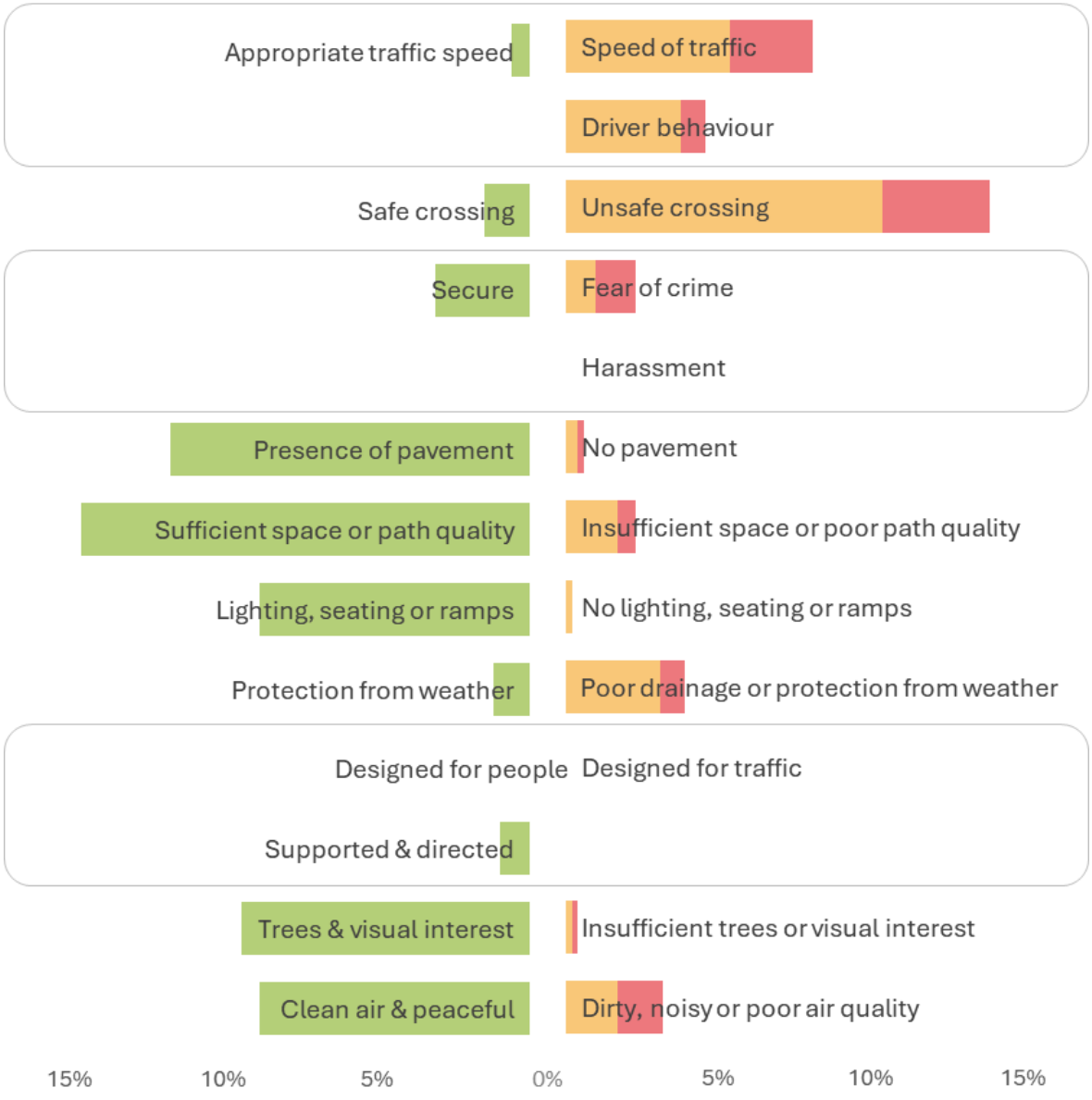


Figure 43. FAWE Girls School, opposing determinants.

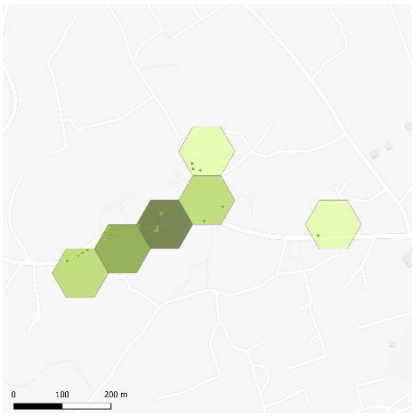
FAWE Girls School - Summary

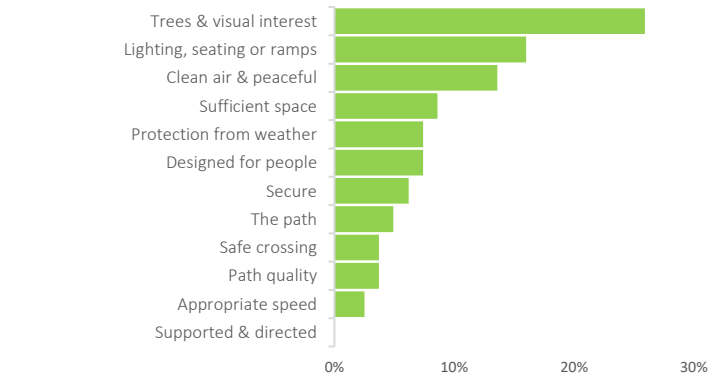
Experience	Environmental Determinant	N	%
Positive	The path	61	11.7
	Trees & visual interest	49	9.4
	Clean air & peaceful	46	8.8
	Lighting, seating or ramps	46	8.8
	Path quality	39	7.5
	Sufficient space	37	7.1
	Secure	16	3.1
	Safe crossing	8	1.5
	Protection from weather	6	1.2
	Supported & directed	5	1
	Appropriate traffic speed	3	0.6
	Designed for people	0	0
Concerns	Unsafe crossing	54	10.4
	Speed of traffic	28	5.4
	Driver behaviour	20	3.8
	Poor drainage or protection from weather	16	3.1
	Dirty, noisy or poor air quality	9	1.7
	Insufficient space or poor path quality	9	1.7
	Fear of crime	5	1
	No path	2	0.4
	Insufficient trees or visual interest	1	0.2
	No lighting, seating or ramps	1	0.2
	Designed for traffic not people	0	0
	Harassment	0	0
Negative	Unsafe crossing	18	3.5
	Speed of traffic	14	2.7
	Dirty, noisy or poor air quality	8	1.5
	Fear of crime	7	1.3
	Driver behaviour	4	0.8
	Poor drainage or protection from weather	4	0.8
	Insufficient space or poor path quality	3	0.6
	Insufficient trees or visual interest	1	0.2
	No path	1	0.2
	Designed for traffic not people	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
	TOTAL	521	100

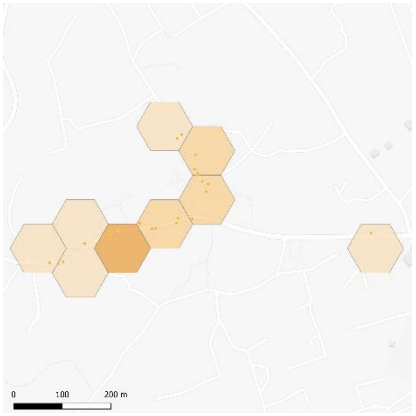
Table 15. FAWE Girls School, summary.

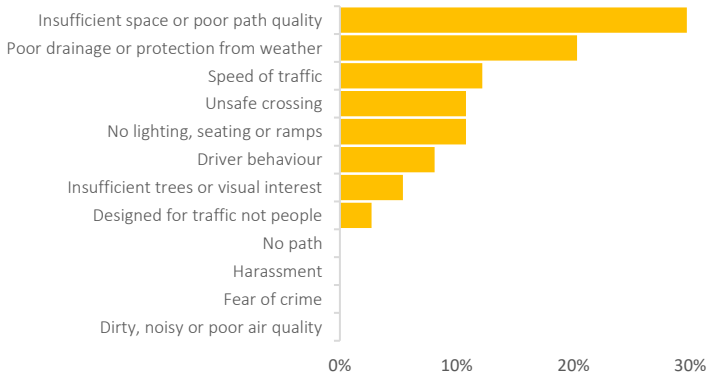
Study area 11: Saint Dominic Primary School

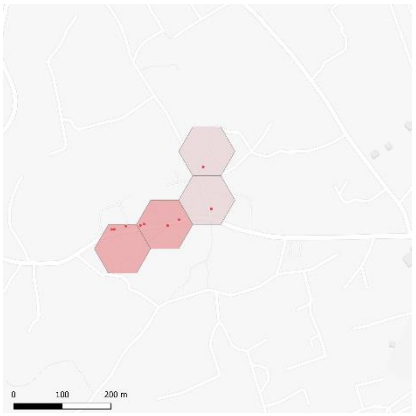
In Saint Dominic Primary School, most of the walking experiences were positive (43.7%) and related to 'Trees and visual interest' (25.9%), `Lighting, seating or ramps' (16%) and 'Clean and peaceful' (13.6%). Followed by concerns (42.3%) related to 'Insufficient space or poor path quality' (29.7%), 'Poor protection from weather' (20.3%) and 'Speed of traffic' (12.2%). And finally, negative experiences (14.1%), related to 'No lighting, seating or ramps' (19%), 'Poor protection from weather' (14.3%) and 'Insufficient space or poor path quality' (14.3%).











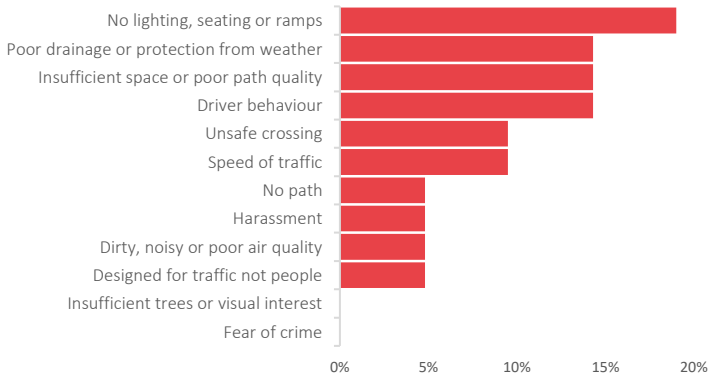


Figure 44. Saint Dominic Primary School, experiences and determinants.

Relationships between environmental determinants and walking experiences in Saint Dominic Primary School.

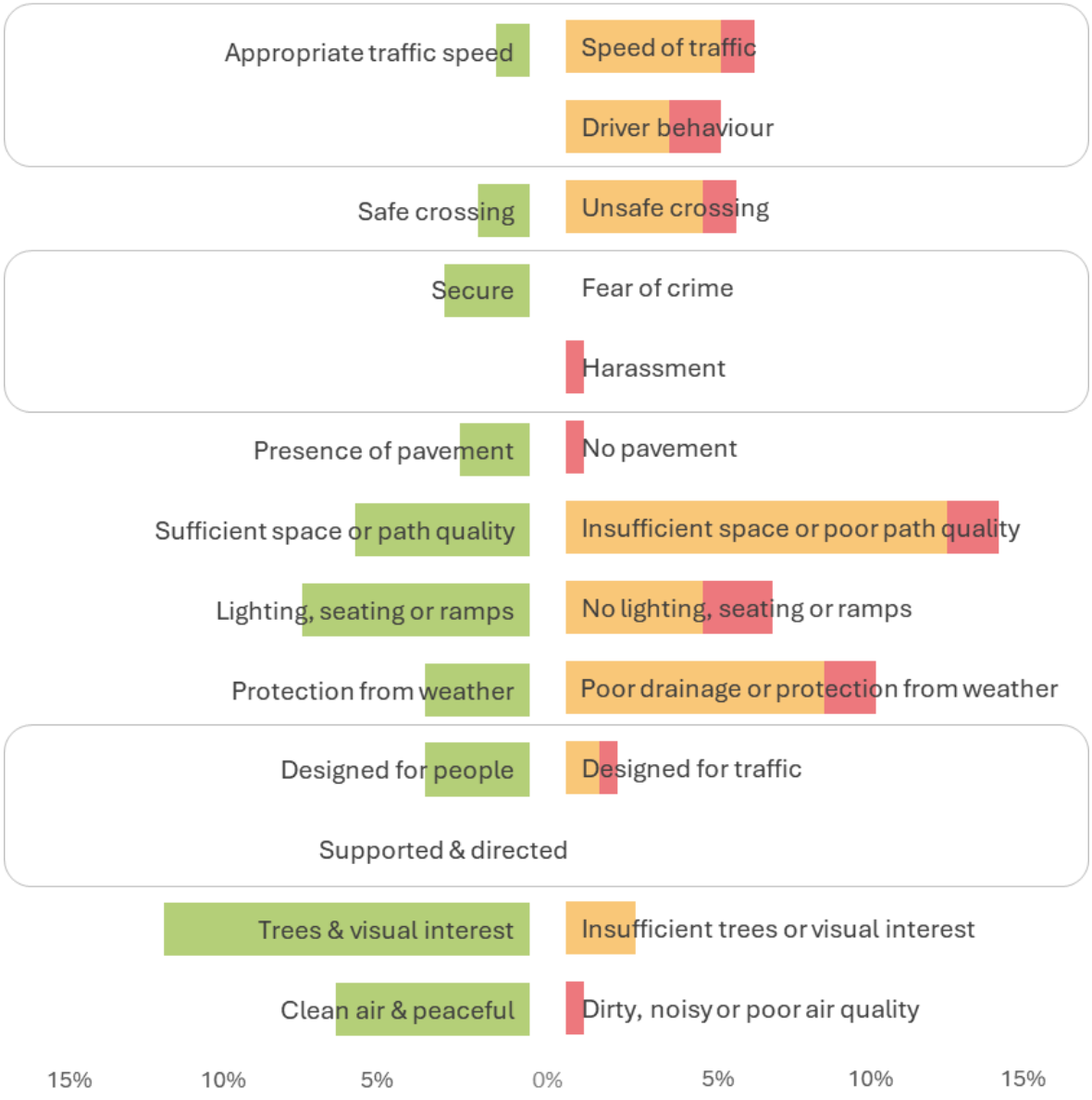


Figure 45. Saint Dominic Primary School, opposing determinants.

