WALKABILITY APP

Participatory Walkability Study

Cairo, Egypt

November 2023

About Transport for Cairo

Transport for Cairo (TfC) is a strategic advisory practice specialized in sustainable urban mobility, established in Egypt in 2015. To date, TfC has successfully completed more than 50 projects that span 6 countries in Africa.

Our work covers all mobility and transport modes including formal rail and bus passenger services, informal services, shared mobility, micro mobility and active travel. We actively develop new knowledge and initiatives to transform transport in African cities focusing on informal transport transformation, digital transformation and electrification.

Our purpose is to help African cities envision and build sustainable mobility systems that make a distinctive and lasting impact on economic growth and quality of life in urban areas through three workstreams:

- **TfC Data Lab**: We specialize in data collection and aggregation; modelling; simulation and visualization. Our in-house developed data collection and management platform (RouteLab) streamlines field research mobilization, identification of data gaps, production of standardized datasets and performing effective analytics.
- **TfC Urban Mobility Lab**: We partner with universities and research and policy centers to produce publications, datasets, training programs and novel research concepts that utilize data science.
- **TfC Maps**: TfC designs maps to reflect and satisfy passenger's needs, and to help planners reimagine transit networks.

Our clients include development agencies and banks (e.g., The World Bank, The French Development Agency); public transport operators (e.g., RATP Dev, Transdev); policy and research institutes (e.g., World Resources Institute, Volvo Research & Education Foundations) and tech companies such as Google.

About Walk21

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.

Our work involves three key work streams:

- 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 livable communities globally.

About NADA Foundation

The Nada Foundation is an Egyptian non-profit organization that was established in 2014. Our unwavering commitment lies in promoting safer, more inclusive, and sustainable mobility through the provision of evidence-based solutions. We empower road users, especially the underserved and vulnerable, as well as advocate for a swift, widespread transition to clean transportation methods.

Additionally, we strive to create communities that are walkable, bikeable, and transit-friendly, with the ultimate goal of preserving lives and safeguarding our planet.

Our work is guided by strategic priorities that form the core of our mission:

- **Campaigns & Empowering Road Users:** We actively engage in impactful campaigns aimed at raising awareness and empowering road users with the knowledge and tools necessary not only for safe mobility practices, but for demanding for their rights for safe sustainable mobility.
- **Capacity Development & Training:** We prioritize capacity development by offering comprehensive training programs that equip individuals and organizations with the skills needed to contribute effectively to sustainable mobility initiatives.
- **Advocacy & Accountability:** We tirelessly advocate for policies and measures that promote sustainable transportation options while holding decision-makers accountable for their commitments toward creating safer and more environmentally friendly urban environments.
- **Networking & Building Strategic Partnerships:** We recognize the power of collaboration and actively seek opportunities to build strategic partnerships with like-minded organizations, government entities, academia, and other stakeholders to amplify our impact.

Through these focal strategic priorities, the Nada Foundation remains dedicated to driving positive change in mobility practices while ensuring a safer future for all.

Acknowledgements

We extend our heartfelt appreciation to the dedicated individuals and organizations whose contributions have shaped this project. To the team at Transport for Cairo, including Mariam Nada, Ghada Abdulaziz, and Abdelrahman Melegy, your commitment has been invaluable. To the field research teams involved in the project including Mohamed Ibrahim, Heba Kasem, Fatma Mohamed, Mohamed El-Rouby, Eman Yousef and Abdelrahman Mahmoud for mobilizing the data collection.

Our gratitude also goes to the members of Walk21, particularly Carlos Canas for leading the workshops and data analysis, Bronwen Thornton and Jim Walker, for their strategic guidance of the study. We acknowledge the NADA Foundation, represented by Shehab Abu Zeid, Amr Essam, Lobna Galal, and Youstina Ebeid, for their diverse insights and leadership of the study dissemination.

Your collaborative efforts have made this project possible, fostering a future of sustainable urban living.

Table of Contents

Table of Figures

Executive Summary

In an effort to transform Cairo into a more pedestrian-friendly city, the Walk21 Foundation, in collaboration with Alstom, partnered with TfC, and the NADA Foundation to pilot the innovative Walkability App. This initiative aimed to assess and understand the perceptions of walkability within the diverse urban landscape of Cairo. Through this comprehensive study, significant insights into user experiences, safety concerns, and accessibility challenges emerged, offering valuable pathways toward creating a safer, more accessible urban environment.

User Experiences & Challenges:

The study revealed crucial aspects of user experiences in both inner and outer city contexts. Participants, in both inner areas and outer areas, predominantly walked out of necessity rather than choice, underlining the significance of active travel in these urban spaces. The study further highlights the complex interplay of various factors influencing pedestrian experiences in Cairo. While inner city areas offered more positive experiences due to factors like walkable paths and social interaction, outer city areas faced challenges related to infrastructure, traffic speeds, and accessibility. Further interpretation of subjective and objective evaluations through the Walkability App provided insights into community needs, emphasizing the importance of nuanced interpretations and localized advocacy efforts.

Key Recommendations:

The study's findings and focused group discussions led to crucial recommendations for enhancing walkability in Cairo, including localized advocacy, digital campaigns, and infrastructure improvements. This data, when further analyzed in diverse urban settings, holds potential for evaluating public transportation integrity, essential for urban planning & addressing pressing issues. The principles and data obtained also enable tailored-reactive solutions for dynamic urban settings, aligning with long-term development plans through the Walkability App. These evidence-based initiatives could also undergo ongoing evaluation through the App, ensuring their effectiveness and relevance over time.

Conclusion & Outlook:

In conclusion, the Walkability App pilot study in the Greater Cairo Region shed light on critical factors influencing pedestrian experiences, safety, comfort, and accessibility. By encouraging ongoing research, localized advocacy, and targeted infrastructure improvements, Cairo can embark on a transformative journey toward a more walkable future. This effort aligns not only with the goal of creating pedestrian-friendly environments but also with broader objectives related to climate change mitigation and low-carbon recovery measures. Ultimately, fostering walkable cities will create healthier, more sustainable urban environments, benefiting both residents and the planet.

1 Introduction

1.1 Background & Context of the Study

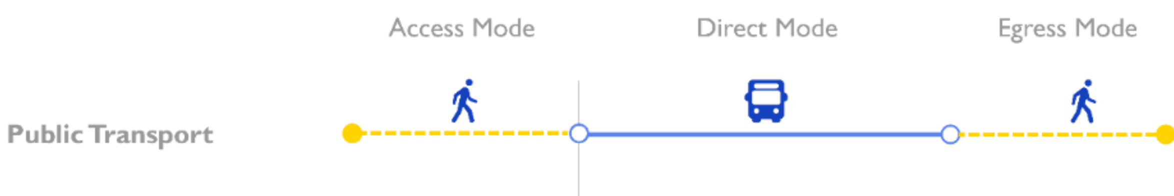
1.1.1 Importance of Walkability

Walkability is an important factor that contributes to the success of public transit systems. Research has shown that more than 90% of public transport journeys in cities include at least two walking trips; that travelers spend 45–50% of their travel time as pedestrians; and that the walking experience defines 80% of what resonates on satisfaction overall[1].

In the Greater Cairo Region (GCR) 16 million of the 26 million trips completed every day in 2014 were made using public transit (63%) which dominates motorized traffic. (These percentages are based on the CREATS Model, as reported by CEDARE in 2018).

As walking is such an integral mode to access public transit the walkability of the built environment and the accessibility of public transit stations and stops are crucial to encourage people to use public transit, and ultimately, to reduce traffic congestion, improve air quality, and promote physical activity.

Evidence suggests that good walking conditions not only facilitates a healthy urban lifestyle but also typically reduce single occupant vehicle commuting by 15 – 30%, about half of which shifts to transit[2].



1.1.2 Current state of walkability in the GCR

Pedestrian safety in Egypt is a major concern, with high rates of pedestrian deaths and 27% of all road fatalities being pedestrians. The **quality of non-motorized transport infrastructure** in the GCR presents significant challenges for walking, including insufficient sidewalks, unsafe crossings, unorganized transport interchanges, and street designs that hamper pedestrian movement.

Women's safety is also a major concern, with an estimated 1.7 million women experiencing harassment in public transport in 2015, costing 234 million LE.[3] These challenges highlight the urgent need to prioritize and improve walkability in Egypt.

1.1.3 Improving Walkability Infrastructure & Planning

The National Roads Project launched in 2014 improved many streets across different governorates, but street widening, and improved quality prioritizing private car access, have compromised pedestrian safety in some areas, especially when designs have not included sufficient safe road crossings.

Investments are being made in the GCR to improve the safety, accessibility, and comfort of pedestrians but these are often piecemeal changes to sidewalks and squares, in correlation with utility network

[1] Helge Hillnhütter, Pedestrian Access to Public Transport 2016

[2] VTPI, Evaluating Public Transit Benefits and Costs *Best Practices Guidebook 2021*.

[3] The Egypt Economic cost of gender-based violence survey, UNFPA, 2015

changes, without an understanding of where there is most need and what is required to help overcome the specific challenges that many transit users face.

By assessing the existing walkability of public transit catchments with transit users, a responsive programme of infrastructure investments can be developed to target where there is the most need and support ridership numbers and increase the efficiency of the mobility system overall.

Figure 1-1 *Mamsha Ahl Masr* Promenade upper walkway, a pedestrian-friendly corridor project along the Nile River

The challenges with pedestrian infrastructure in Egypt are particularly pronounced in New Urban Communities (NUCs). Unlike the dense, mixed-use areas of Downtown Cairo, suburban, low-rise NUCs are designed to be car-centric, with large distances between destinations and insufficient pedestrian infrastructure.

This has been reported by focus group participants who avoid using public transport when heading towards NUCs such as New Cairo, as services are not door-to-door and walking towards their destination is not feasible or desirable. In contrast, participants are much more likely to use public transport when heading towards Downtown Cairo, where parking facilities are lacking, but the area is easier to navigate as a pedestrian.

As part of the "Sustainable Development Plan for FY2021-2022," the Ministry of Planning and Economic Development (MoPED) allocated investments in transportation for National Authority for Tunnels (NAT) to finance the Light Rail Transit (LRT), Phase 1-1 of the High-Speed Rail, the two Cairo Monorails, the expansion of Cairo Metro Line 3 and Phase 1 of Cairo Metro Line 4.

These investments in transportation provide new mass transit options that will connect NUCs to the inner city. These infrastructure projects will provide faster, more reliable, and safer public transport options for residents in NUCs, reducing their reliance on private cars. *By integrating these projects with the development of pedestrian infrastructure, a more sustainable and equitable transport system that serves the needs of all residents will flourish*.

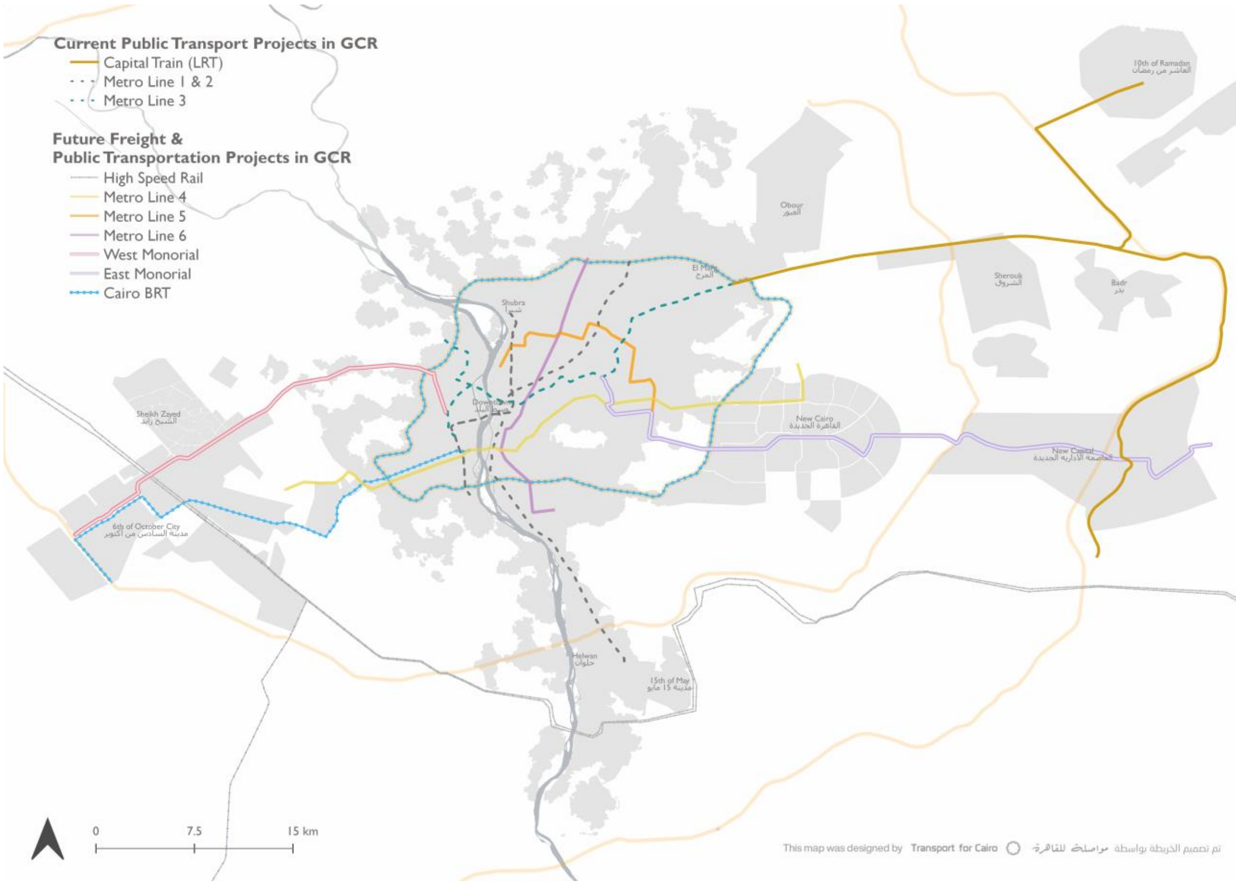


Figure 1-2 Current & Future Transportation Projects in GCR

1.1.4 Current approaches to measuring walkability.

Examining the built environment to measure walkability can be done through different approaches. A quantitative approach utilizes tools that measure elements in the built environment and compares these elements with benchmarks and design standards. But this approach has to be complemented by measuring highly subjective and arbitrary elements (e.g., aesthetic and psychological factors) in the assessment of an area's walkability.

The different on-field tools can be categorized into two types:

- **Pedestrian-based Surveys** adopt qualitative data collection methods through perception-based questionnaires that measure qualitative attributes such as the sense of security and comfort, and the impact of elements of the built environment on these attributes.
- **Corridor Access Audits** involves a thorough examination of the physical environment and layout of a corridor to ensure that it meets standards of safety and accessibility. The audit typically involves a team of FRs using quantitative observational audit tools to fulfill measurements for assessment tool.

1.2 Project Scope & Objectives

The Walk21 Foundation is in a partnership with Alstom to explore the mapping of public transit catchments for walkability around the world. They want to understand what the most effective ways are to increase ridership and user satisfaction by investing in better walkability. GCR has the potential to add to the global study by facilitating the mapping of transit catchments and demonstrating the impact of targeted responsive investment. TfC and NADA Foundation are partnering with Walk21 to use their existing "Walkability App." For the first time in the region and benefit from the insight that the data provides to help accelerate the sustainable mobility vision for the GCR.

The Walkability App presents a unique opportunity to assess user perceptions of walking experiences in conjunction with ongoing infrastructure development in the GCR. It will identify deficiencies in pedestrian infrastructure, particularly in NUCs designed to prioritize cars over pedestrians. The app will also evaluate walking experiences in inner city regions to provide a comprehensive understanding of walkability across different areas in the GCR.

Piloting the Walkability App in the GCR will build the capacity of public institutions and local NGOs to take a data-driven and evidence-based approach to pedestrian infrastructure development. The results can support planners and policymakers in making informed decisions on improving pedestrian infrastructure and creating a more walkable city.

1.2.1 Project Objectives

The main objective of the project is to develop a **proof-of-concept and pilot the use of the Walkability app in Egypt**. The project aims to assess the user-perceptions of walkability in both the inner and outer city contexts within **6 public transit catchment areas**. The project has the following objectives:

- Provide a user-based perception reporting tool (the walkability application) to assess walkability in the different areas of Inner and Outer Cairo.
- Learn from the positive and negative reported pedestrian experiences in Cairo, to influence the future design, delivery, and management of pedestrian environments – especially in public transit catchments.
- Identify the priority areas of intervention by governmental stakeholders to consider improving the pedestrian-built environment.

2 Methodology & Approach

2.1 Data Collection Tools: 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-centered 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 pre-defined categories on the Walkability App. There are 12 categories linked to positive experiences and 12 for negative experiences and concerns. Refer to Figure 3. (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 pre-defined categories).

Figure 2-1 Pre-defined environmental determinants of perceived walkability.

In addition to these four main types of data, which are self-defined and collected by participants or surveyors, the Walkability App automatically adds the location (in co-ordinates), time and date, as well as the current weather conditions of each observation.

2.2 Data Collection Strategy

2.2.1 Selection of Study Areas

Given the project's focus on improving pedestrian access to public transportation service stops and corridors, the highest onboarding and alighting stops have been chosen in both inner and outer city contexts. This selection reflects the anticipation of high usage of NMT (Non-motorized Traffic) facilities in these areas (Access & Egress from and to PT).