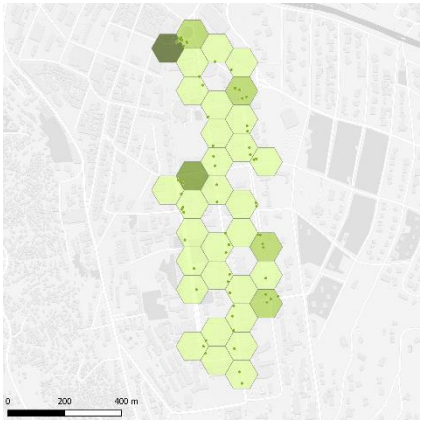
Saint Dominic Primary School - Summary

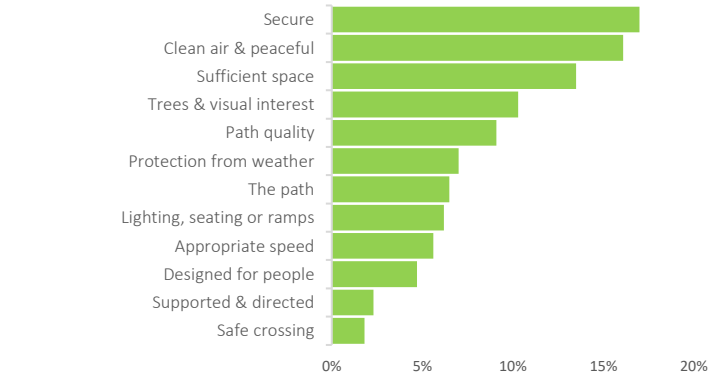
Experience	Environmental Determinant	N	%
Positive	Trees & visual interest	21	11.9
	Lighting, seating or ramps	13	7.4
	Clean air & peaceful	11	6.3
	Sufficient space	7	4
	Designed for people	6	3.4
	Protection from weather	6	3.4
	Secure	5	2.8
	The path	4	2.3
	Path quality	3	1.7
	Safe crossing	3	1.7
	Appropriate traffic speed	2	1.1
	Supported & directed	0	0
Concerns	Insufficient space or poor path quality	22	12.5
	Poor drainage or protection from weather	15	8.5
	Speed of traffic	9	5.1
	No lighting, seating or ramps	8	4.5
	Unsafe crossing	8	4.5
	Driver behaviour	6	3.4
	Insufficient trees or visual interest	4	2.3
	Designed for traffic not people	2	1.1
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	No path	0	0
Negative	No lighting, seating or ramps	4	2.3
	Driver behaviour	3	1.7
	Insufficient space or poor path quality	3	1.7
	Poor drainage or protection from weather	3	1.7
	Speed of traffic	2	1.1
	Unsafe crossing	2	1.1
	Designed for traffic not people	1	0.6
	Dirty, noisy or poor air quality	1	0.6
	Harassment	1	0.6
	No path	1	0.6
	Fear of crime	0	0
	Insufficient trees or visual interest	0	0
	TOTAL	176	100

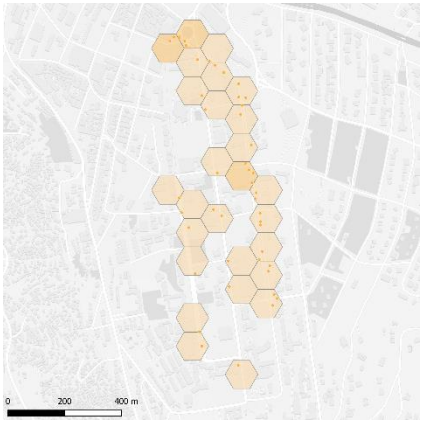
Table 16. Saint Dominic Primary School, summary.

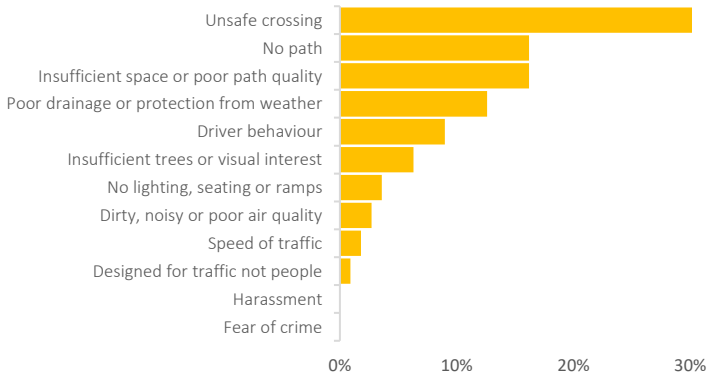
Study area 12: University of Rwanda

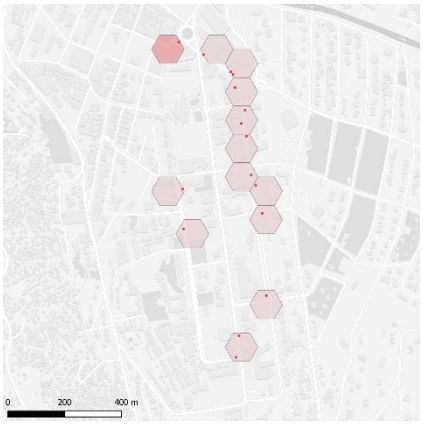
In University of Rwanda, most of the walking experiences were positive (50.4%) and related to 'Secure' (17%), `Cleaning and peaceful' (16.1%) and 'Sufficient space' (13.5%). Followed by concerns (37%) related to 'Unsafe crossing' (30.6%), 'No footpath' (16.2%) and 'Insufficient space or poor path quality' (16.2%). And finally, negative experiences (12.6%), related to 'Unsafe crossing' (26.2%), 'No footpath' (23.8%) and 'Poor protection from weather' (14.3%).











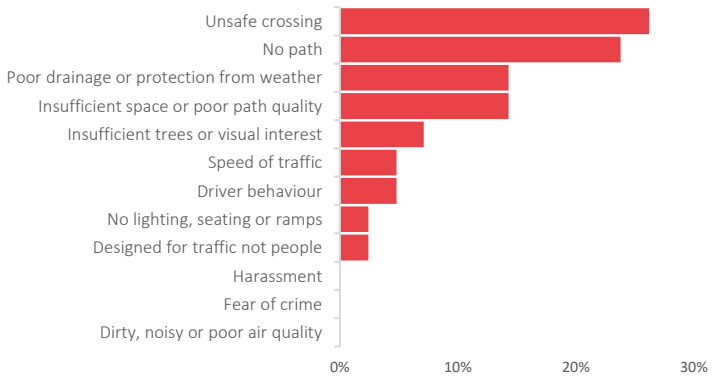


Figure 46. University of Rwanda, experiences and determinants.

Relationships between environmental determinants and walking experiences in University of Rwanda.

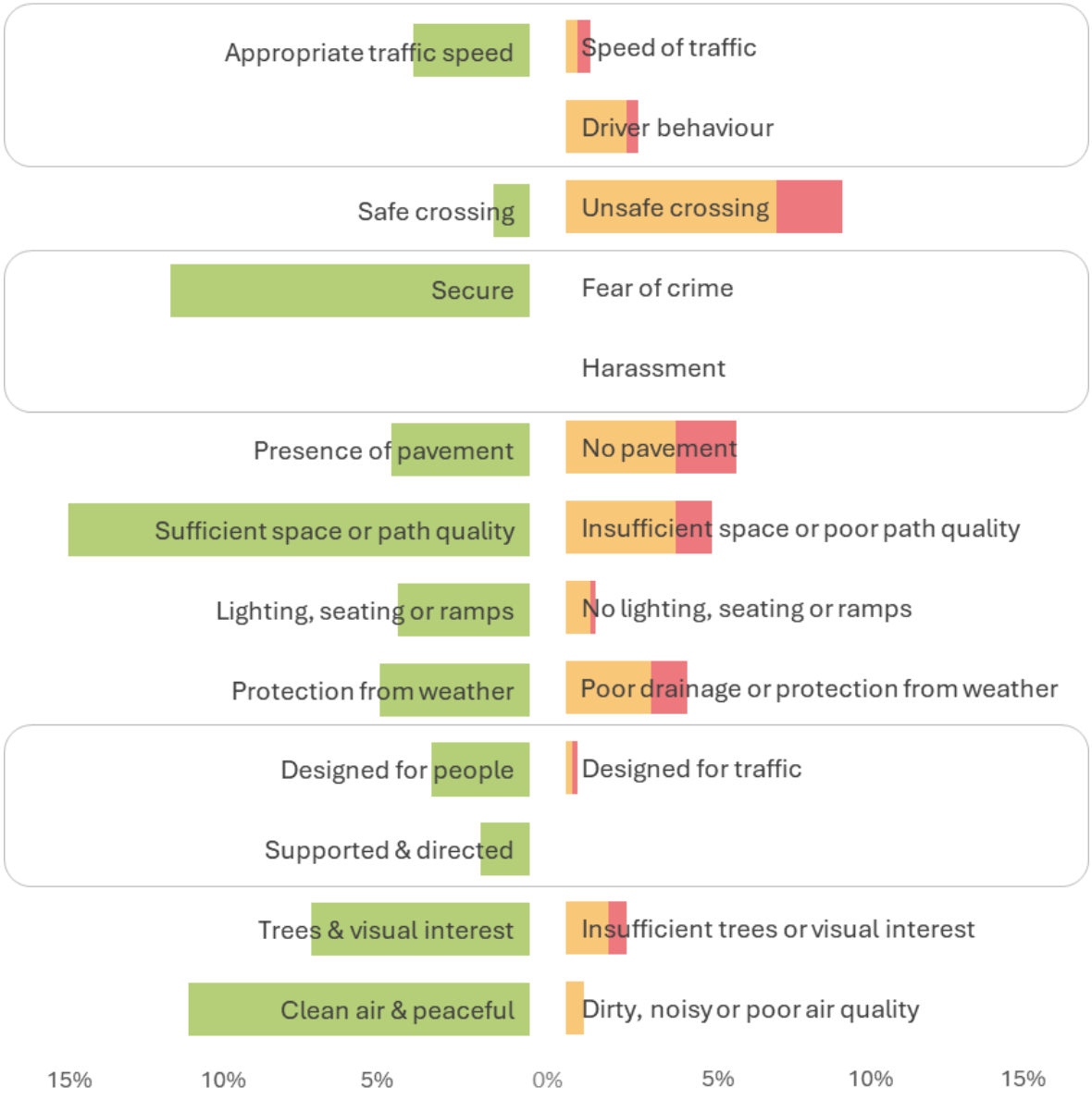


Figure 47. University of Rwanda, opposing determinants.

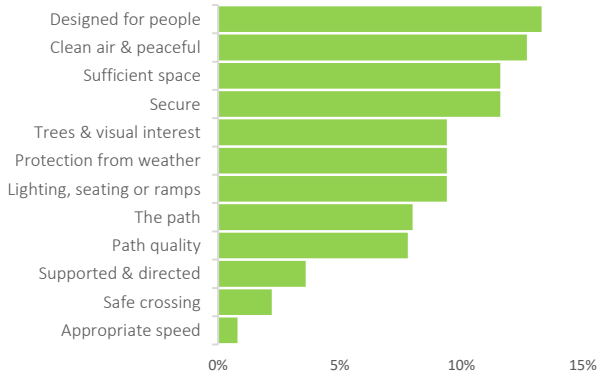
University of Rwanda - Summary

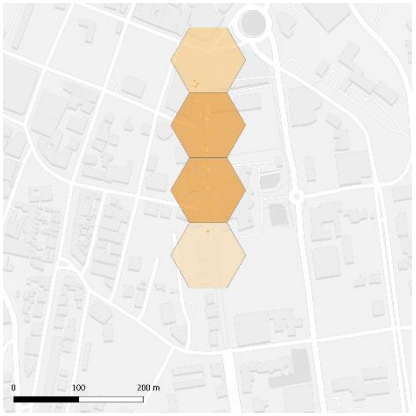
Experience	Environmental Determinant	N	%
Positive	Secure	58	11.7
	Clean air & peaceful	55	11.1
	Sufficient space	46	9.3
	Trees & visual interest	35	7.1
	Path quality	31	6.3
	Protection from weather	24	4.9
	The path	22	4.5
	Lighting, seating or ramps	21	4.3
	Appropriate traffic speed	19	3.8
	Designed for people	16	3.2
	Supported & directed	8	1.6
	Safe crossing	6	1.2
Concerns	Unsafe crossing	34	6.9
	Insufficient space or poor path quality	18	3.6
	No path	18	3.6
	Poor drainage or protection from weather	14	2.8
	Driver behaviour	10	2
	Insufficient trees or visual interest	7	1.4
	No lighting, seating or ramps	4	0.8
	Dirty, noisy or poor air quality	3	0.6
	Speed of traffic	2	0.4
	Designed for traffic not people	1	0.2
	Fear of crime	0	0
	Harassment	0	0
Negative	Unsafe crossing	11	2.2
	No path	10	2
	Insufficient space or poor path quality	6	1.2
	Poor drainage or protection from weather	6	1.2
	Insufficient trees or visual interest	3	0.6
	Driver behaviour	2	0.4
	Speed of traffic	2	0.4
	Designed for traffic not people	1	0.2
	No lighting, seating or ramps	1	0.2
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	TOTAL	494	100

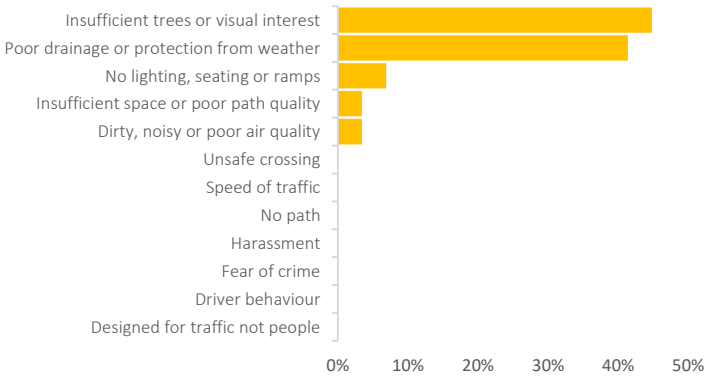
Table 17. University of Rwanda, summary.

Study area 13: KN 4 Avenue – Pedestrianised area

In KN 4 Avenue - Pedestrianised area, most of the walking experiences were positive (64.6%) and related to 'Designed for people' (13.3%), `Clean and peaceful' (12.7%) and 'Sufficient space' (11.6%). Followed by concerns (23.2%) related to 'Insufficient space or poor path quality' (44.8%), 'Poor protection from weather' (41.4%) and 'No lighting, seating or ramps' (6.9%). And finally, negative experiences (12.2%), related to 'Insufficient space or poor path quality' (42.1%), 'Poor protection from weather' (36.8%) and 'No lighting, seating or ramps' (15.8%).







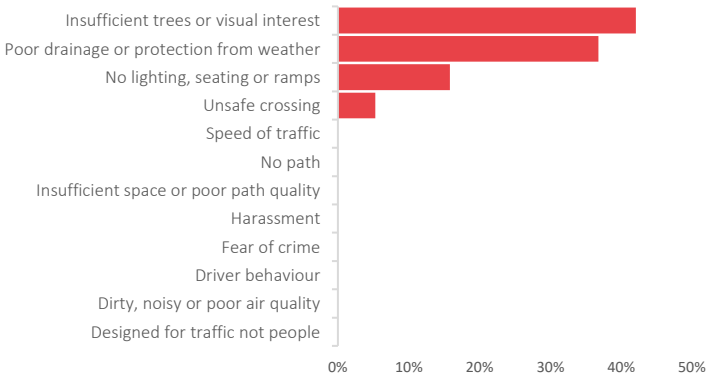


Figure 48. KN 4 Avenue – Pedestrianised area, experiences and determinants.

Relationships between environmental determinants and walking experiences in KN 4 Avenue – Pedestrianised area.