Furthermore, consideration has been given to the main destinations that attract transit users, such as nearby healthcare, education, sports and leisure facilities, retail areas, and employment zones. Population density alone does not adequately represent the value of human mobility and existing activity in each neighborhood or district in Cairo. Consequently, the initial approach overlooked several functional zones, like commercial areas, that should be included in the study due to their significance in daily mobility patterns and commuting within the city.

Hence, areas with the highest job densities are prioritized to encompass all functional zones and their proximity to mass transit stops. Each boarding and alighting stop is assessed based on these three main variables with equal weightings, resulting in the selection of the highest-ranking areas.

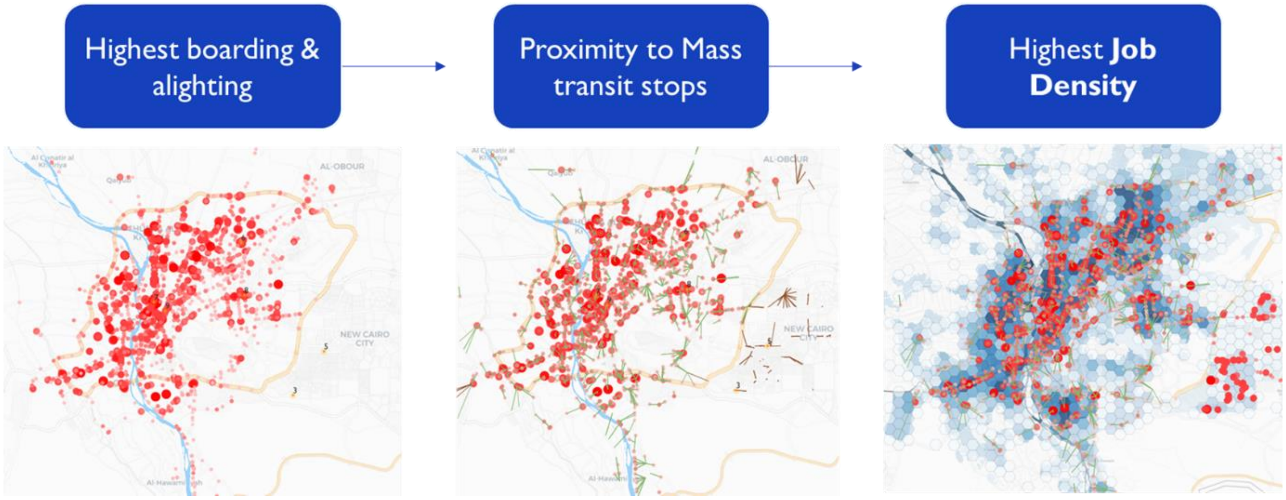


Figure 2-2 Diagram showing the 3 elements for selection of areas.

2.2.2 Prioritization of surveyed corridors

The acceptable walking distance for access/egress to public transit service nodes is typically considered to be 400 meters by most transit firms[4]. To ensure representativeness within this radius, a buffer radius of 400 meters is generally applied to the stops and selected street segments.

Within these 400-meter radii, the selection of street buffers follows three main prioritization steps. Firstly, segments that overlap with public transportation stops are chosen. Secondly, street typologies are diversified by including primary, secondary, and tertiary streets. Lastly, routes with the highest job opportunity access are selected.

Figure 2-3 illustrates the segments that have been prioritized for the study, with each segment being no longer than 200 meters in length. Field researchers (FRs) are advised to collect data specifically at these designated segments, as well as in areas where terminals or mass-infrastructure stops are located. Each area will be supported by a map to guide the FRs responsible for data collection in those areas.

[4] Ammons, D. N. (2001). Municipal Benchmarks Assessing Local Performance and Establishing Community Standards. SAGE Publications, Inc

Figure 2-3 Map showing the selection of corridors for data collection.

2.2.3 Description of the areas selected for the study

A total of 16 locations are selected as the highest-ranking areas, with 8 locations in both the outer and inner areas of Cairo. In almost all areas, the most prominent locations were those surrounding bus terminals, metro stations, and monorail stations. Conversely, the presence of LRT (Light Rail Infrastructure) was negligible or non-existent. This can be attributed to the lack of significant boarding/alighting activity and job density in these areas.

Further selection & prioritization is conducted based on the following aspects, narrowing down the selection to the final 8 study areas:

- **Urban Nature -** Selection of areas with demographic diversity are highly encouraged.
- **Intermodality -** Areas where national projects exist to support public transit systems were considered.
- **Degree of Impact -** The potential applicability of future interventions on pedestrian mobility was also considered.
- **Network Density** – Urban block sizes influence the level of pedestrian mobility within each area. Coarse grained blocks may prohibit pedestrian mobility therefore at certain areas reconsidered in selection.
- **Availability of Data** - Prioritizing areas with previous research on walkability for comparability on data analyzed.

During the selection process, some high-ranking locations were not included due to recent road infrastructure changes occurring along the street corridors. These changes had an influence on the current placement of transit catchment areas, leading to their exclusion from the final selection.

Code	Type	Area
1	Outer	**Al-Hosary**, 6th of October
3		**Ordoneya Terminal,** 10th of Ramadan
4		**Gas Terminal**, South 90th Road, Fifth settlement
5		**6th District,** 6th of October
10	Inner	**Alf Maskan Square,** Gesr Al Suez, Heliopolis
12		**Adly Street,** Azbakeya, Downtown
13		**Bab elkhalk,** Moski, Old Cairo
15		**Ramses Train Station,** El Fagala

Figure 2-5 Final 8 areas selected in the inner & outer Cairo regions.

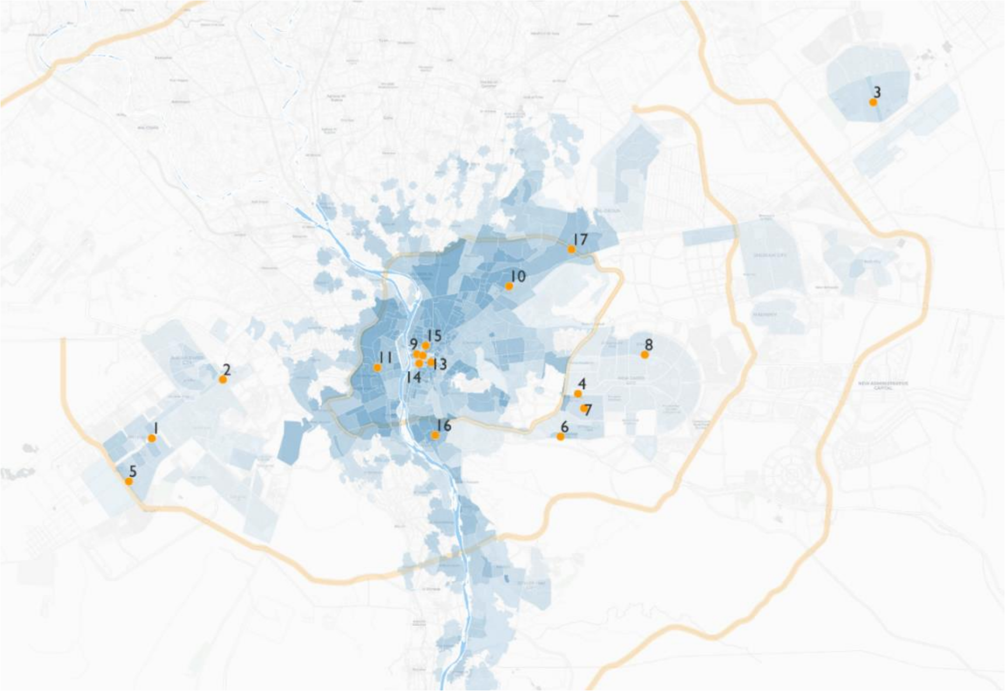


Figure 2-4 5 Map showing the 16 highest-ranking locations selected for the study.

Outer-city Locations:

1. Al-Hosary Mosque, 6th of October.

Figure 2-6 Photo taken Al-Hosary Mosque.

Figure 2-7 Satellite view of Al-Hosary Area.

Al Hosary Square is one of the most important areas in 6th of October City. It hosts a lot of activities including commercial and educational (6th of October University) services & and acts as one of the **main public transportation hubs of the city**, either formal or paratransit mobility services. It is therefore dominated by active travel and private automobile commuters alike[5]. Since the construction of the monorail in 2019, the area awaits to host a nearby station and expand to become a **wider interchange point**, facilitating transfers between the different modes of transportation within the city.

2. Ordoneya Bus Terminal, 10th of Ramadan.

Figure 2-8 Photo taken showing commercial center.

Figure 2-9 Satellite view of Ordoneya Bus Terminal.

The 10th of Ramadan is a first generation NUC, and first to be labelled in 1977.The city was designed to become economically independent, relying on the industrial factories, government

[5] Sustainable Urban Mobility Plan in 6th of October - Phase 1, 2021

built housing and subsidized land[6]. According to NUCA, 650,000 residents live here – mostly workers – who would be attracted by manufacturing jobs[7]

As part of the Integrated Multi-modal transport Strategy, the LRT (Electric train) aims to connect Metro Line 3 to both 10th of Ramadan City & the New Administrative Capital[8]. The city's industrial zone towards the south is connected by 2 operating stations, more are yet to be constructed towards the inner-city in the coming phases, close in the vicinity of the study area. Now the city is accessible only by car, private minibuses, or public buses through the Ordoneya Terminal, located in the heart of the city in the Ordoneya district, characterized by the provision of local services such as clinics, markets, education centers, vendors through mixed-used low-rise buildings.

3. Gas Terminal, South 90th Road, Fifth settlement

Figure 2-10 Photo taken showing monorail.

Figure 2-11 Satellite view of GAS Terminal.

The fifth settlement is considered a 'third generation' NUC (New Urban Community) established in 2000's by NUCA (New Urban Community Authority) to disperse urban population more evenly in satellite cities, reduce sprawl & solve housing crisis. The city is considered a typical low-rise sub-urban city, with gated communities developed through private sector companies or privately owned land plots. The study area crosses one of the most important street corridors on fifth settlement, 90th street, north & south of the street borders the city center, home to many private sector companies, banks, major hospitals, shops & restaurants. Therefore, it is widely recognized as a commercial center for the city. Across south 90th street, are residential upper-class complexes, low-rise building apartments, approx. 3-4 floors in height.

6 Egypt's New Cities: Neither Just nor Efficient, Tadamon, 2015
7 Egypt's Desert Dreams: Development or Disaster, Sims, 2014
8 10th of Ramadan – Egypt The first railway line linking Cairo to the new administrative capital, RATP Dev

4. 6th District, 6th of October, Cairo

Figure 2-12 Photo taken showing commute with Toktoks & Microbuses.

Figure 2-13 Satellite view of the 6th District.

The 6th District accommodates approximately a quarter (25%) of the total population residing on 6th October City[9]. The selected study focuses on the primary residential zone surrounding the 6th of October **bus and paratransit terminal**. The study area is also dominated by social housing complexes (affordable housing for lower-middle class income families) & the old market. The area is also directly linked to the industrial zone across the ring road with a pedestrian bridge. The area will also soon be connected to the monorail along the stretch of the Sentral Street, approximately 2 km away from the study area.

Inner city Locations:

1. Alf Maskan Square, Gesr Al Suez, Heliopolis

Figure 2-15 Photo taken at Alf Maskan Microbuses & Metro Interchange.

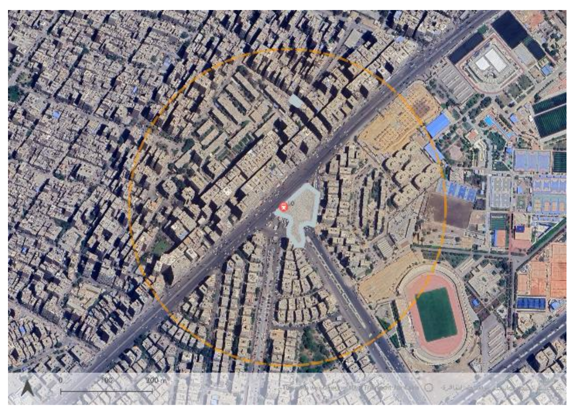


Figure 2-14 Satellite view of Alf Maskan.

---

[9] Sustainable Urban Mobility Plan in 6th of October - Phase 1, 2021

Alf Maskan is situated in the eastern area of inner-city Cairo, specifically in the Ain Shams district. It overlooks Heliopolis, Al Matareya, and Al Salam City[10]. The area presents an urban divide between the modern urban planning structure of Heliopolis to the south and the less formal areas to the north of Alf Maskan. The selected area encompasses the main interchange hub, where multiple market spaces, microbus stops, and the Alf Maskan Metro station are located. Currently, the area is undergoing the second phase of development in the Eastern Region, with plans to enhance and upgrade the surrounding neighborhoods. As part of this development, the Alf Maskan parking lot will be relocated behind Al Shams Club along Gesr Elsuez road[11]. The new parking and public transportation project in the Alf Maskan area will feature an integrated complex of services and shops, replacing the existing less formal stop. It is important to note that this project is still under construction.

2. Adly St., Azbakeya, Downtown Cairo


Figure 2-17 Photo taken at Emad Eddin St.


Figure 2-16 Satellite view of Adly St., Azbakeya, Downtown.

Downtown Cairo boasts numerous iconic landmarks, mixed-use buildings, and governmental and institutional complexes, contributing to its vibrancy and liveliness. Built by Khedive Ismail, the area adopted a layout inspired by Haussmann's Parisian design, featuring interlinked boulevards and a gridiron plan. This layout promotes easy pedestrian movement throughout the district. In terms of accessibility, downtown Cairo benefits from two Metro stations, Nasser Metro Station serves the western part of the area, while Attaba Metro Station is situated to the east. These stations provide along with other public transportation modes provide convenient transportation options for pedestrians. Downtown is primarily chosen as a positive example for the study.

[10] The prevalence of low-income markets and their negative effects on the surrounding urbanization (Case study: Alf Maskan market - Ain Shams Cairo), Rania Badawi, 2018

[11] https://gate.ahram.org.eg/News/2859597.aspx

3. sBab Elkhalk, Moski, Old Cairo


Figure 2-19 Photo showing street towards Mosque of Al-Qadi Yahya.


Figure 2-18 Satellite view of Portsaid Street, Darb El-Ahmar.

Bab elKhalk El-Mosky, one of Cairo's oldest districts, is a popular commercial hub located in the city center and downtown. Its roots date back to the Ayyub period, and it has undergone various urban transformations and extensions throughout history[12]. Notably, El-Mosky area is home to many historical and distinguished buildings, with a portion of it situated within the UNESCO World Heritage site of historical Cairo. Despite its economic, urban, and architectural significance, the area is known to face challenges such as the deterioration of its distinguished buildings and urban fabric and the proliferation of informal markets and street vendors in the area leading to issues as traffic congestions and challenging walking experiences to pedestrians.

4. Ramses Train Station, El Fagala

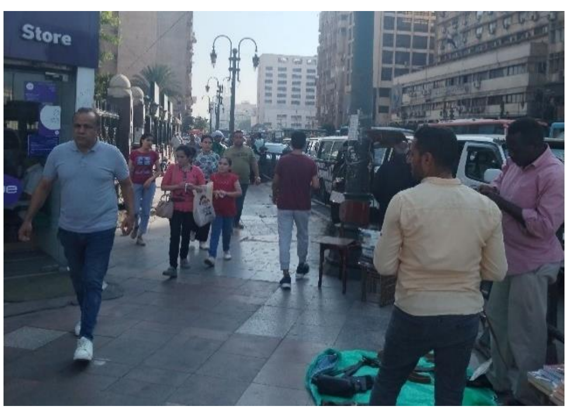


Figure 2-21 Photo taken along Ramses Street.

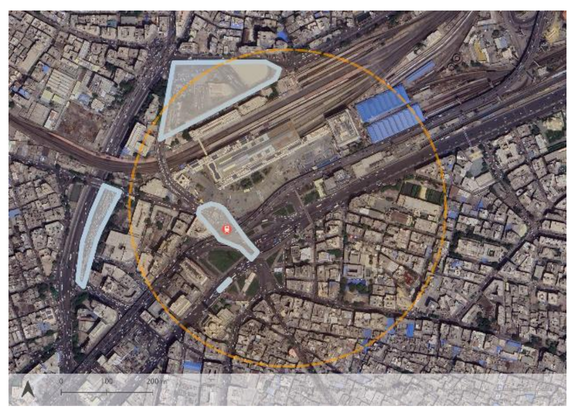


Figure 2-20 Satellite Image of Ramses Street.

Ramses Station is the main intercity transportation hub in the center of city, serving as a meeting point for different areas and sees a high volume of public transportation, including Shohada Metro Station, microbus stations, and bus stops. Approximately 28,000 pedestrians and nearly 2 million

[12] The Future Of El-Mosky District In Cairo Between Potentials And Obstacles, Doaa Abouelmagd & Eman Faiez, 2019

vehicles pass through the square every eight hours[13]. It is a linear area, bounded by the ground-level rail lines on the northwestern side and the 6th of October flyover, connected to Ramses Street, a major road linking the city center with the eastern districts of Cairo. This emphasizes the physical barriers towards walkability, creating weaker pedestrian connectivity as well as accessibility within the area.

2.2.4 Mobilization & Implementation

The Walkability application has different mobilization approaches based on the suitability of each approach in different urban and cultural contexts. The approaches can be summarized into the following:

- Surveyors complete the application with pedestrians: this approach makes it possible to complete the application with different users in the selected areas for assessment and the deployment of the number of surveyors based on the sample of pedestrians.
- Surveyors complete the application based on their perceptions and own observations: this approach might compromise the generalization of the data according to the sample of surveyors, but it can be an alternative if the local culture doesn't engage positively with the second approach.