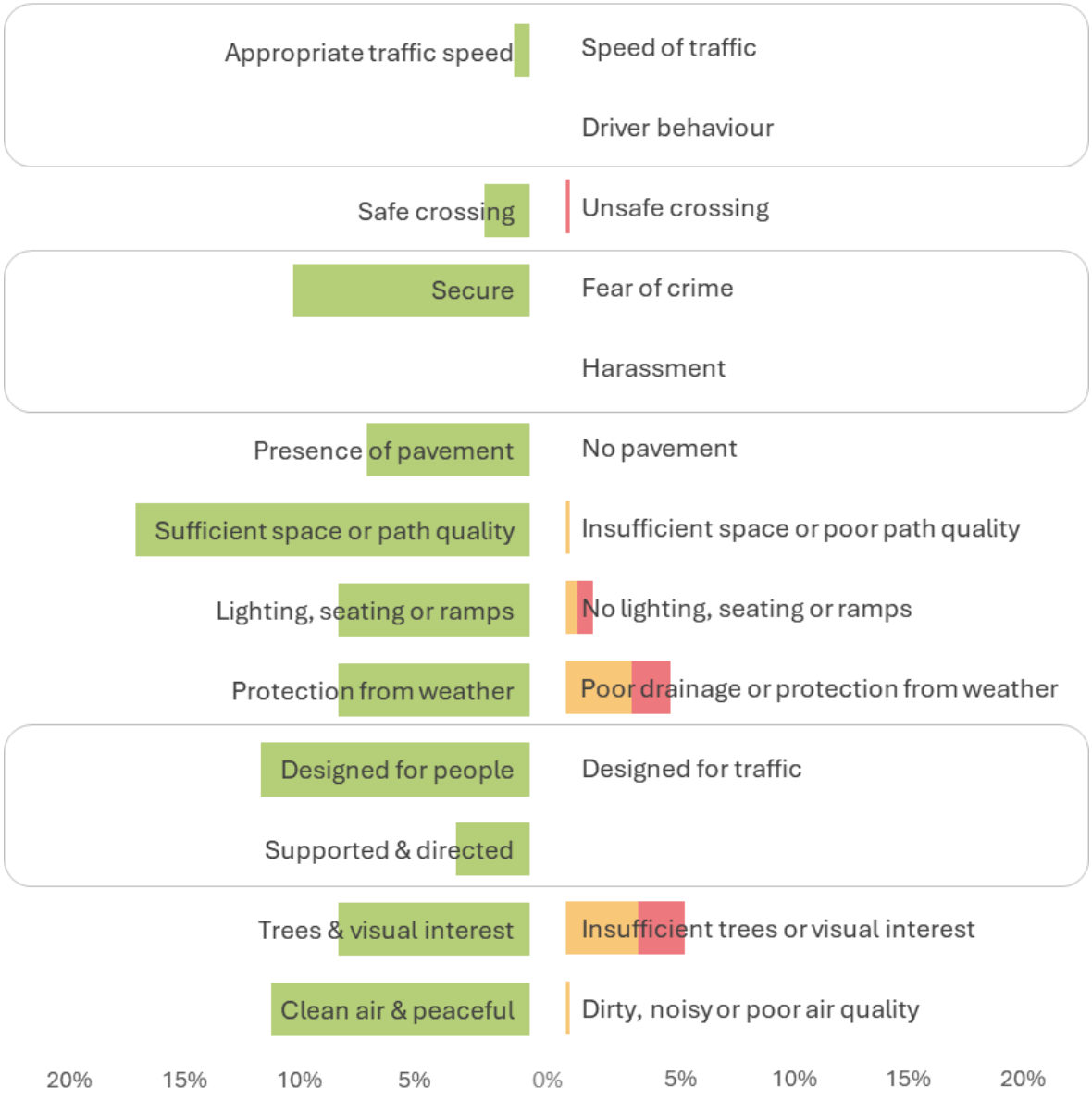


Figure 49. KN 4 Avenue – Pedestrianised area, opposing determinants.

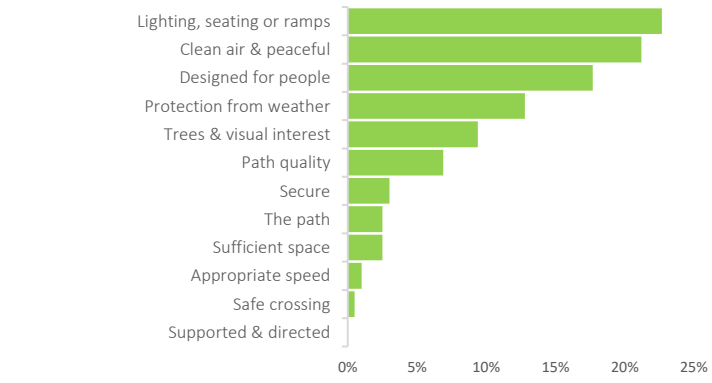
KN 4 Avenue, Pedestrianised area - Summary

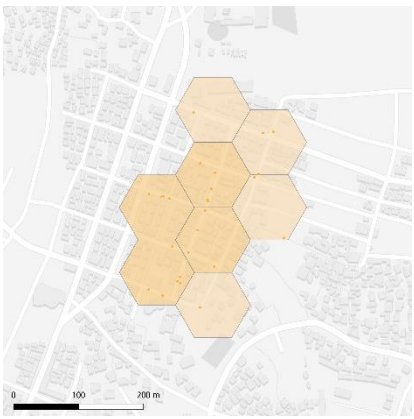
Experience	Environmental Determinant	N	%
Positive	Designed for people	48	11.7
	Clean air & peaceful	46	11.2
	Secure	42	10.3
	Sufficient space	42	10.3
	Lighting, seating or ramps	34	8.3
	Protection from weather	34	8.3
	Trees & visual interest	34	8.3
	The path	29	7.1
	Path quality	28	6.8
	Supported & directed	13	3.2
	Safe crossing	8	2
	Appropriate traffic speed	3	0.7
Concerns	Insufficient trees or visual interest	13	3.2
	Poor drainage or protection from weather	12	2.9
	No lighting, seating or ramps	2	0.5
	Dirty, noisy or poor air quality	1	0.2
	Insufficient space or poor path quality	1	0.2
	Designed for traffic not people	0	0
	Driver behaviour	0	0
	Fear of crime	0	0
	Harassment	0	0
	No path	0	0
	Speed of traffic	0	0
	Unsafe crossing	0	0
Negative	Insufficient trees or visual interest	8	2
	Poor drainage or protection from weather	7	1.7
	No lighting, seating or ramps	3	0.7
	Unsafe crossing	1	0.2
	Designed for traffic not people	0	0
	Dirty, noisy or poor air quality	0	0
	Driver behaviour	0	0
	Fear of crime	0	0
	Harassment	0	0
	Insufficient space or poor path quality	0	0
	No path	0	0
	Speed of traffic	0	0
	TOTAL	409	100

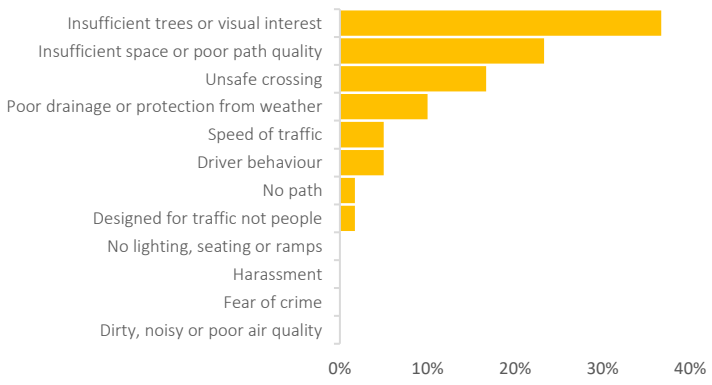
Table 18. KN 4 Avenue – Pedestrianised area, summary.

Study area 14: Biryogo Car Free Food Street

In Biryogo Car Free Food Street, most of the walking experiences were positive (57.8%) and related to 'Lighting, seating or ramps' (22.7%), `Clean air and peaceful' (21.2%) and 'Designed for people' (17.7%). Followed by concerns (32.5%) related to 'Insufficient trees or visual interest' (36.7%), 'Insufficient space or poor path quality' (23.3%) and 'Unsafe crossing' (16.7%). And finally, negative experiences (9.6%), related to 'Insufficient trees or visual interest' (41.2%), 'Unsafe crossing' (23.5%) and 'Insufficient space or poor path quality' (11.8%).







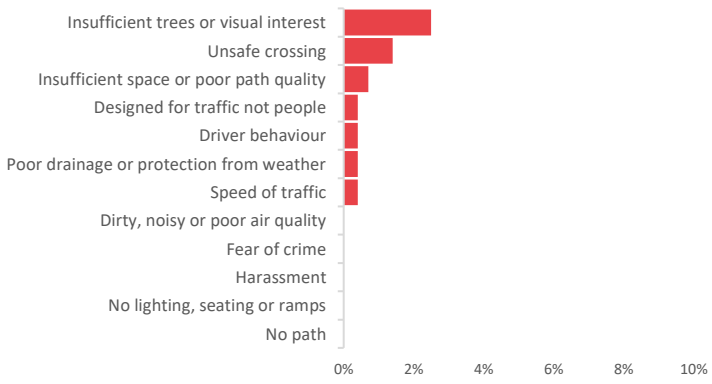


Figure 50. Biryogo Car Free Food Street, experiences and determinants.

Relationships between environmental determinants and walking experiences in Biryogo Car Free Food Street.

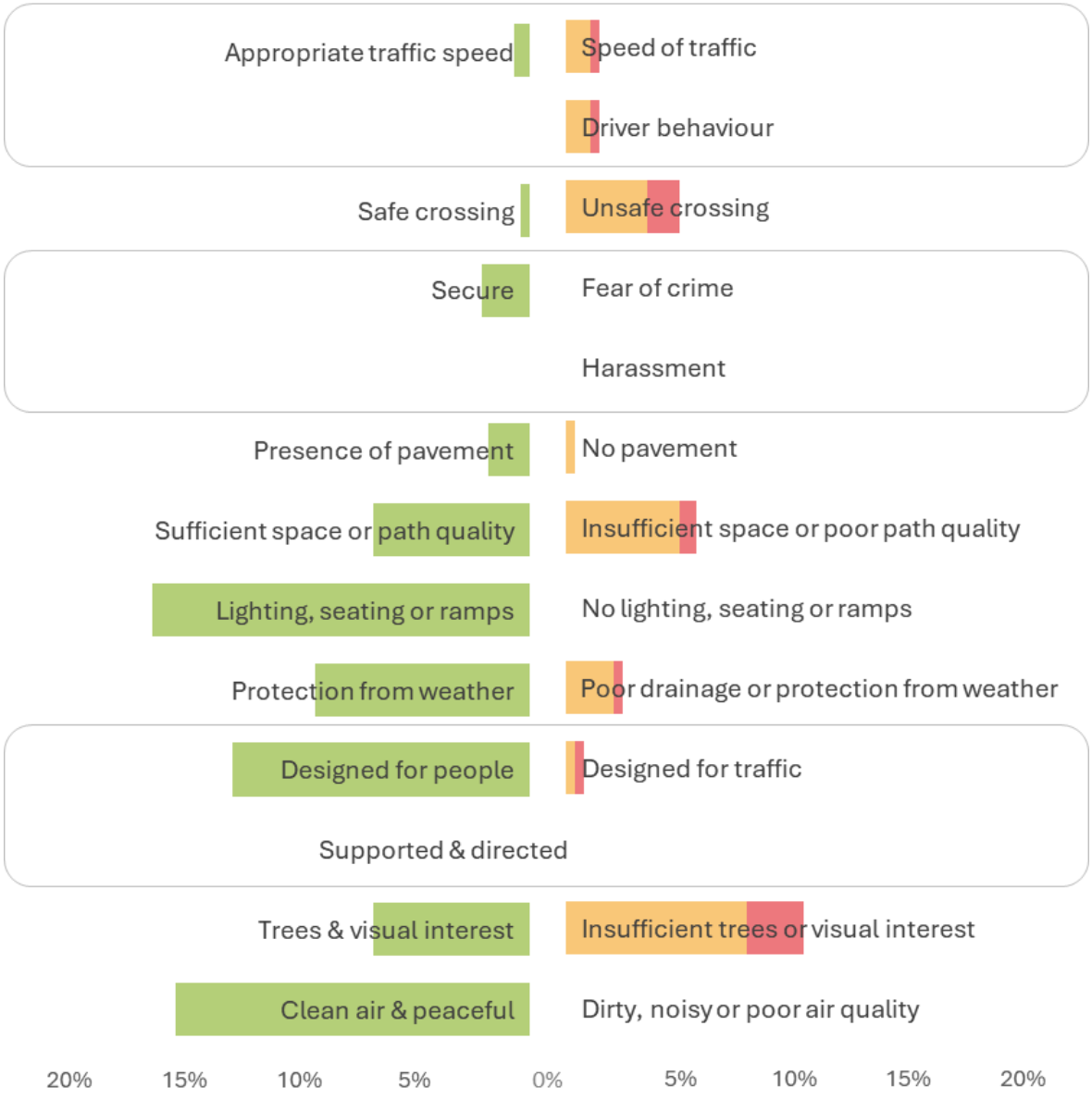


Figure 51. Biryogo Car Free Food Street, opposing determinants.

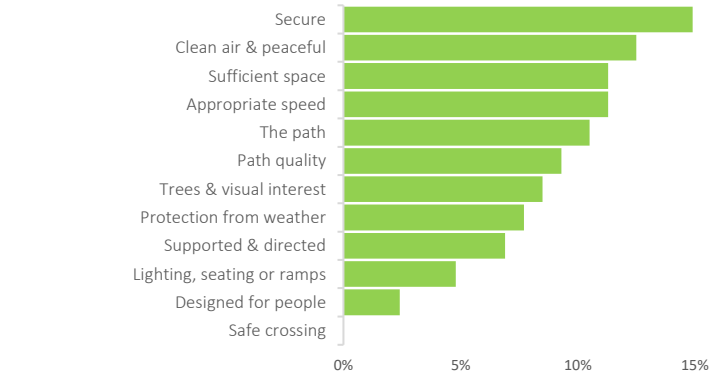
Biryogo Car Free Food Street - Summary

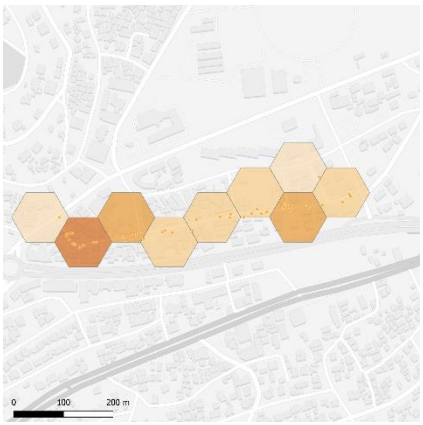
Experience	Environmental Determinant	N	%
Positive	Lighting, seating or ramps	46	16.4
	Clean air & peaceful	43	15.4
	Designed for people	36	12.9
	Protection from weather	26	9.3
	Trees & visual interest	19	6.8
	Path quality	14	5
	Secure	6	2.1
	Sufficient space	5	1.8
	The path	5	1.8
	Appropriate traffic speed	2	0.7
	Safe crossing	1	0.4
	Supported & directed	0	0
Concerns	Insufficient trees or visual interest	22	7.9
	Insufficient space or poor path quality	14	5
	Unsafe crossing	10	3.6
	Poor drainage or protection from weather	6	2.1
	Driver behaviour	3	1.1
	Speed of traffic	3	1.1
	Designed for traffic not people	1	0.4
	No path	1	0.4
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
Negative	Insufficient trees or visual interest	7	2.5
	Unsafe crossing	4	1.4
	Insufficient space or poor path quality	2	0.7
	Designed for traffic not people	1	0.4
	Driver behaviour	1	0.4
	Poor drainage or protection from weather	1	0.4
	Speed of traffic	1	0.4
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
	No path	0	0
	TOTAL	280	100

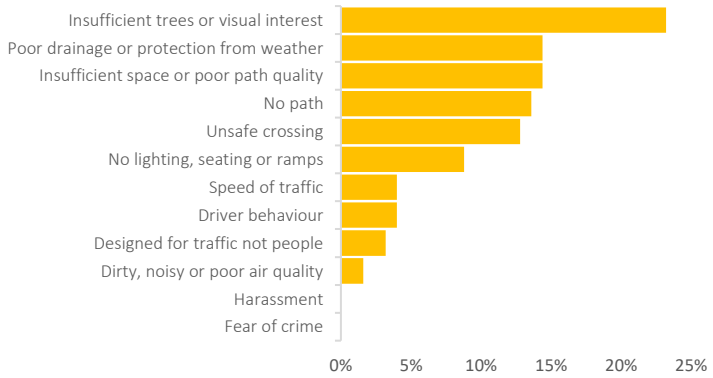
Table 19. Biryogo Car Free Food Street, summary.

Study area 15: Remera Gisimenti Car Free Zone

In Remera Gisimenti Car Free Zone, most of the walking experiences were concerns (45.6%) and related to 'Insufficient trees or visual interest' (23.2%), `Poor protection from weather' (14.4%) and 'Insufficient space or poor path quality' (14.4%). Followed by positive experiences (36.9%) related to 'Secure' (14.9%), 'Clean air and peaceful' (12.5%) and 'Sufficient space' (11.3%). And finally, negative experiences (17.5%), related to 'No footpath' (26.8%), 'Unsafe crossing' (21.4%) and 'Poor protection from weather' (17.9%).







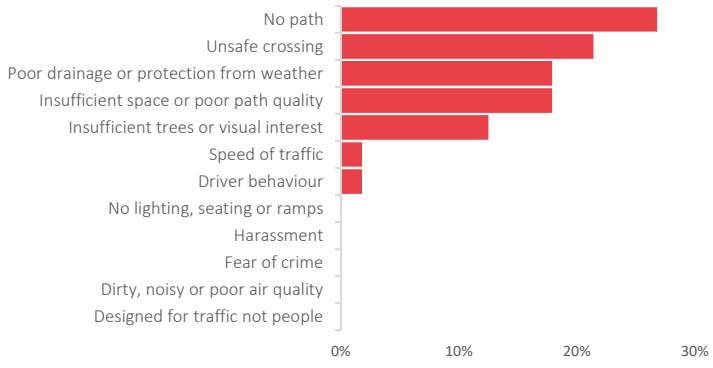


Figure 52. Remera Gisimenti Car Free Zone, experiences and determinants.

Relationships between environmental determinants and walking experiences in Remera Gisimenti Car Free Zone.

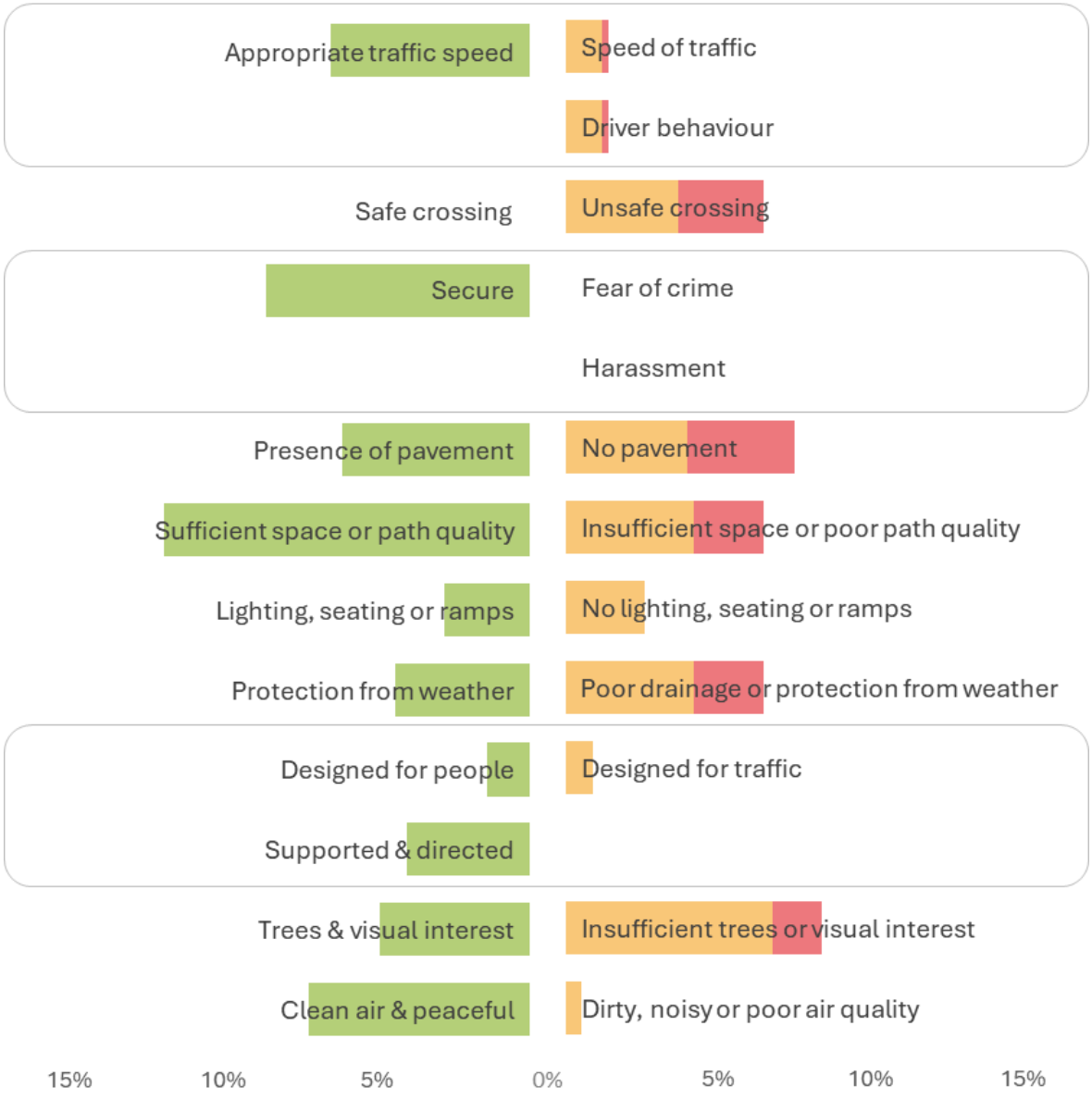


Figure 53. Remera Gisimenti Car Free Zone, opposing determinants.

Remera Gisimenti Car Free Zone - Summary

Experience	Environmental Determinant	N	%
Positive	Secure	37	8.6
	Clean air & peaceful	31	7.2
	Appropriate traffic speed	28	6.5
	Sufficient space	28	6.5
	The path	26	6.1
	Path quality	23	5.4
	Trees & visual interest	21	4.9
	Protection from weather	19	4.4
	Supported & directed	17	4
	Lighting, seating or ramps	12	2.8
	Designed for people	6	1.4
	Safe crossing	0	0
Concerns	Insufficient trees or visual interest	29	6.8
	Insufficient space or poor path quality	18	4.2
	Poor drainage or protection from weather	18	4.2
	No path	17	4
	Unsafe crossing	16	3.7
	No lighting, seating or ramps	11	2.6
	Driver behaviour	5	1.2
	Speed of traffic	5	1.2
	Designed for traffic not people	4	0.9
	Dirty, noisy or poor air quality	2	0.5
	Fear of crime	0	0
	Harassment	0	0
Negative	No path	15	3.5
	Unsafe crossing	12	2.8
	Insufficient space or poor path quality	10	2.3
	Poor drainage or protection from weather	10	2.3
	Insufficient trees or visual interest	7	1.6
	Driver behaviour	1	0.2
	Speed of traffic	1	0.2
	Designed for traffic not people	0	0
	Dirty, noisy or poor air quality	0	0
	Fear of crime	0	0
	Harassment	0	0
	No lighting, seating or ramps	0	0
	TOTAL	429	100

Table 20. Remera Gisimenti Car Free Zone, summary.

3.7. Walking environmental determinants in Kigali, by study area

Path space and quality

Path space and quality was the most frequent determinant (17.1%) related to walking experiences, with 9.4% related to positive experiences. However, 4.6% experiences were related to concerns and 3.1% to negative experiences due to insufficient space or poor path quality. By study area, there were ten areas with more positive experiences: KN 4 Ave (17.1%), University (15.6%), FAWE (14.6%), Muhima (14.4%), Kicukiro (13.7%), Remera car-free (12.6%), St Michel Nyarugenge (8.1%), Biryogo car-free (6.8%) and Biryogo School (4.2%). There were four study areas with more concerns: Saint Dominic (12.5%), Glory (8.3%), St. Joseph Le Travailleur (7.5%) and Ntwali (7.1%). Finally, there was one study area with more negative experiences: Kabusunzu (8%).

Places to learn from	KN 4 Ave, Remera, University, FAWE, Muhima, Kicukiro, St Michel Nyarugenge and Biryogo.
Places to improve	Kabusunzu, Saint Dominic, Glory, St. Joseph Le Travailleur and Ntwali.

Figure 54. Experiences on Path space and quality, by study area.

Pedestrian crossing

Pedestrian crossing was the second most frequent determinant (11.3%) related to walking experiences in Kigali, with 5.6% related to concerns and 4% to negative experiences due to unsafe crossings. Whereas 1.7% positive experiences were related to safe crossings. By study area, there were eleven areas with more concerns related to unsafe crossings: FAWE (10.4%), St. Joseph Le Travailleur (8.9%), Camp Kigali (8.2%), Muhima (7.1%), Biryogo (6.9%), Glory (6.9%), University (6.9%). Ntwali (5.6%), Saint Dominic (4.5%), Remera car-free (3.7%) and Biryogo car-free (3.6%). There were three areas with more negative experiences related to unsafe crossings: Kabusunzu (7.9%), St Michel Nyarugenge (7.8%) and Kicukiro (5.1%). There was one area with more positive experiences related to safe crossings: KN 4 Avenue car-free (2%).

Places to learn from	KN 4 Ave
Places to improve	Camp Kigali, St Michel Nyarugenge, Ntwali, Le Travailleur, Biryogo, Kabusunzu, Kicukiro, Glory, FAWE, Saint Dominic, University, Muhima

Figure 55. Experiences on Pedestrian crossing, by study area.

Protection from weather

Protection from weather was the third most frequent determinant (10.6%) related to walking experiences in Kigali, with 4.3% related to concerns and 3.6% to negative experiences related to poor or no protection from weather. Whereas 2.7% were positive experiences due to good protection from weather. By study area, there were seven areas with more concerns: St. Joseph Le Travailleur (10.4%), Saint Dominic (8.5%), Camp Kigali (7.6%), Glory (6.6%), Ntwali (5.4%), Muhima (3.2%) and FAWE (3.1%). There were four areas with more negative experiences: Biryogo (8.2%), Kabusunzu (7.9%), Kicukiro (7.1%) and St Michel Nyarugenge (2.7%). Finally, there were four areas with more positive experiences: Biryogo car-free (9.3%), KN 4 Avenue car-free (8.3%), University (4.9%) and Remera car-free (4.4%).

Places to learn from	Biryogo car-free, KN 4 Avenue car-free, University, Remera car-free
Places to improve	Biryogo, Kabusunzu, Kicukiro, St Michel Nyarugenge, St. Joseph Le Travailleur, Saint Dominic, Camp Kigali, Glory, Ntwali, Muhima and FAWE

Figure 56. Experiences on Protection from weather, by study area.

Trees and visual interest

Trees and visual interest were the fourth most frequent determinant (10.2%) related to walking experiences in Kigali, with 4.6% related to positive experiences, 3.3. to concerns and 2.3% to negative experiences due to insufficient trees or visual interest. By study area, there were six areas with more positive experiences St Dominic (11.9%), FAWE (9.4%), KN 4 Ave (8.3%), University (7.1%), Camp Kigali (5.8%) and St Michel Nyarugenge (4.3%). There were five areas with more concerns: Biryogo car-free (7.9%), Remera car-free (6.8%), Glory (6.6%), Muhima (5.5%) and Ntwali (5%). In the case of Kicukiro, there were as many positive experiences as negative ones (5.5%). Finally, there were three areas with more negative experiences: Kabusunzu (7.7%), Biryogo (3.3%) and St. Joseph Le Travailleur (2.6%).

Places to learn from	Saint Dominic, FAWE, KN 4 Ave, University, Camp Kigali and St Michel Nyarugenge.
Places to improve	Kabusunzu, Biryogo, St. Joseph Le Travailleur, Glory, Muhima, Ntwali, Kicukiro, Biryogo car-free and Remera car-free.

Figure 57. Experiences on Trees and visual interest, by study area.

Lighting, seating or ramps

Lighting, seating or ramps were the fifth most frequent determinant (9.1%) related to walking experiences in Kigali, with 5.2% related to positive experiences. However, 2.2% were related to concerns and 1.7% to negative experiences due to poor or lack of lighting, seating or ramps. By study area, there were nine areas with more positive experiences: Biryogo car-free (16.4%), FAWE (8.8%), Kicukiro (8.6%), KN 4 Ave (8.3%), Saint Dominic (7.4%), Muhima (6.9%), Glory (4.2%), St Michel Nyarugenge (3%) and Remera car-free (2.8%). However, there were two areas with more concerns: St. Joseph Le Travailleur (6.1%) and Ntwali (5.6%), while Camp Kigali had as many positive as negative experiences (2.3%). Finally, there was one area with more negative experiences: Kabusunzu (5.6%).

Places to learn from	Biryogo car-free, FAWE, Kicukiro, KN 4 Ave, Saint Dominic, Muhima, Glory, St Michel Nyarugenge and Remera car-free.
Places to improve	Kabusunzu, St. Joseph Le Travailleur, Ntwali and Camp Kigali.

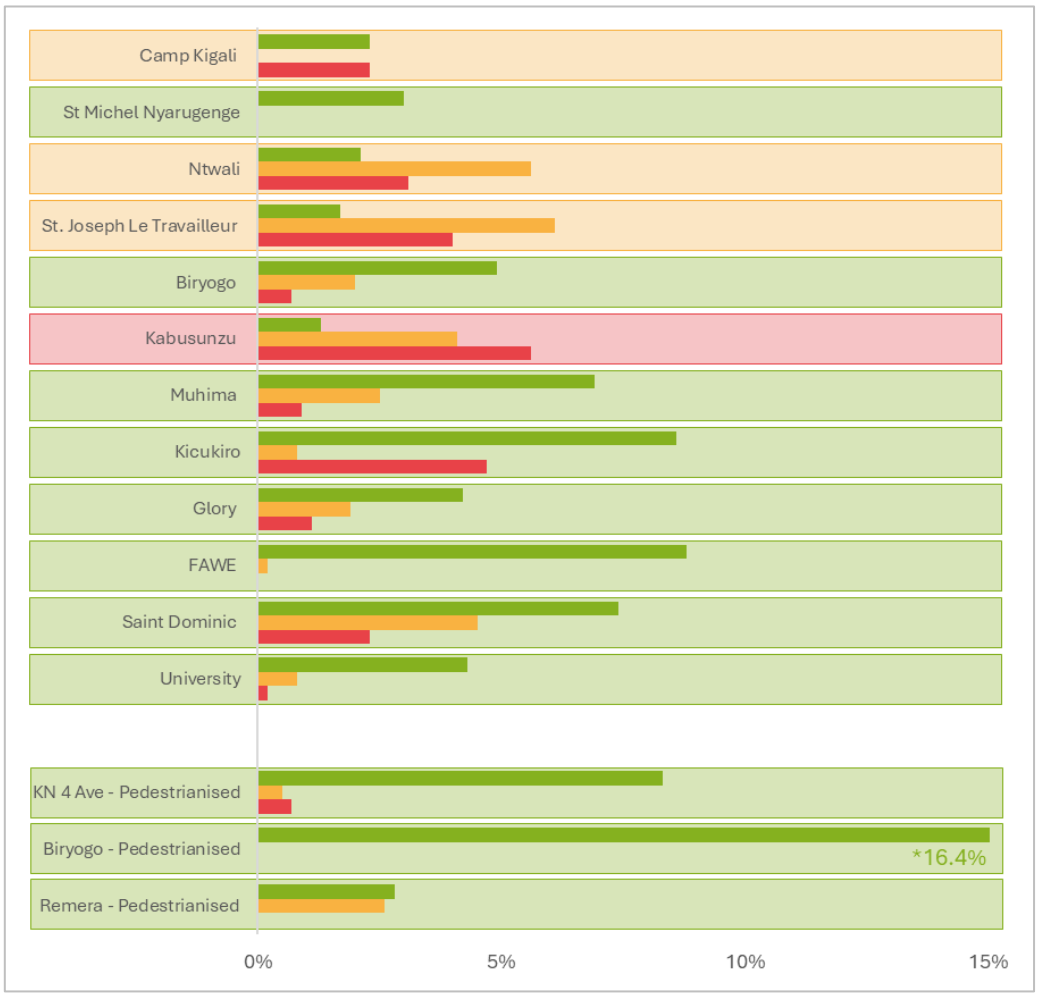


Figure 58. Experiences on Lighting, seating or ramps, by study area.