The surveyors were guided to ask the participants two specific questions during the survey. Firstly, they were asked to reflect on their experience and categorize it as positive, negative, or concerning [1]. Secondly, the participants were encouraged to freely elaborate on the reasons behind their classification [2]. In order to ensure consistency across all surveyors, they were provided with a comprehensive glossary explaining the environmental determinants in the app. This glossary guided the surveyors in interpreting the participants' responses and making informed choices regarding the level of positive, negative, or concerning experiences as well as choice of environmental determinant. For further details, the complete guide can be found in the Appendix at the end of the report.

2.2.5 Main Considerations & aims of data collection.

2.2.5.1 Time & date frames

Conducting the survey on weekdays, particularly during morning and evening peak hours, was crucial for obtaining valuable insights. This approach ensures the inclusion of a diverse range of individuals actively commuting to work or school and utilizing public transportation. Additionally, scheduling an off-peak period was essential to identify pedestrians who walk for leisure rather than transportation purposes.

By sampling during both morning and evening periods, we can effectively pinpoint any variations in perceived walkability throughout the day. This approach enabled us to gather a more nuanced understanding of the subject. Consequently, data was collected three times at different time periods within each area:

1. **Morning Peak:** 7 am - 10 am
2. **Evening Peak:** 3:30 pm - 6:30 pm
3. **Off-Evening Peak:** 7 pm - 10 pm

2.2.5.2 Population sampling strategy

[13] Transformation Through Sustainable Qualification: A Sustainable Railway Neighbourhood in Ramses Area, Gehan Nagy & Manal Elshahat, 2012

To ensure the representativeness of our findings across different urban areas and time spans, a random sampling strategy was employed. This method aims to capture the diverse population present during various times of the day. However, several factors needed careful consideration during implementation.

Gender: To maintain a balanced representation, the Field Research team will consist of an equal 50/50 male/female composition. Each area was covered over two days, by a male researcher and a female researcher together. This approach is designed to achieve an equal split in the sampled population. It's worth noting that previous feedback from the Field Research highlighted potential challenges such as cultural inhibitions, reluctance to engage with researchers, and a lower proportion of females on the streets, which might impact the gender balance in our sample. Yet, equal balance was successfully achieved.

Age Groups: Special attention will be paid to interviewing children; their participation requires the consent of their legal guardians. To ensure ethical practices, surveyors avoided interviewing unaccompanied children. Instead, they were encouraged to approach two specific demographic groups:

- **Older Population Samples (+65):** Engaging with the elderly population provided valuable insights, considering their unique challenges in daily walking mobility.
- **Physically Impaired Individuals:** People with physical impairments represent a group facing complex challenges in walking mobility. Surveyors will actively approach this demographic to understand their experiences comprehensively.

2.2.5.3 Final Data Collection

In the study, our goal was to collect data from specific pedestrian numbers in various urban areas. We aimed for a minimum of 77 pedestrians per area, totaling 960 interviews across the study period. Each researcher conducted 40 interviews per day in areas visited three times, covering 8 locations and surveying approximately 120 participants in each.

To achieve this, a team of 6 Field Researchers worked for 4 consecutive days. Each pair of researchers audited a single location during peak hours, gathering a total of **1,335 user-percept responses** from the 8 areas.

However, challenges arose during the data collection. Some areas had high rejection rates or low pedestrian density, leading researchers to resort to self-assessment of which resulted in approximately 120 self-assessments. Additionally, reluctance from pedestrians in certain areas posed difficulties in which some faulty information might have been conveyed.

2.2.5.4 Context-specific Determinants

The app integrated custom keywords, addressing specific local issues not initially included in the comments section. These additions tailored the app to capture unique community concerns, ensuring a more accurate and relevant understanding of the local context. The following keywords entail some of the selected issues:

Keywords related to each determinant	Environmental Determinants
اختر أيًا من التعليقات: • **الإضاءة :** Lighting • **المقاعد :**Seating • **منحدرات** : Ramps	**Positive & Negative** Determinant: Lighting, seating & ramps
اختر أيًا من التعليقات: • **مساحة غير كافية :** Insufficient Space • **سوء حالة المسار :** Poor path quality	**Negative** Determinant: Insufficient Space & Poor path quality

• الباعة الجائلين	Street Vendor’ presence either positive or negative’
• الازدحام	If there is Street Vendors
• لا يوجد مشاة	If streets are empty of people that affects personal sense of safety
• سور	If there is a fence impeding access to sidewalks or along medians

2.3 Data Analysis & Reporting

The Walkability App, as described in section 2.1, facilitated comprehensive content and spatial analysis, leading to valuable insights in walkability reports. The analysis encompassed several key aspects:

1. **Share of different pedestrian experiences by study areas.**
   The project calculated and compared the percentages of different pedestrian experiences (positive, concerns, and negative) within each of the 8 public transit catchment areas.
2. **Spatial distribution and clusters of different pedestrian experiences within each study area.**

   Geo-located observations were spatially aggregated to generate heat maps, showcasing clusters of pedestrian-friendly (positive experiences) and unfriendly (concerns and negative experiences) areas.
3. **Most relevant environmental determinants of perceived walkability.**
   Participants' rated experiences allowed the identification of environmental determinants influencing them. Content analysis highlighted context-specific elements shaping pedestrian experiences positively and negatively.
4. **Filter outcomes based on pedestrian profiles and walk context.**

   Outcomes were filtered based on pedestrian profiles and walk context. The content and spatial analysis applied to specific pedestrian types and walk contexts yielded varied outputs on perceived walkability and its environmental determinants. Data disaggregation by time, date, and weather conditions explored their impact on pedestrian experiences and environmental determinants in the same location.

3 Data Analysis & Findings

3.1 Inner-Outer city Walk-scape.

3.1.1 Pedestrians profile

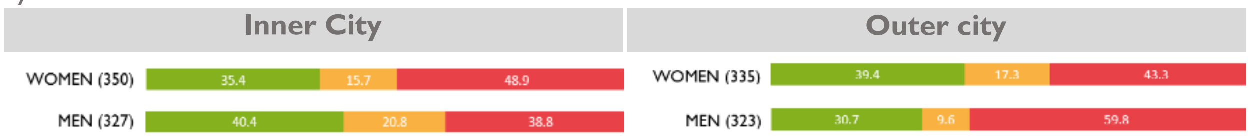
By examining the three types of experiences in Figure 3-1 based on the pedestrian's profile and the context of their walk, it is observed that women perceive walkability more positively than men. However, when aggregated by areas, women perceive walkability more negatively than men in Inner city areas, and more positively in the outer city areas.

Type of experiences: ● Positive ● Concerns ● Negative

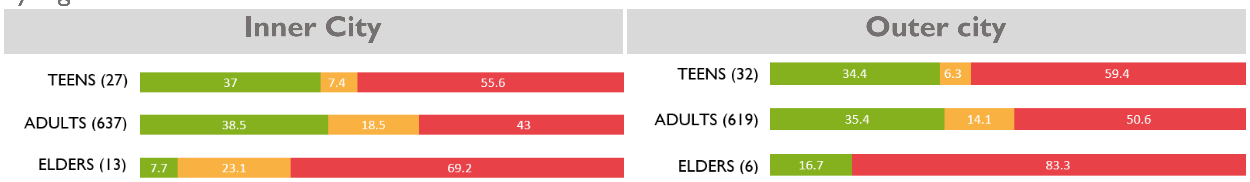
Figure 3-1 Type of Experience by colour

It is also observed that teenagers experience public spaces more negatively than adults either in the inner or outer city contexts as well as elder groups, which report the greatest number of negative experiences in both inner & outer contexts. Similarly, individuals who identify as needing assistance or impaired seem to become challenged as well, especially more in the outer-city contexts than the inner-city, which is perceived more positively by the same group in the studied areas.

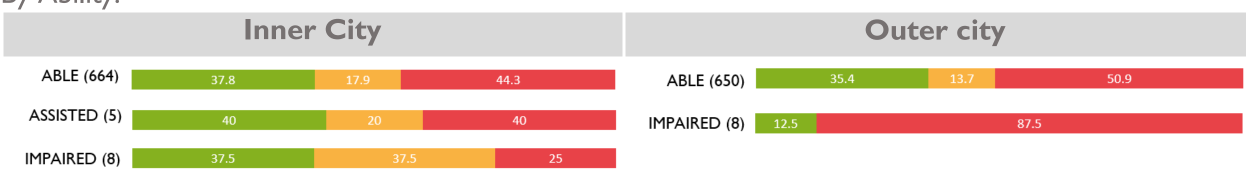
By Gender:



By Age:



By Ability:



3.1.2 Walk Context

People selected for the sample either in Inner or Outer locations show clear bias towards their 'need' to walk (954 participants) than 'choice' (381 participants) probably also indicating that most participants are not private-car users. In inner city locations, a higher percentage of people choose to walk (39.7%) compared to outer city locations (17%), suggesting that active travel is more feasible in these urban contexts. This is further supported by the purpose of walking, as individuals in inner city areas engage in leisurely walks more frequently than those in outer city areas.

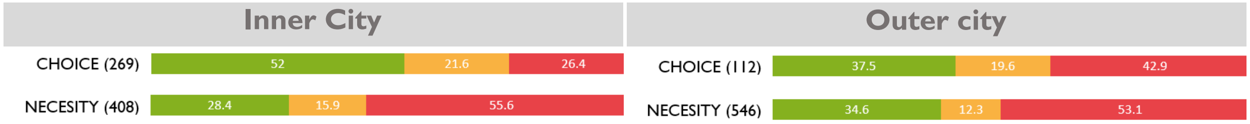
Consequently, people who voluntarily choose to walk for leisure in inner city locations tend to have more positive experiences compared to their counterparts in outer city areas. However, individuals who walk out of necessity in inner city locations report a higher number of negative and concerning experiences than those in outer city areas. On the other hand, perceptions of walkability in outer city areas remain relatively consistent regardless of the purpose of walking.

Furthermore, individuals walking with a dependent face greater challenges in inner city areas, leading to a more negative perception of public spaces. Conversely, the opposite is observed in outer city areas, where walking with a dependent has less of a negative impact.

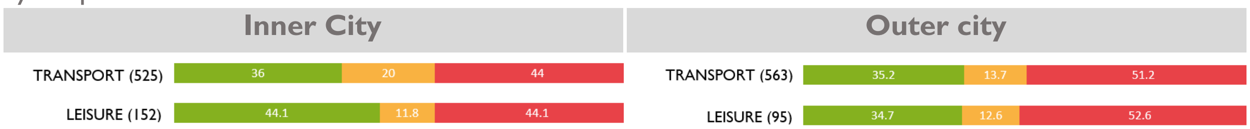
Moreover, people walking in groups generally have a more positive perception of walkability in inner city areas compared to those walking alone or with a dependent. This could be attributed to the sense of safety and security that comes with walking in a group. Finally, the presence of companions does not significantly affect perceptions of walkability in outer city areas.

Lastly, both locals and visitors tend to perceive the area more negatively in both inner and outer city locations.

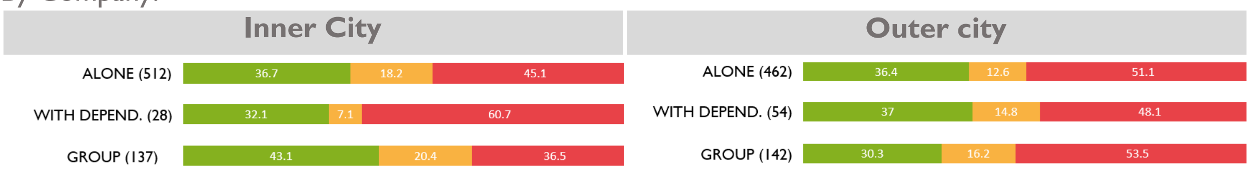
By Decision:



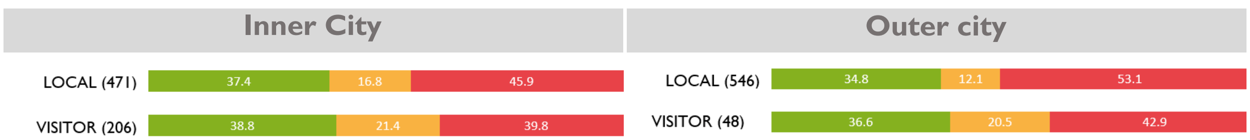
By Purpose:



By Company:



By Familiarity:



3.1.3 Pedestrian Experiences

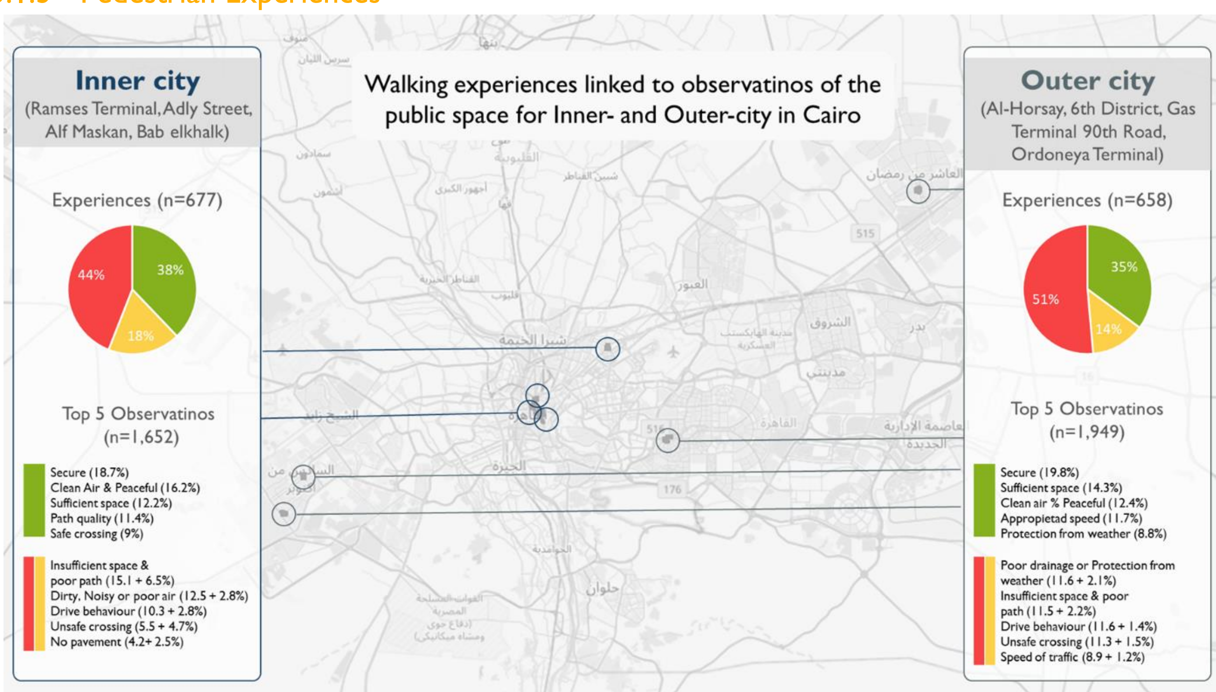


Figure 3-2 Pedestrian Experiences in Inner & Outer Cairo Contexts.

The walking experience does not exhibit significant differences between the inner and outer city areas. (Refer to Figure 3-2) Both areas display a notable inclination towards negative walking experiences. Interestingly, the most commonly and positively reported environmental factor in both inner and outer city locations is 'Security.' (Refer to Figure 3-3)

This can be attributed to the presence of high volumes of people and commercial activities within the selected vital interchange areas of the city. These areas create a sense of safety and security, as they are bustling with activity, making them feel secure and safe for pedestrians at different times of the day. Several comments repeatedly mentioned the liveliness of these areas, further reinforcing the positive perception of security.

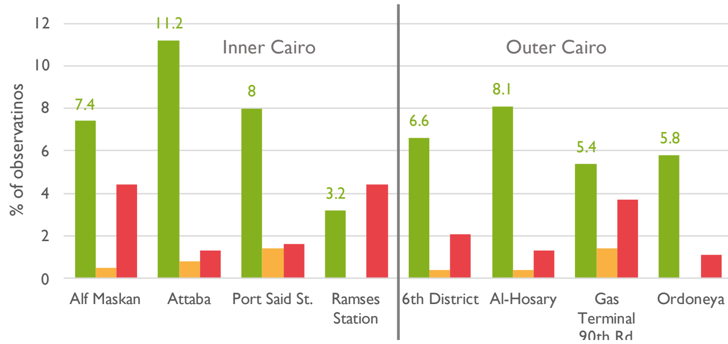


Figure 3-4 Observations related to 'Security' versus 'Fear of Crime.'

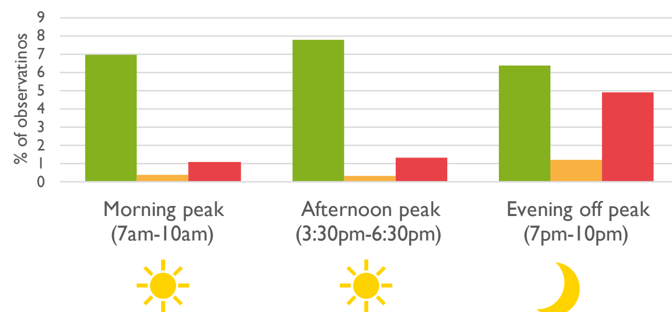


Figure 3-3 Sense of 'Security' & 'Fear of crime' in relation to time

Figure 3-5 Sense of 'Security' attributed to the level of activity.