Presence or absence of footpath

The presence or absence or footpath was the sixth most frequent determinant (8.6%) related to walking experiences in Kigali, with 3.7% related to positive experiences, but also 2.8% negative experiences and 2.1% concerns due to absence of footpath. Y study areas, there were five areas with more positive experiences: FAWE (11.7%), Muhima (5.3%), Kicukiro (4.3%), University (4.5%) and Saint Dominic (2.3%). However, there were another five areas with more negative experiences: St Michel Nyarugenge (10%), Kabusunzu (7.7%), Ntwali (4%), Biryogo (3%) and Camp Kigali (2.3%). Finally, there were two areas with more concerns: St. Joseph Le Travailleur (6.3%) and Glory (1.9%).

Places to learn from	FAWE, Muhima, Kicukiro, University and Saint Dominic.
Places to improve	St Michel Nyarugenge, Kabusunzu, Ntwali, Biryogo, Camp Kigali, St. Joseph Le Travailleur and Glory.

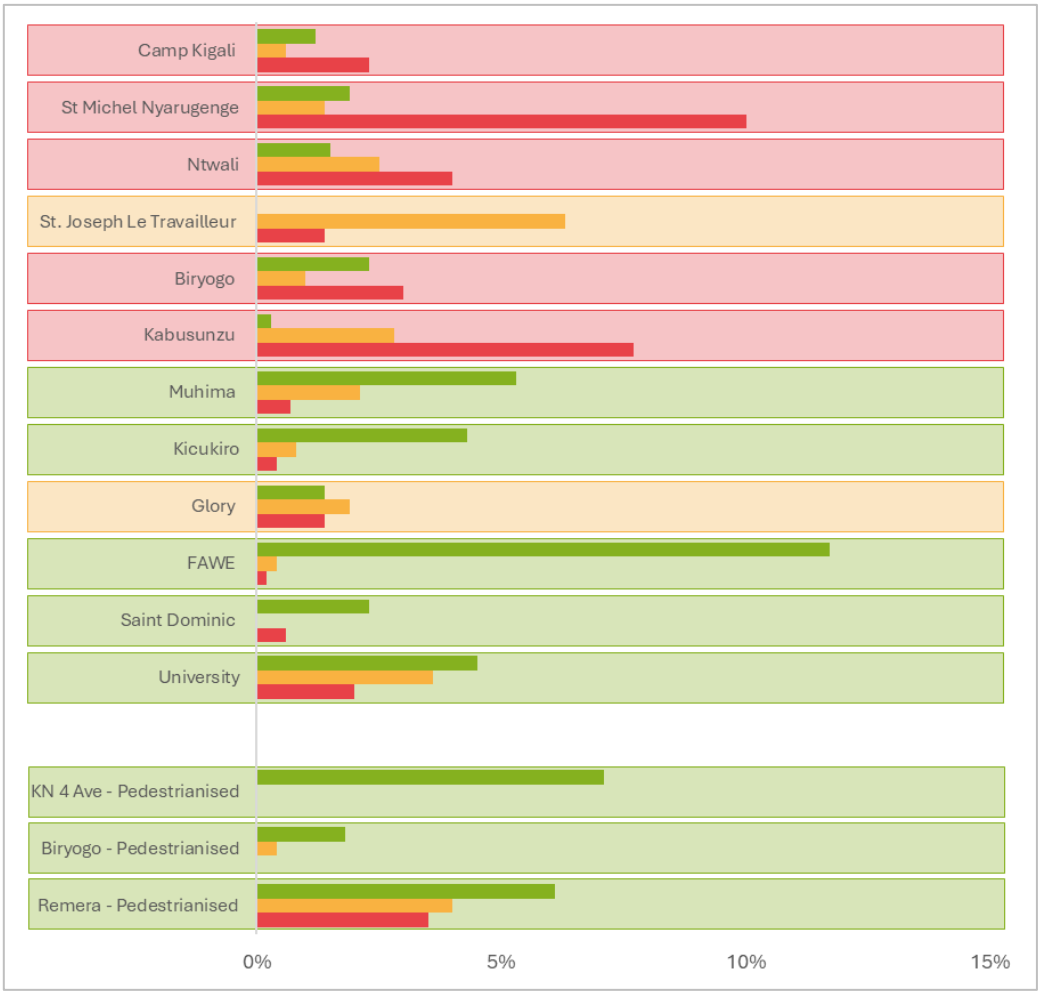


Figure 59. Experiences related to Presence or absence of footpath, by study area.

Environmental quality

Environmental quality was the seventh most frequent determinant (8.6%) related to walking experiences in Kigali, with 6.3% related to positive experiences due to clean and peaceful environments. However, there were 1.2% of concerns and 0.8% negative experiences related to dirty, noisy or poor path quality. By study area, there were twelve areas with more positive experiences: Biryogo car-free (15.4%), KN 4 Ave (11.2%), University (11.1%), St Michel Nyarugenge (9.7%), FAWE (8.8%), Kicukiro (8.2%), Biryogo (7.2%), Remera car-free (7.2%), Saint Dominic (6.3%), Camp Kigali (5.8%), Glory (4.2%) and St. Joseph Le Travailleur (3.2%). However, there were three areas with more concerns: Muhima (2.5%), Ntwali (2.5%) and Kabusunzu (1.6%).

Places to learn from	University, St Michel Nyarugenge, FAWE, Kicukiro, Biryogo, Saint Dominic, Camp Kigali, Glory and St. Joseph Le Travailleur.
Places to improve	Muhima, Ntwali and Kabusunzu.

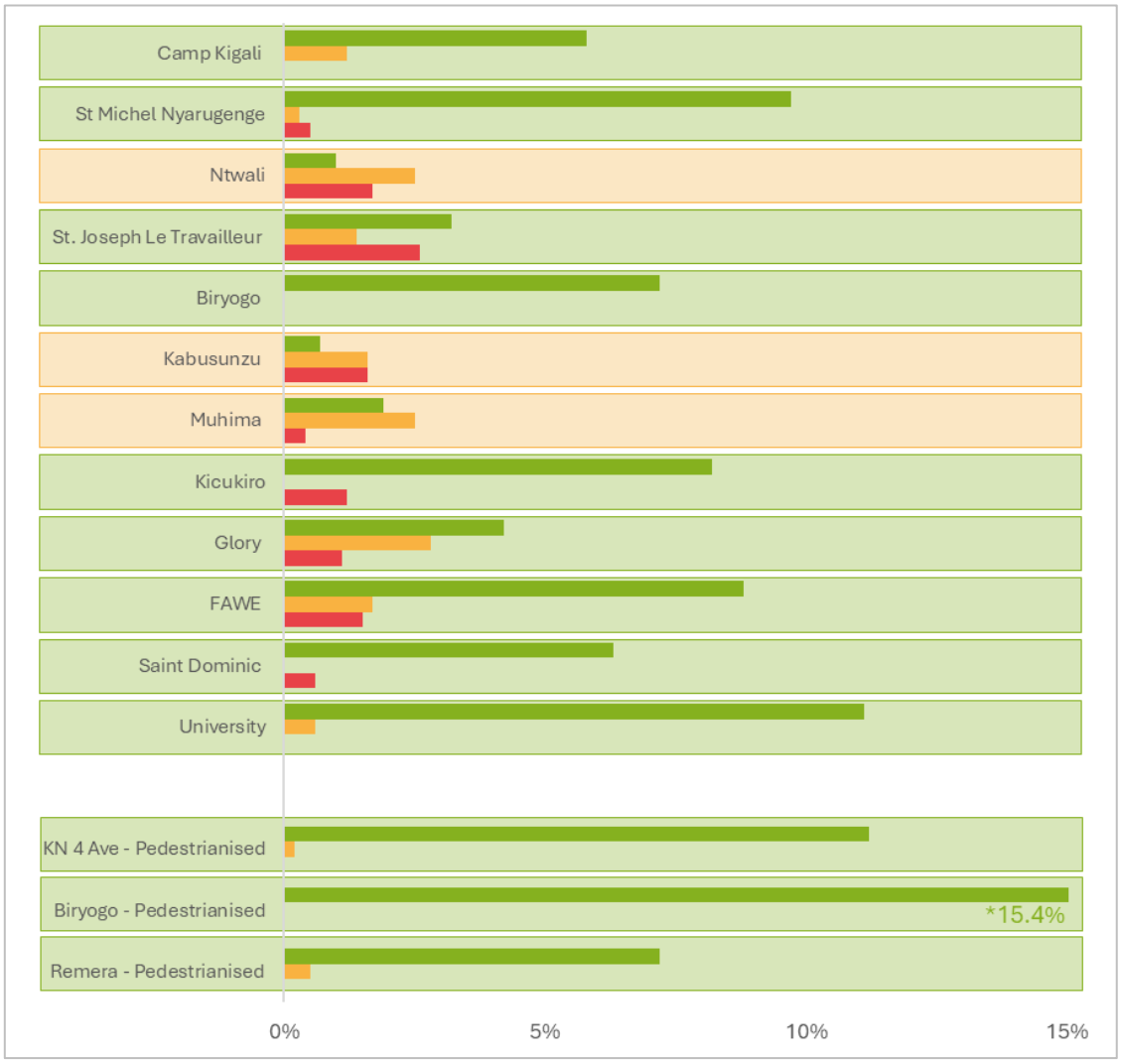


Figure 60. Experiences related to Environmental quality, by study area.

Traffic speed

Traffic speed was the eighth most frequent determinant (7.2%) related to walking experiences in Kigali, with 3.2% related to concerns and 1.7% to negative experiences due to fast traffic. Whereas 2.3% of observations were related to positive experiences due to appropriate traffic speed. By study areas, there were seven areas with more concerns: Glory (7.2%), FAWE (5.4%), Camp Kigali (5.3%), Ntwali (5.2%), Saint Dominic (5.1%), Muhima (4.9%) and St. Joseph Le Travailleur (2.9%). There were three areas with more positive experiences: University (3.8%), St Michel Nyarugenge (2.7%) and Kicukiro (2.7%). Finally, there were two areas with more negative experiences: Kabusunzu (7.9%) and Biryogo (7.5%).

Places to learn from	University, St Michel Nyarugenge and Kicukiro.
Places to improve	Kabusunzu, Biryogo, Glory, FAWE, Camp Kigali, Ntwali, Saint Dominic, Muhima and St. Joseph Le Travailleur.

Figure 61. Experiences related to Traffic speed, by study area.

Personal security

Personal security was the ninth most frequent determinant (6.6%) related to walking experiences in Kigali, with 4.9% related to positive experiences, but also 1.1% observations related to concerns and 0.6% to negative experiences related to fear of crime. By study area, there were twelve areas with more positive experiences: University (11.7%), KN 4 Ave (10.3%), Remera car-free (8.6%), St Michel Nyarugenge (8.4%), Kicukiro (6.3%), Camp Kigali (4.7%), Glory (4.2%), Muhima (3.4%), FAWE (3.1%), Saint Dominic (2.8%), Biryogo car-free (2.1%) and Biryogo School (2%). However, there were two areas with more concerns: Ntwali (4.2%) and Kabusunzu (2.5%). Finally, one area with more negative experiences: St. Joseph Le Travailleur (2.9%).

Places to learn from	KN 4 Ave, University, Remera car-free, St Michel Nyarugenge, Kicukiro, Camp Kigali, Glory, Muhima, FAWE, Saint Dominic, Biryogo car-free and Biryogo School.
Places to improve	St. Joseph Le Travailleur, Ntwali and Kabusunzu.

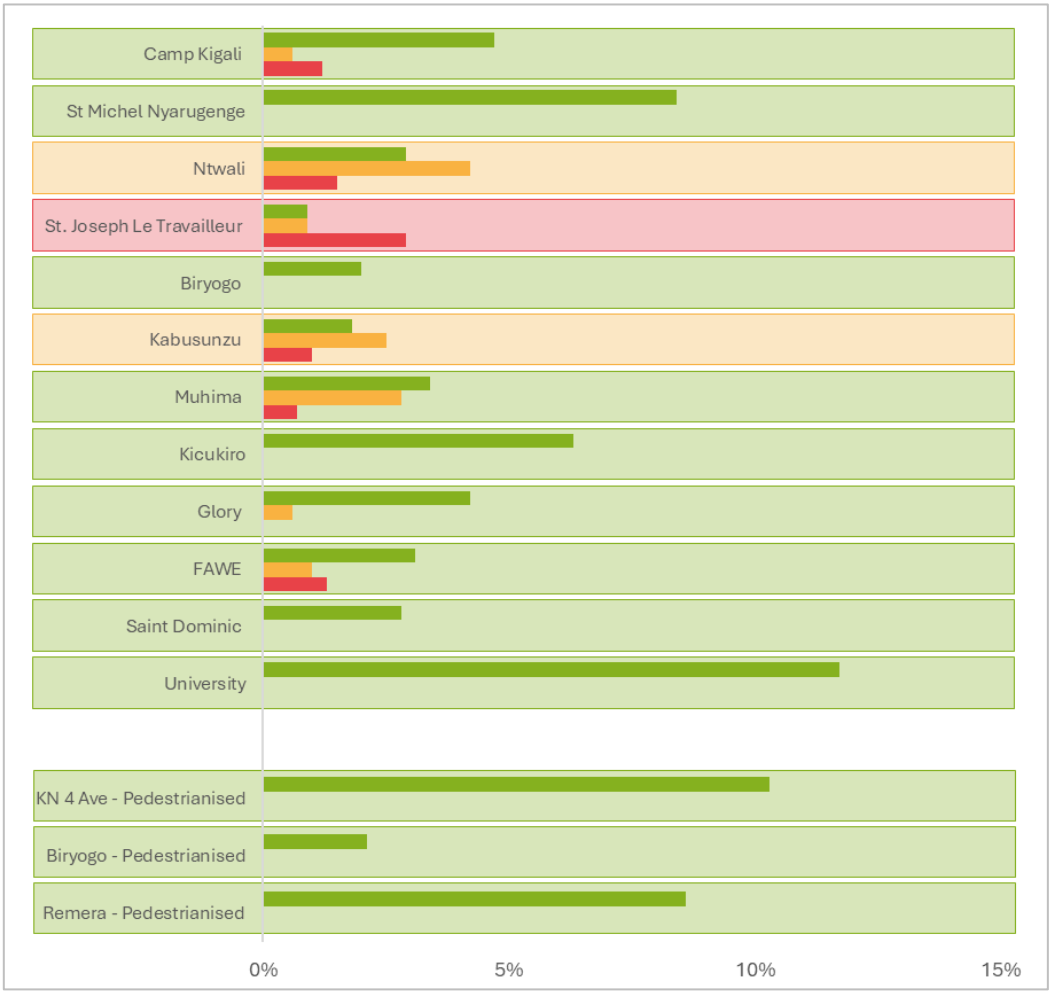


Figure 62. Experiences related to Personal security, by study area.