The most commonly and negatively reported environmental factor in both inner and outer city areas is the "insufficient space and poor path quality." This indicates that pedestrians in both areas face challenges related to limited space and the overall condition of the paths they walk on are poor. In addition to this shared determinant, the most negatively reported environmental factor in outer city areas is the "poor drainage and lack of protection from weather." It is worth noting that certain determinants appear as both positive and negative influences simultaneously. To better understand this aspect, it is necessary to consider the specific contexts and determinants in each area. Factors that may have dual effects could be influenced by site-specific conditions and the interplay of various environmental elements in each respective location. However, this observation also highlights the fact that pedestrians prioritize these elements, whether positively or negatively, when it comes to their walking experience. The common emphasis on factors such as sufficient space, path quality, and protection from weather indicates that pedestrians place significant importance on these aspects of the built environment.

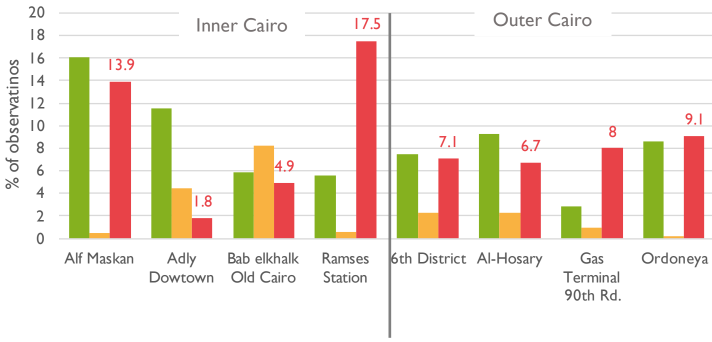


Figure 3-6 Observations related to 'Space or Path Quality.'

Figure 3-7 Alf Maskan showing both same positive & negative experiences.

3.1.4 Environmental Determinants linked to Pedestrian Experiences

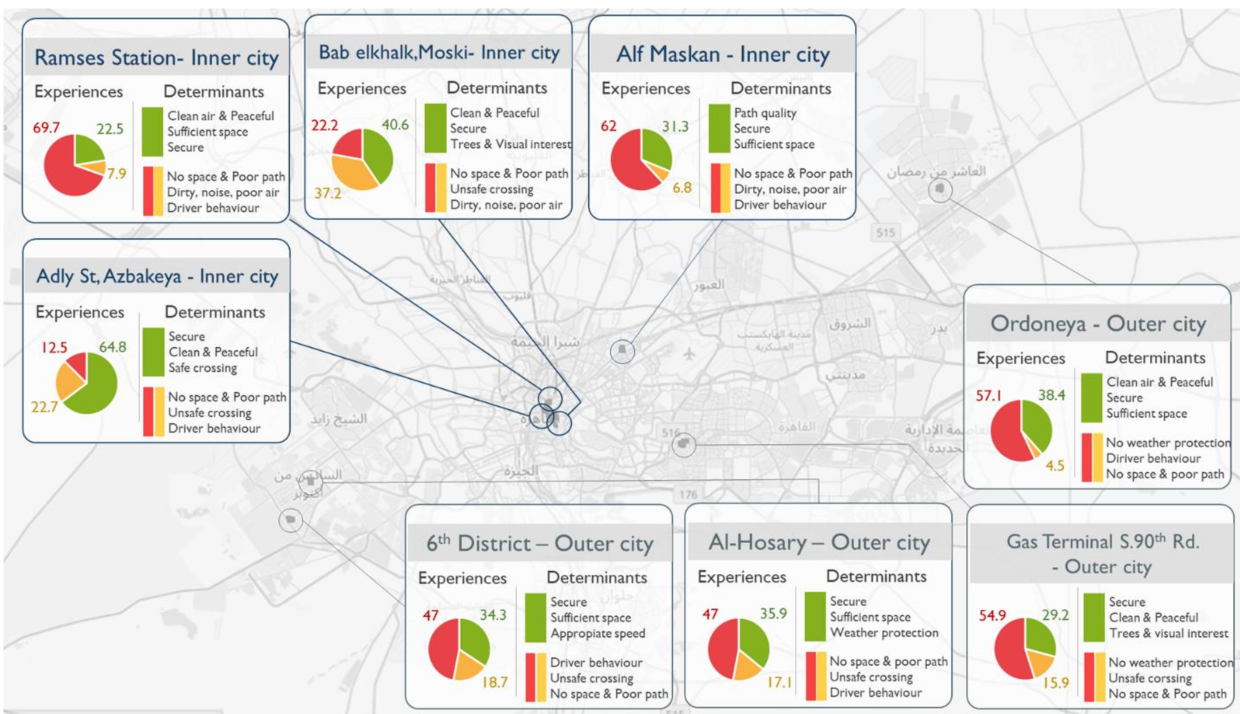
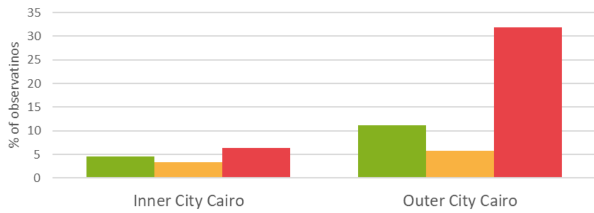


Figure 3-8 Environmental Determinants linked to inner & outer city locations.

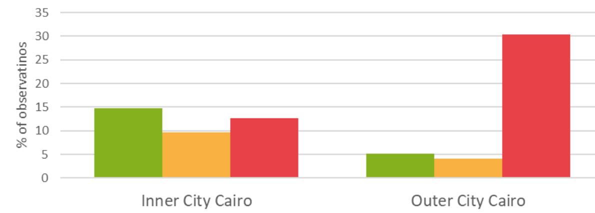
There is a strong correlation between negative experiences and the busy terminals located in the Inner city. Interestingly, only one area (Azbakeya, Downtown) within the Inner City is perceived as "Positive," while all other areas are predominantly seen as "Negative" by pedestrians. Among these areas, Ramses Station in the Inner City and Ordoneya in the Outer City are identified as particularly critical in terms of negative experiences.

When examining the specific negative environmental determinants, ‘Insufficient space and poor path quality’ emerge as the most recurrent factors in the Inner City. On the other hand, participants in the Outer City highlight concerns related to ‘Protection from weather’, ‘Drivers' behavior’, and ‘Unsafe crossings’. These factors are consistently brought up by pedestrians as significant contributors to their negative experiences in the respective areas. Overall, this analysis reveals distinct patterns in the negative experiences reported in the Inner and Outer City regions.



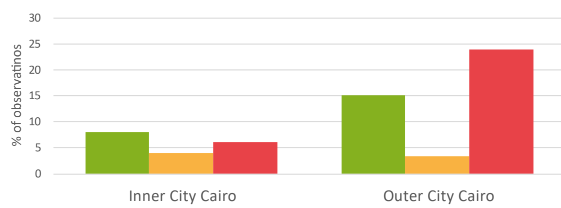
Protection from weath	Protection from weat		Poor drainage or prot		Poor drainage or prot	
	N	%	N	%	N	%
Inner City Cairo	19	4.6	15	3.4	23	6.4
Outer City Cairo	56	11.2	27	5.7	150	31.8

Figure 3-9 Observations related to 'Protection from Weather'



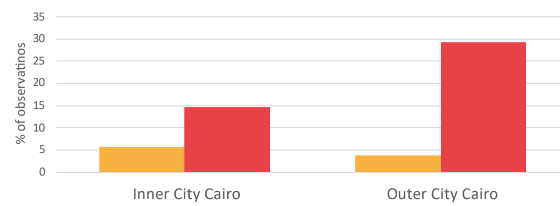
Crossing	Safe crossing		Unsafe crossing		Unsafe crossing	
	N	%	N	%	N	%
Inner City Cairo	58	14.7	44	9.6	49	12.6
Outer City Cairo	24	5.1	19	4.1	146	30.3

Figure 3-10 Observations related to 'Crossings'



Traffic speed	Appropriate traffic spe		Speed of traffic		Speed of traffic	
	N	%	N	%	N	%
Inner City Cairo	33	8.1	17	4	24	6.1
Outer City Cairo	74	15.2	16	3.4	115	23.9

Figure 3-11 Observations related to 'Traffic Speed'



Driver behaviour			Driver behaviour		Driver behaviour	
	N	%	N	%	N	%
Inner City Cairo			25	5.6	56	14.7
Outer City Cairo			18	3.8	150	29.3

Figure 3-12 Observations related to 'Drivers Behavior'

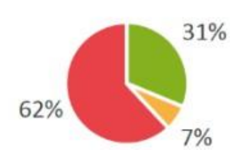
3.2 Environmental Determinants linked to the different Public Transit Catchment areas.