Car or pedestrian oriented street design

Streets designed for people or traffic were the tenth most frequent determinant (5.1%) related to walking experiences in Kigali, with 2.5% related to positive experiences, 1.3% observations related to both concerns and negative experiences. By study area, there were seven areas with more positive experiences: Biryogo car-free (12.9%), KN 4 Ave (11.7%), Kicukiro (4.7%), Saint Dominic (3.4%), University (3.2%), Camp Kigali (2.3%) and Remera free-car (1.4%). However, there were three areas with more concerns: St. Joseph Le Travailleur (6.6%), Glory (2.5%), Ntwali (1.9%). Finally, there were three areas with more negative experiences: Biryogo (5.9%), Kabusunzu (4.1%) and St Michel Nyarugenge (3.5%). The area FAWA did not have any observations related to street design.

Places to learn from	Biryogo car-free, KN 4 Ave, Kicukiro, Saint Dominic, University, Camp Kigali and Remera.
Places to improve	St. Joseph Le Travailleur, Glory, Ntwali, Biryogo, Kabusunzu and St Michel Nyarugenge.

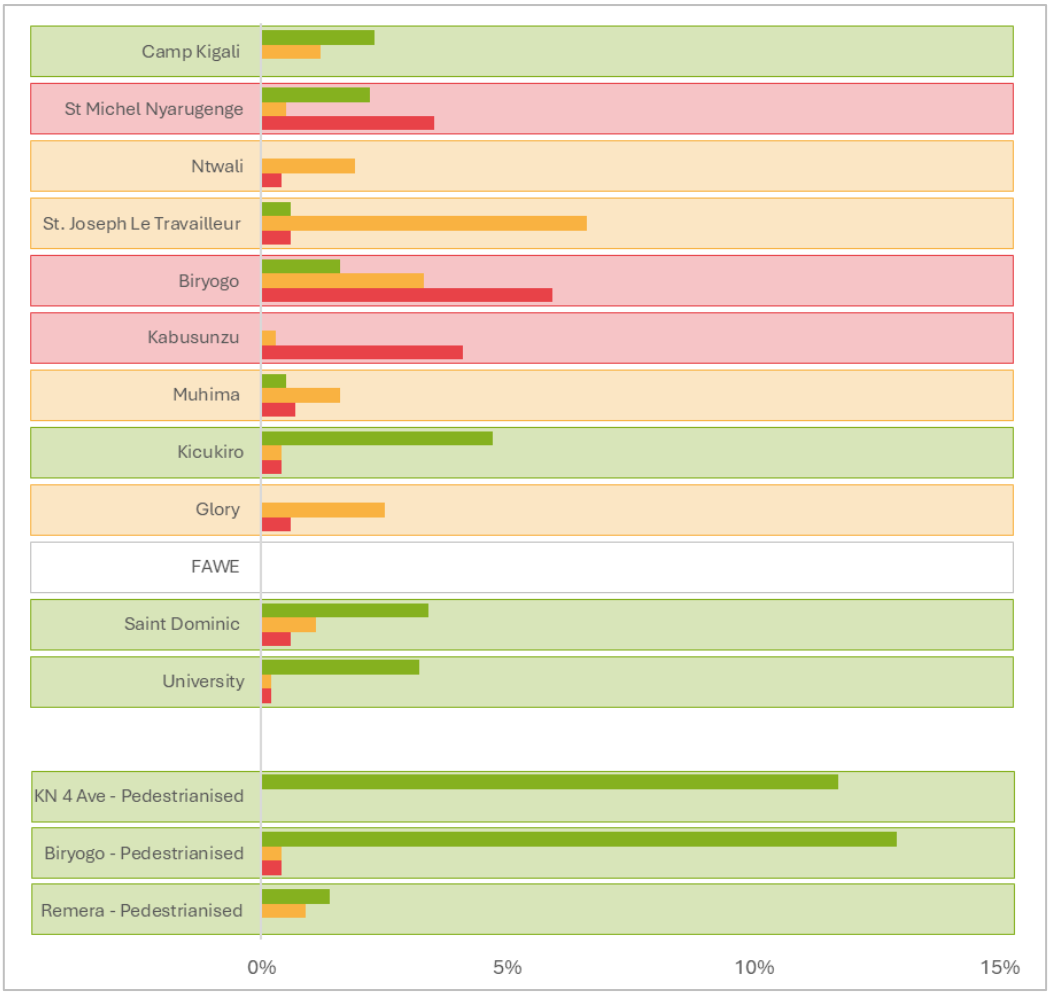


Figure 63. Experiences related to Car or pedestrian oriented street design, by study area.

Driver behaviour

Driver behaviour was the eleventh most frequent determinant (3.5%) related to walking experiences in Kigali, with 2.4% related to concerns and 1.1% related to negative experiences. There were eleven areas with more concerns: Camp Kigali (5.8%), Muhima (5.1%), Ntwali (5.2%), FAWE (3.8%), Saint Dominic (3.4%), Kicukiro (2.4%), University (2%), Glory (1.9%), Kabusunzu (1.6%) Remera car-free (1.2%) and Biryogo car-free (1.1%). Finally, there were two areas with more negative experiences: St Michel Nyarugenge (4.6%) and Biryogo (1.6%). The areas St. Joseph Le Travailleur and KN 4 Ave had no observations related to driver behaviour.

Places to learn from	St. Joseph Le Travailleur, KN 4 Ave.
Places to improve	St Michel Nyarugenge, Biryogo, Camp Kigali, Muhima, Ntwali, FAWE, Saint Dominic, Kicukiro, University, Glory, Kabusunzu, Remera car-free and Biryogo car-free.

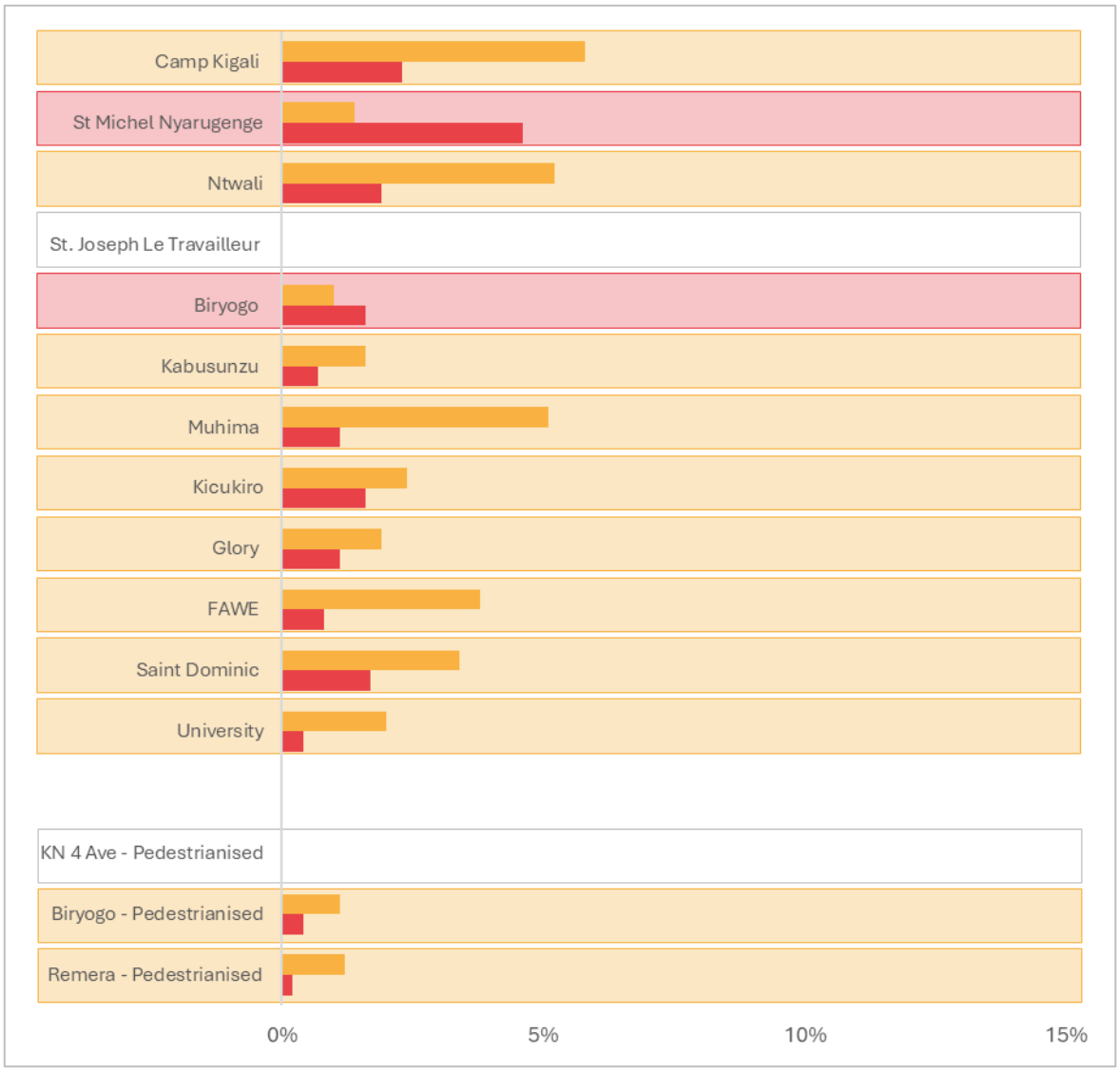


Figure 64. Experiences related to Driver behaviour, by study area.

Harassment

Harassment was the twelfth and least frequent determinant (0.4%) related to walking experiences in Kigali, with 0.3% related to negative experiences and 0.1% to concerns. By study areas, there were four areas with more negative experiences: St. Joseph Le Travailleur (2.9%), Kabusunzu (0.9%), Saint Dominic (0.6%) and Muhima (0.2%). There were two areas with more concerns: Camp Kigali (0.6%) and Ntwali (0.2%). Nevertheless, there were six areas with no observations related to harassment: St Michel Nyarugenge, Biryogo, Kicukiro, Glory, FAWE, University, KN 4 Ave, Biryogo car-free and Remera car-free.

Places to learn from	St Michel Nyarugenge, Biryogo, Kicukiro, Glory, FAWE and University, KN 4 Ave, Biryogo car-free and Remera car-free.
Places to improve	St. Joseph Le Travailleur, Kabusunzu, Saint Dominic, Muhima, Camp Kigali and Ntwali.

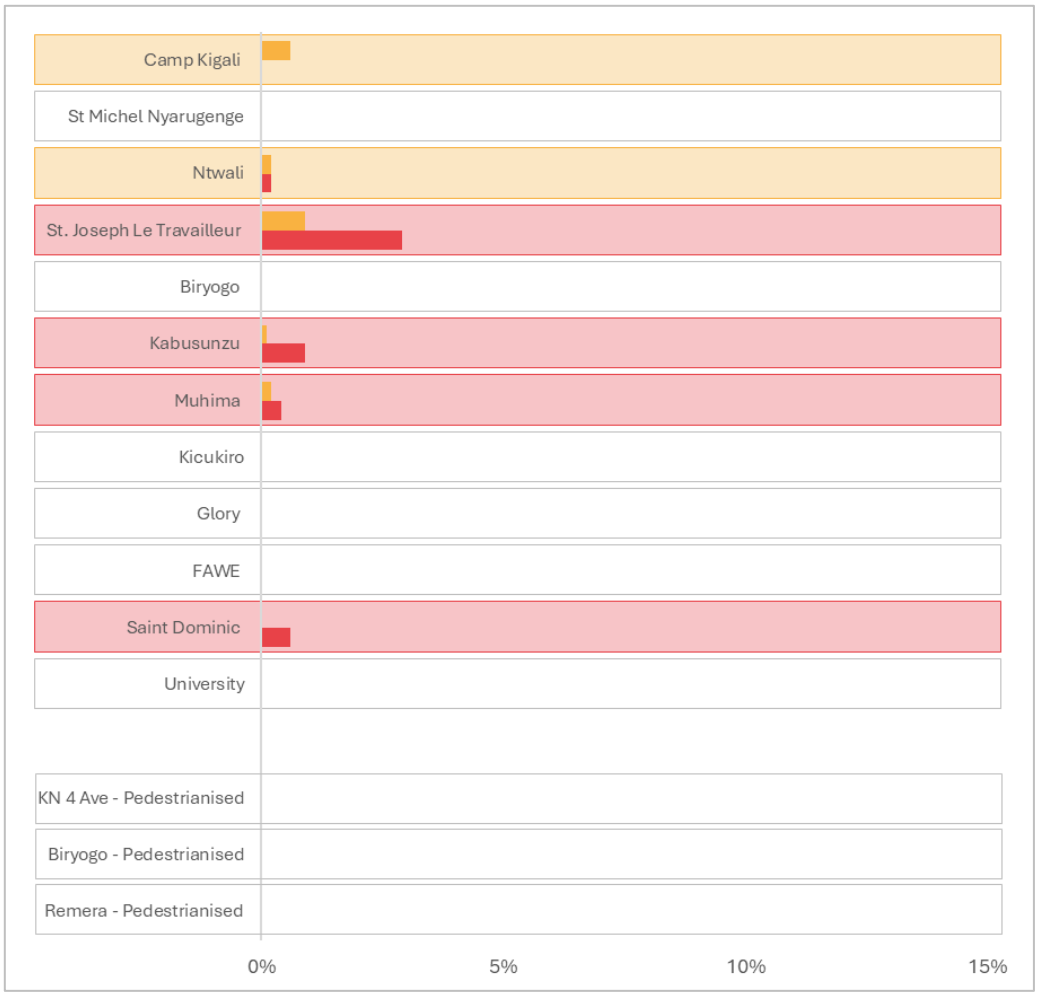


Figure 65. Experiences related to Harassment, by study area.

Summary of places with good examples and places to prioritise interventions in Kigali

Determinants	Places to learn from	Places to improve
Footpath space and quality	University, FAWE, Muhima, Kicukiro, St Michel Nyarugenge and Biryogo.	Kabusunzu, Saint Dominic, Glory, St. Joseph Le Travailleur and Ntwali.
Pedestrian crossing	Muhima	Camp Kigali, St Michel Nyarugenge, Ntwali, Le Travailleur, Biryogo, Kabusunzu, Kicukiro, Glory, FAWE, Saint Dominic, University
Protection from weather	University	Biryogo, Kabusunzu, Kicukiro, St Michel Nyarugenge, St. Joseph Le Travailleur, Saint Dominic, Camp Kigali, Glory, Ntwali, Muhima and FAWE
Trees and visual interest	Saint Dominic, FAWE, University, Camp Kigali and St Michel Nyarugenge.	Kabusunzu, Biryogo, St. Joseph Le Travailleur, Glory, Muhima, Ntwali and Kicukiro.
Lighting, seating or ramps	FAWE, Kicukiro, Saint Dominic, Muhima, Glory and St Michel Nyarugenge.	Kabusunzu, St. Joseph Le Travailleur, Ntwali and Camp Kigali.
Presence or absence of footpath	FAWE, Muhima, Kicukiro, University and Saint Dominic.	St Michel Nyarugenge, Kabusunzu, Ntwali, Biryogo, Camp Kigali, St. Joseph Le Travailleur and Glory.
Environmental quality	University, St Michel Nyarugenge, FAWE, Kicukiro, Biryogo, Saint Dominic, Camp Kigali, Glory and St. Joseph Le Travailleur.	Muhima, Ntwali and Kabusunzu.
Traffic speed	University, St Michel Nyarugenge and Kicukiro.	Kabusunzu, Biryogo, Glory, FAWE, Camp Kigali, Ntwali, Saint Dominic, Muhima and St. Joseph Le Travailleur.
Personal security	University, St Michel Nyarugenge, Kicukiro, Camp Kigali, Glory, Muhima, FAWE, Saint Dominic and Biryogo.	St. Joseph Le Travailleur, Ntwali and Kabusunzu.
Street design	Kicukiro, Saint Dominic, University and Camp Kigali.	St. Joseph Le Travailleur, Glory, Ntwali, Biryogo, Kabusunzu and St Michel Nyarugenge.
Driver behaviour	St. Joseph Le Travailleur	St Michel Nyarugenge, Biryogo, Camp Kigali, Muhima, Ntwali, FAWE, Saint Dominic, Kicukiro, University, Glory and Kabusunzu.
Harassment	St Michel Nyarugenge, Biryogo, Kicukiro, Glory, FAWE and University.	St. Joseph Le Travailleur, Kabusunzu, Saint Dominic, Muhima, Camp Kigali and Ntwali.

Table 21. Summary of places with good examples and places to prioritise interventions in Kigali.

3.8. Walking environmental determinants in Kigali, by type of pedestrian

Different types of pedestrians shared different percentages of positive experiences, concerns and negative experiences of the same places. In the case of gender, the study did not show any relevant differences on walking experiences between men and women related to all the determinants considered. In the case of pedestrian age, teenagers and adults shared more positive experiences than the rest, while older people tended to share more negative experiences, specially related to pedestrian crossings, protection from weather and absence of footpath. Finally, in the case of pedestrian ability, able pedestrians considerably shared more positive and fewer negative experiences than the rest, while impaired pedestrians shared many more negative experiences, up to 50% of all their experiences, specially related to footpath quality, pedestrian crossings, protection from weather, absence of footpath, traffic speed and driver behaviour. The following graphs in this section show how different types of pedestrians experience and perceived the walkability of Kigali in a different way depending on their needs and concerns.

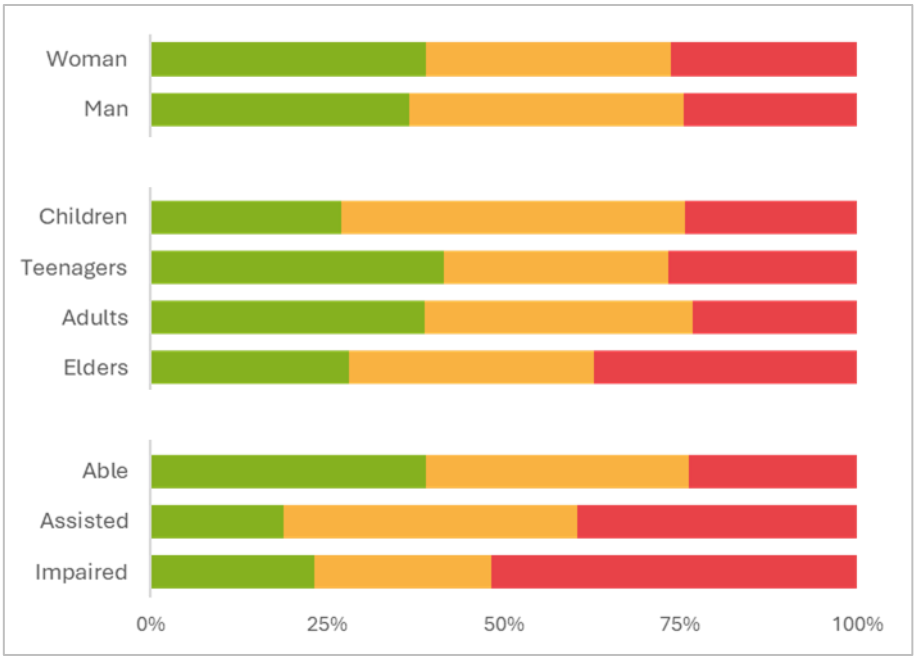


Figure 66. Experiences by pedestrian profile.

Most frequent type of walking experience (positive: green, concern: amber, negative: red) related to each environmental determinant by pedestrian gender, age and ability.

Pedestrians / Determinants	Gender		Age				Ability		
	Men	Women	Children	Teenager	Adult	Elder	Able	Assisted	Impaired
Footpath space and quality									
Pedestrian crossing									
Protection from weather									
Trees and visual interest									
Lighting, seating or ramps									
Presence or absence of footpath									
Environmental quality									
Traffic speed									
Personal security									
Street design									
Driver behaviour									
Harassment									

Table 22. Experiences related to determinants, by pedestrian profile.

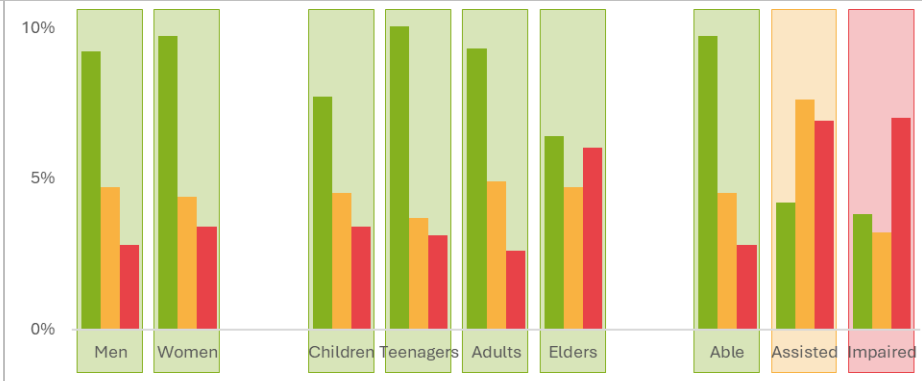
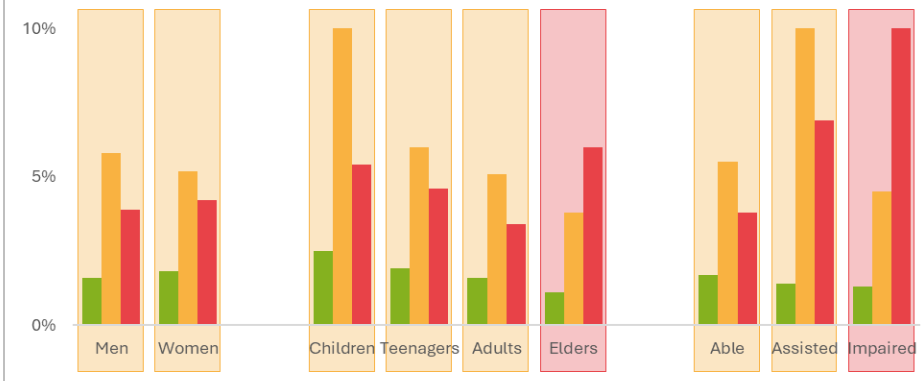
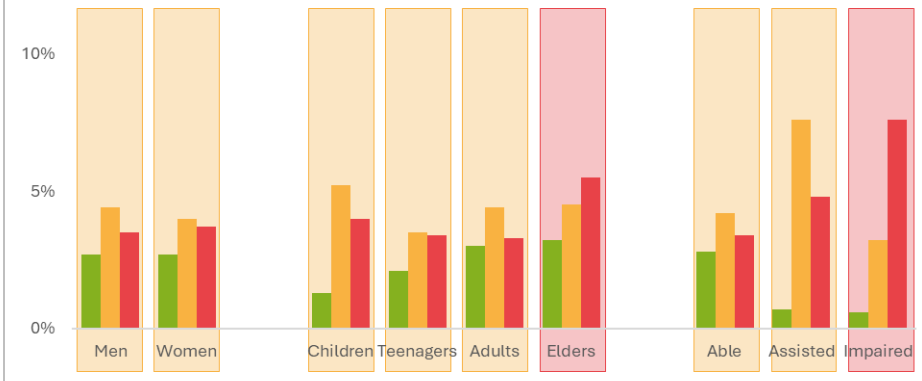
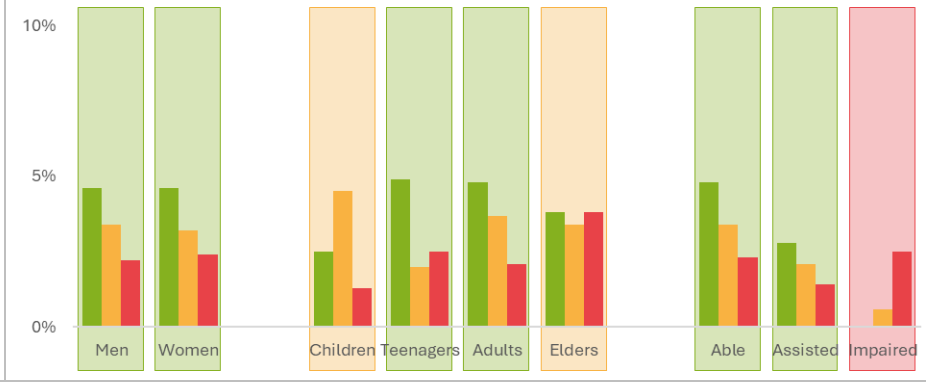
Determinant	Gender	Age	Ability
Path space and quality			
Pedestrian crossing			
Protection from weather			
Trees and visual interest			

Table 23. Experiences related to determinants, by pedestrian profile (1/3).

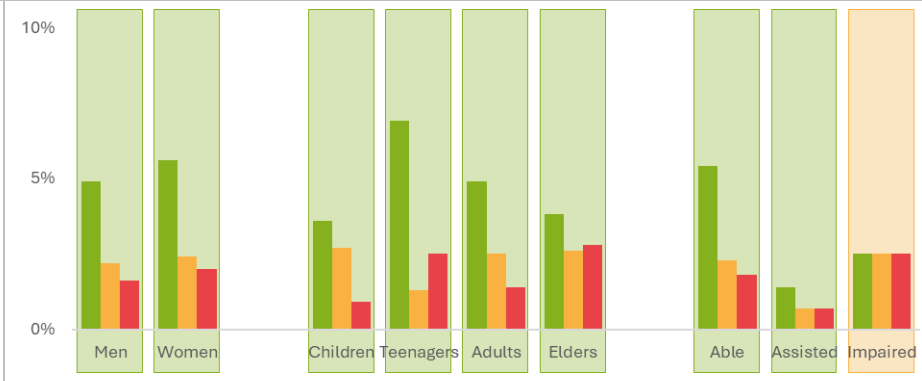
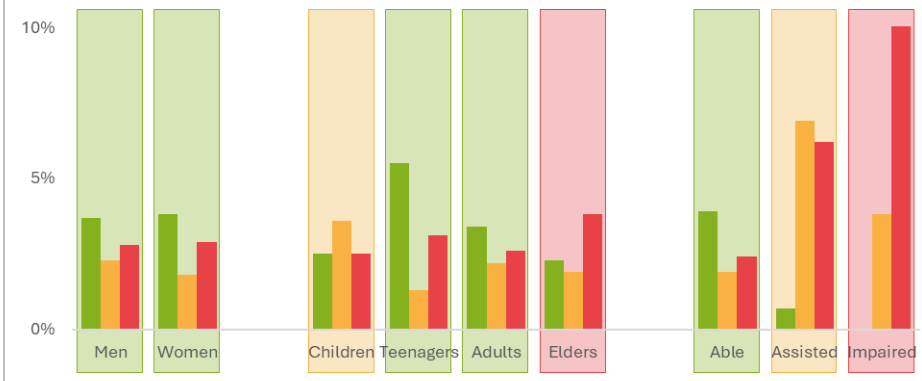
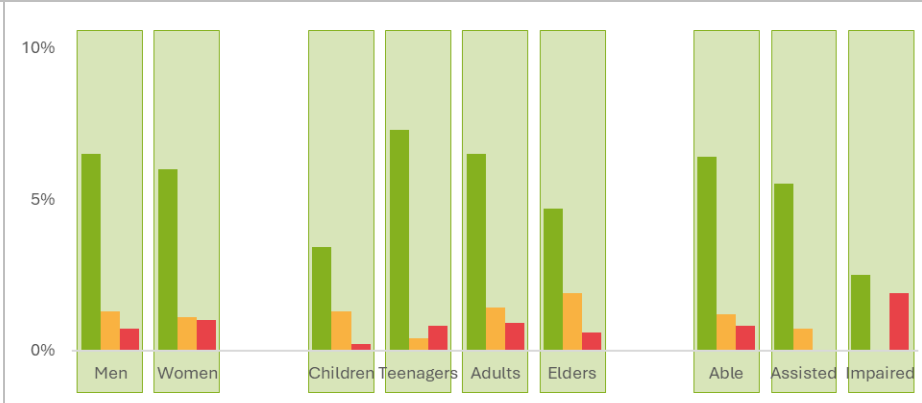
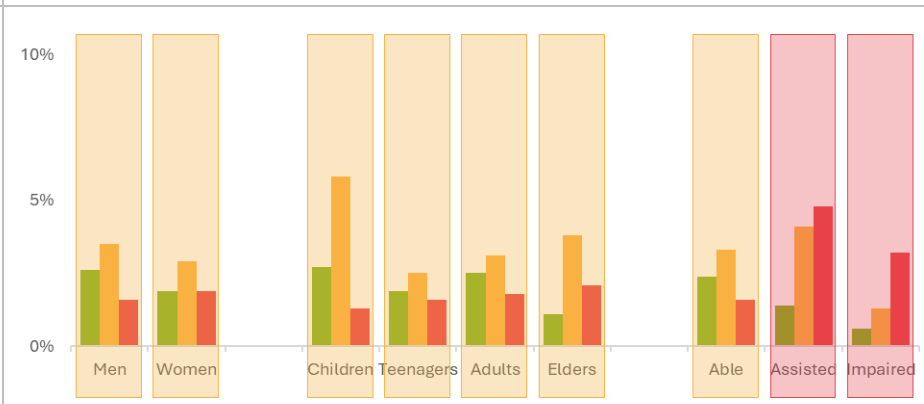
Determinant	Gender	Age	Ability
Lighting, seating or ramps			
Presence or absence of footpath			
Environmental quality			
Traffic speed			

Table 24. Experiences related to determinants, by pedestrian profile (2/3).

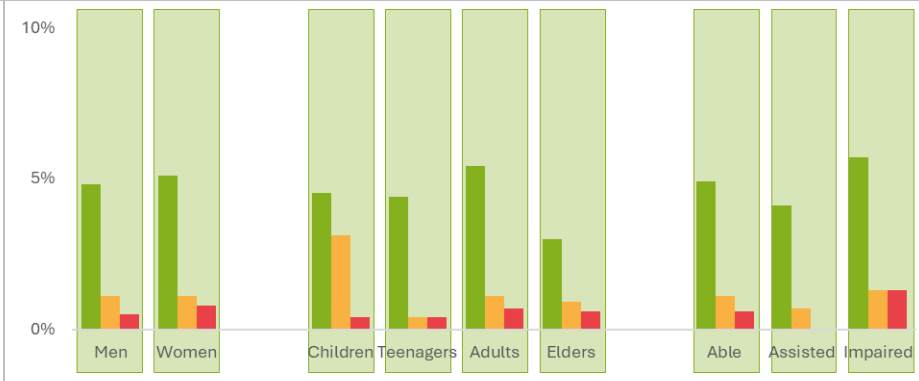
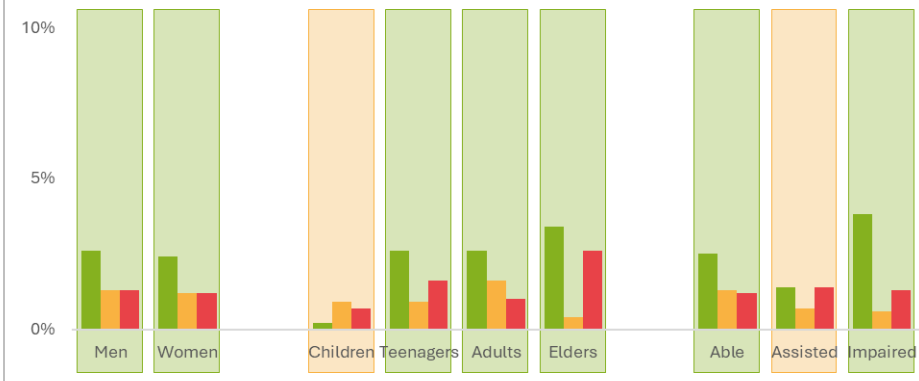
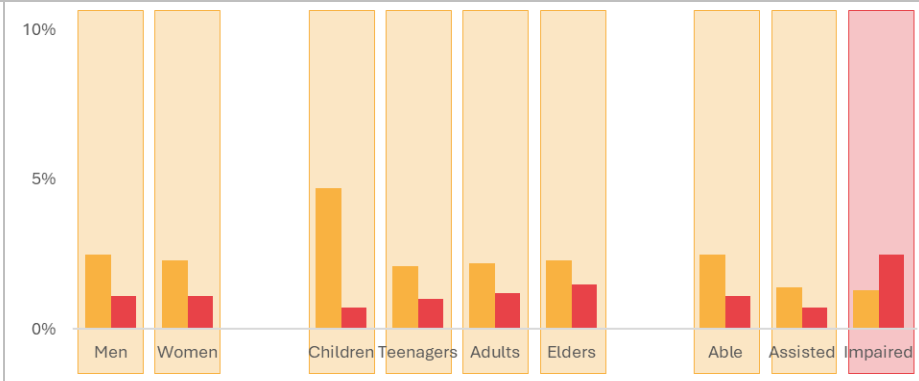
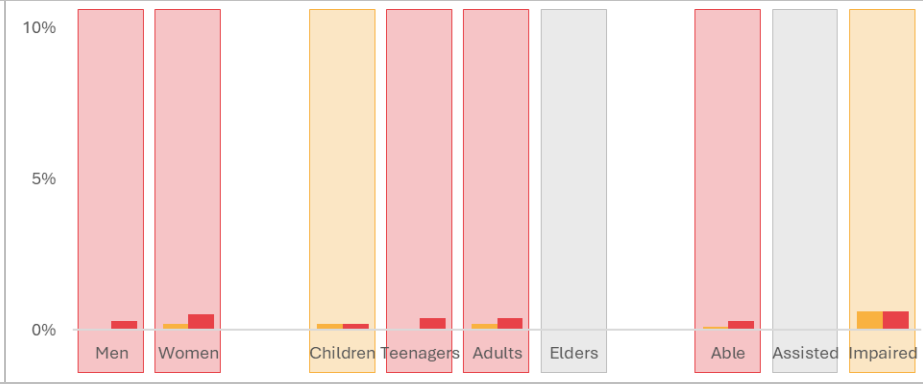
Determinant	Gender	Age	Ability
Personal security			
Street design			
Driver behaviour			
Harassment			

Table 25. Experiences related to determinants, by pedestrian profile (3/3).

3. Appendix

Appendix 1. Glossary of terms in the Walkability App

1.1 Pedestrian profile

1.1.1 **Gender:** Indicates the participant's gender

Man: The participant is a man.
Woman: The participant is a woman.
Other: The participant does not self-identify within the binary categories.

1.1.2 **Ability:** Indicates the degree of self-defined ability by the participant to walk and interact with the environment. Note that when we say ´walk' or 'walking' throughout the document we are including people who need additional support to 'walk' such as a frame or wheelchair.

Able: The participant can walk and fully interact with the environment.
Assisted: The participant needs assistance to walk and interact with the environment. Example: The participant walks with an assistive device, such as a wheelchair, crutches, a stick, cane or guide dog, or with the assistance of another person (carer).
Impaired: The participant cannot fully walk and interact with the environment. Example: The participant faces challenges or total inability to move, see, hear or interact with the environment for different reasons (mobility, visual, hearing or cognitive impairment).

1.1.3 **Age:** Indicates the participant´s age.

Child: Less than 12 years old.
Teenager: between 12 and 18 years old.
Adult: between 18 and 65 years old.
Elderly: More than 65 years old.

1.2 Walk context

1.2.1 **Decision:** Indicates whether the participant walks out of necessity or by choice.

Necessity: The participant walks because they do not have access to an effective viable alternative to reach their destination. Also known as "captive pedestrians", due to personal or service constraints (personal: economic status, ability, ownership etc.; service constraints: no public service, low frequency, low reliability etc.). Example: The participant walks because they do not own/cannot afford to buy a car or there is no accessible public transport that is affordable/reliable.

Choice: The participant walks out of choice. They could use private or public transport, but they choose to walk. Example: The participant chooses to walk as they consider it a better option

compared to other means of transport (cheaper, more convenient, healthier, faster, more pleasant, more sustainable).

1.2.2 **Purpose:** Indicates whether the participant walks for transport or leisure.

Transport: The participant walks from one place to another (from A to B) to access a specific destination (within a specific time) Example: The participant walks to work or school, walks to a public transport stop or a shop.

Leisure: The main purpose of walking is not to access a specific destination but to walk as the main activity or together with other purposes, such as moderate physical activity or sociocultural activity. Example: The participant walks to do exercise, talk or interact with others, do some sightseeing walking or window shopping.

1.2.3 **Group size:** Indicates the number of other pedestrians walking with the participant.

Alone: The participant walks on their own.
With a dependent: The participant walks with someone who needs their assistance to walk and interact with the environment. Example: Participants carrying babies in a stroller or elders on a wheelchair.
In a group: The participant walks with one or more companions.

1.2.4 **Familiarity:** Indicates the familiarity of the participant with the place.

Local: The participant is familiar with the place. They know the area where they are interviewed because they have been in the same place or area before. Example: They live, work or have walked and spent time in the area before.
Visitor: The participant is not familiar with the place. They have never been in the place or area before. Example: The participant has never walked in the area before or they do not live, work or have spent time in the area before.

1.2 Pedestrian experiences

1.2.1. **Positive experiences** (green icon)

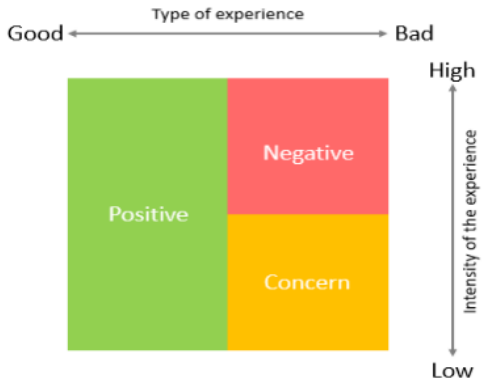
Positive pedestrian experiences while walking and interacting with the environment. The positive experiences may be related to the ease of walking in the area, as well as a positive personal sense of safety, comfort, pleasantness and vibrancy of the environment.

1.2.2. **Concerns** (amber icon)

Pedestrian concerns (mild negative experience) while walking and interacting with the environment. The concerns may be related to lack of ease of walking in the area, as well as a slightly negative personal sense of safety, comfort, pleasantness (and vibrancy) of the environment.

1.2.3. **Negative experiences** (red icon)

Negative pedestrian experiences while walking and interacting with the environment. The negative experiences may be related to high unease of walking in the area, as well as the negative personal sense of safety, comfort, pleasantness and vibrancy of the environment.



* Consideration between concerns and negative experiences: A concern does not warrant a change in behaviour but is noticeable as undesirable/annoying. However, a negative experience (i.e. problem) does warrant a change in behaviour due to the severity of the impact.

1.3 Environmental determinants

1.3.1. Linked to positive experiences

Appropriated (traffic) speed The traffic speed in the area is appropriate and not considered a threat or danger by pedestrians. Example: a street in which traffic moves slow enough so that pedestrians can make eye contact with the drivers.	
Clean and peaceful The area is not polluted with litter, odour, air or noise pollution. Example: a street with no litter, noise or air pollution.	
Designed for people The area is specially designed and managed to cater for pedestrian needs over any other means of transport or activity. Example: a pedestrianised area (street with no traffic).	
Lighting, seating or ramps The area is equipped with street furniture and infrastructure to cater for pedestrian accessibility, safety and comfort. Apart from lighting, seating and ramps, this category may include bins, public fountains and toilets, etc. (But participants/surveyors need to use the comments to add them or specify if the observation is only referring to lighting, seating or ramps in particular. Example: a street with streetlights and benches.	

Path quality The area has good quality pavements in terms of surface, width, design and maintenance. Example: a street with wide and flat pavements.	
Protection from weather The area is equipped with street furniture and infrastructure to protect pedestrians from harsh weather conditions, such as extreme heat and cold, rain, wind, humidity etc. Example: a street with shade and shelter (e.g. trees, buildings with arcades) and with storm drainage (e.g. rain sewers).	
Safe crossing The area has a designated pedestrian crossing that provides an enhanced sense of safety to pedestrians from the risk of traffic. Example: a street with signal crossing (zebra crossing) or light controlled junctions (traffic lights).	
Secure The area feels secure for personal security. This could be due to the presence of active surveillance (police, CCTV) or passive surveillance (other people in the street or buildings with open entrances), and the lack of threats to personal security, such as social misconduct, stray animals, etc. Example: a street with other people showing friendly social interactions or non-dangerous/threatening behaviour.	
Sufficient space The area provides sufficient space for pedestrians, both with the presence of wide pavements and large pedestrianised areas, and with the absence of obstacles and barriers. Example: a street with width and unobstructed pavements.	
Supported and directed The area provides infrastructure, urban and street design, and information to support pedestrian mobility. Example: a street or area that supports walking directness (no need to take detours to reach a destination (e.g. bus stop) and it is easy to navigate on foot (e.g. there is wayfinding).	
The path. The area has dedicated space (a pavement/footpath/footway) for pedestrians. Example: a street or areas with designated pavements for pedestrians.	

Trees and visual interest The area has trees or other types of greenery, as well as other elements that are considered of visual interest, such as buildings, landmarks and aesthetic scenery. Example: a street with trees, a square with traditional architecture.	

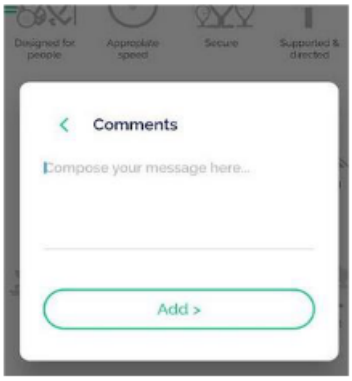
1.3.1. Linked to concerns and negative experiences.

Designed for traffic, not people The area is specially designed and managed to cater for the needs of motorised traffic at the expense of pedestrian accessibility, safety, and comfort. Example: a highway or street junction with no pavements or crossings. A large parking area with no pavements.	
Dirty, noisy or poor air quality The area is polluted with litter, odour, air or noise pollution. Example: a street with litter. A street with air and noise pollution from traffic.	
Driver (bad) behaviour The drivers of the area present bad driving behaviour that threatens or disrupts pedestrians, such as speeding, aggressive driving, disregard of traffic signs, invading the pavement (using the horn and shouting at pedestrians), etc. Example: a street where cars do not stop at pedestrian crossings or drive/park on the pavement.	
Fear of crime The area feels unsafe for personal security. This could be due to the absence of active surveillance (police, CCTV) or passive surveillance (other people in the street or buildings with open entrances), and the presence of threats to personal security, such as social misconduct, stray animals, etc. Example: A street with people presenting bad social behaviour (e.g. drinking alcohol or taking drugs, shouting or fighting). An empty street at night.	
Harassment Some people in the area present aggressive pressure or intimidation to pedestrians. This could also be unwanted Example: A street with people presenting bad social behaviour in which the participant feels they can be assaulted at any moment.	
Insufficient space or poor path quality The area has streets with insufficient space for pedestrian (safe and comfortable) mobility and their use of public space. This could be due to narrow pavements or due to the presence or obstacles and barriers, such as vehicles parked on the	

pavement, misplaced infrastructure and street furniture, vendors and other activities taking place on the pavement, crowded pavements (too many pedestrians). Path quality also refers to the quality of the pavement in terms of width, surface, design and maintenance. Example (insufficient space): An area with cars on the pavement, street vendors occupying all the pavement, crowded streets where all the pedestrians do not fit on the pavement. Example (Poor path quality): A street with narrow and broken pavements.	
Insufficient trees or visual interest The area does not have trees or any urban greenery. The area does not have any relevant urban scenery (lack of relevant architecture, buildings, landmarks, etc.) Example: a street without trees and buildings with poor architectural design.	
No lighting, seating or ramps The area is not equipped with street furniture and infrastructure to cater for pedestrian accessibility, safety and comfort. Apart from the lack of lighting, seating or ramps, this category may refer to bins, public fountains and toilets, etc (But participants/surveyors need to use the comments to add them or specify if the observation is only referring to lighting, seating or ramps in particular. Example: a street with no streetlights (or proper public lighting), and no benches.	
No path The area does not have designated pavements for pedestrians. Example: a street or segment of the street with no pavement.	
Poor drainage or protection from weather The area is not equipped with street furniture and infrastructure to protect pedestrians from harsh weather conditions, such as extreme heat and cold, rain, wind, etc. Example: a street with no shade and shelter (sun and rain) and with rain drainage (floods).	
Speed of traffic The traffic speed in the area is too fast and considered dangerous or annoying by pedestrians. Example: a street with fast traffic in which pedestrians cannot cross the road or use it to talk along the traffic.	
Unsafe crossing The area does not have a designated pedestrian crossing. Traffic has always priority at junctions. Example: a street with no signal crossing (zebra crossing) or no light-controlled junctions (traffic lights)	

1.3.3. Comments

Apart from the predefined categories to add observations on elements and characteristics of the public space, participants can add comments to their observations (Purple icon with three points at the top-right corner of the report window). This allows adding specific observations related to context-specific observations that may not be fully represented by the predefined categories included in the app.



Appendix 2. Step-by-step tutorial for surveyors: Walking interviews

2.1 Introduction of the project and the surveyor

“Hello, we are conducting a study on pedestrian safety (explain the Trans-Safe project), would you like to respond a few questions during less than five minutes?” We use the Walkability.App to collect the information that you share with us.

2.2. Ask about the pedestrian profile

In the app, go to Main Menu / Pedestrian Profile

Ask the participant about their gender, age and ability. Input the information in the Pedestrian Profile form accordingly. Click on “Continue”.

2.3. Questions about the walk context

In the app, click on “Start Walk” and the Walk Context for will automatically appear on the screen.

Ask the participant about their walk decision, purpose, group size and familiarity with the place. Input the information in the Walk Context form accordingly. Click on “Continue”.

2.4. Questions about pedestrian experience

Ask the participant if the pedestrian experience in the specific place where you are is positive, negative or with some concerns. Click on the green icon (positive), amber icon (concerns) or red icon (negative) accordingly.

2.5. Questions about environmental determinants

Ask the participant the reason(s) why the experience is positive/concern/negative. Based on their response, click on the icons that represent what they say. Add a comment if necessary. Click on “Send”.

The interview is complete. Click on the ‘red and while icon with a cross’ to stop the walk and the interview.

Repeat steps 2.1 to 2.5 with the next participant.