3.2.1 Inner City

3.2.1.1 Alf Maskan Square

Looking into the 192 shared pedestrian experiences, the majority were linked to negative experiences (n=119,62%), followed by positive experiences (n=60, 31.3%) and concerning ones (n=13, 6.8%).

	N	%
Positive	60	31.3
Concern	13	6.8
Negative	119	62
TOTAL	192	100



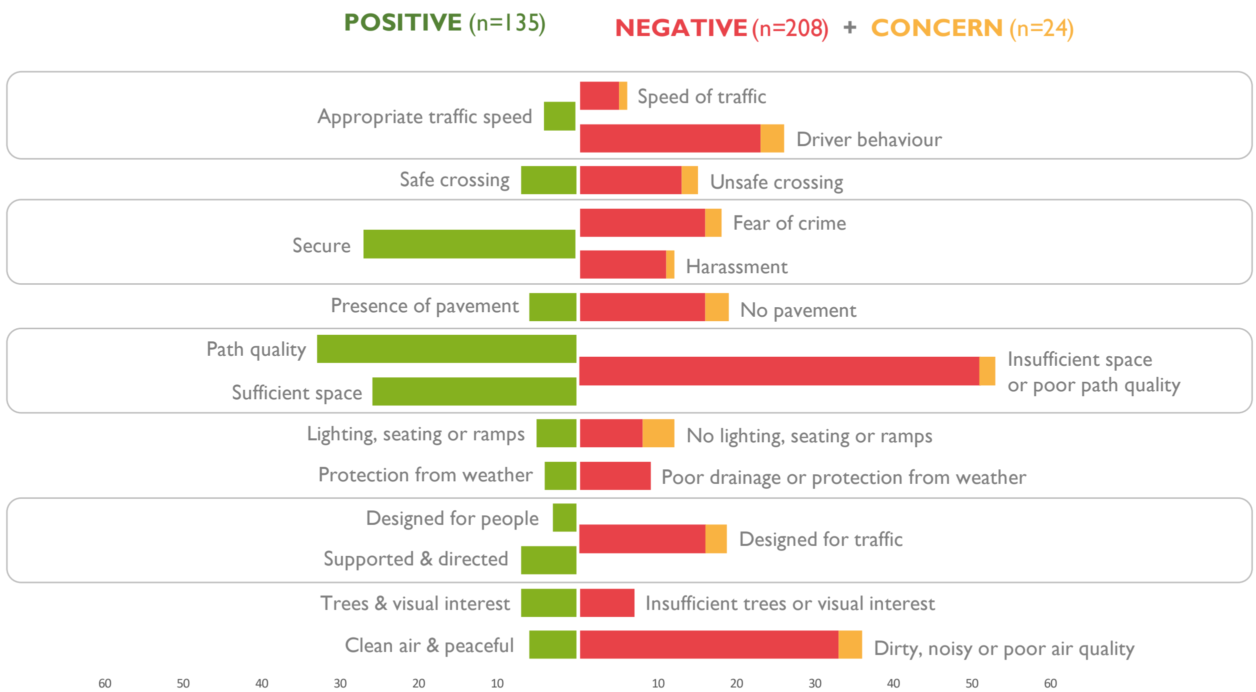


Figure 3-13 Observations linked to determinants in Alf Maskan

The most frequent and relevant determinant linked to negative or concerning experiences is "Insufficient Space or Poor Path Quality" (14.4%), followed by "Dirty, Noisy & Poor Air Quality" (9.8%) and "Driver Behavior" (7.2%).

On the other hand, the three most frequent and relevant environmental determinants linked to positive experiences, in descending order, are "Path Quality" (9%), "Sufficient Space" (7.1%), and "Security" (7.4%).

Figure 3-15 Street vendors & Alf Maskan Market

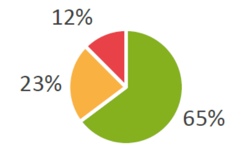
Figure 3-14 Resemblance of good path quality areas

We can observe that the highest reported determinants for the positive & negative experiences are opposing one another as a high proportion of pedestrian's report 'Insufficient Space or Poor path Quality' whereas the highest positively reported determinant is the 'Path Quality'. (Refer to Figure 3-13) This could be due to the heterogeneity of the environments along different parts of the study area. This overall shows that most participants commonly praise places with space and quality as a priority.

3.2.1.2 Adly St, Azbakeya

Looking into the 128 shared pedestrian experiences, the majority were linked to positive experiences (n=83,64.8%), followed by concerning experiences (n=29, 22.7%) and negative ones (n=16, 12.5%). It's important to note that Attaba is the most positively rated area of all the 8 study areas.

	N	%
Positive	83	64.8
Concern	29	22.7
Negative	16	12.5
TOTAL	128	100



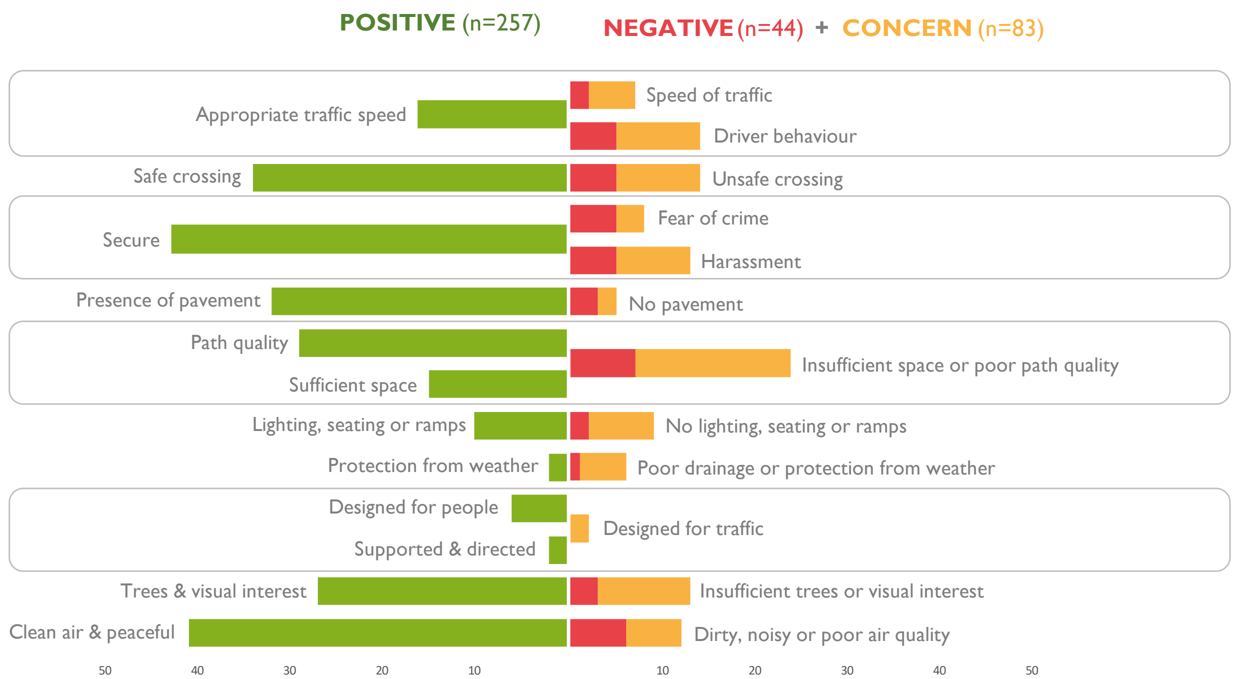


Figure 3-16 Observations linked to determinants in Adly St

The most frequent and relevant determinant linked to positive experiences is "Security" (11.2%), followed by "Clean Air & Peacefulness" (10.7%), "Safe Crossings" (8.9%), and "The Path" (8.3%).

On the other hand, the three most frequent and relevant environmental determinants linked to concerning and negative experiences, in descending order, are "Insufficient Space or Poor Path Quality" (6.2%), "Driver's Behavior" (3.6%), and "Unsafe Crossings" (3.6%).

When we analyze the data, it becomes evident that the highest reported determinants for negative or concerning experiences are associated with "Insufficient Space." This holds true despite the presence of good "Path Quality" or "Pavement" that received high votes within the same area. However, context-specific determinants such as the presence of "Street Vendors" or temporary obstructions have a significant influence on pedestrian perceptions and are considered a priority while walking in Downtown as-well.

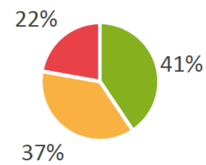
Figure 3-18 Image showing zebra crossings & Traffic lights.

Figure 3-17 Image showing wide & good quality pavements.

3.2.1.3 Bab elkhalk, Moski

Looking into the 180 shared pedestrian experiences, the majority were linked to negative experiences (n=40,62%), followed by concerning experiences (n=67, 37.2%) and positive ones (n=73, 40.6%).

	N	%
Positive	73	40.6
Concern	67	37.2
Negative	40	22.2
TOTAL	180	100



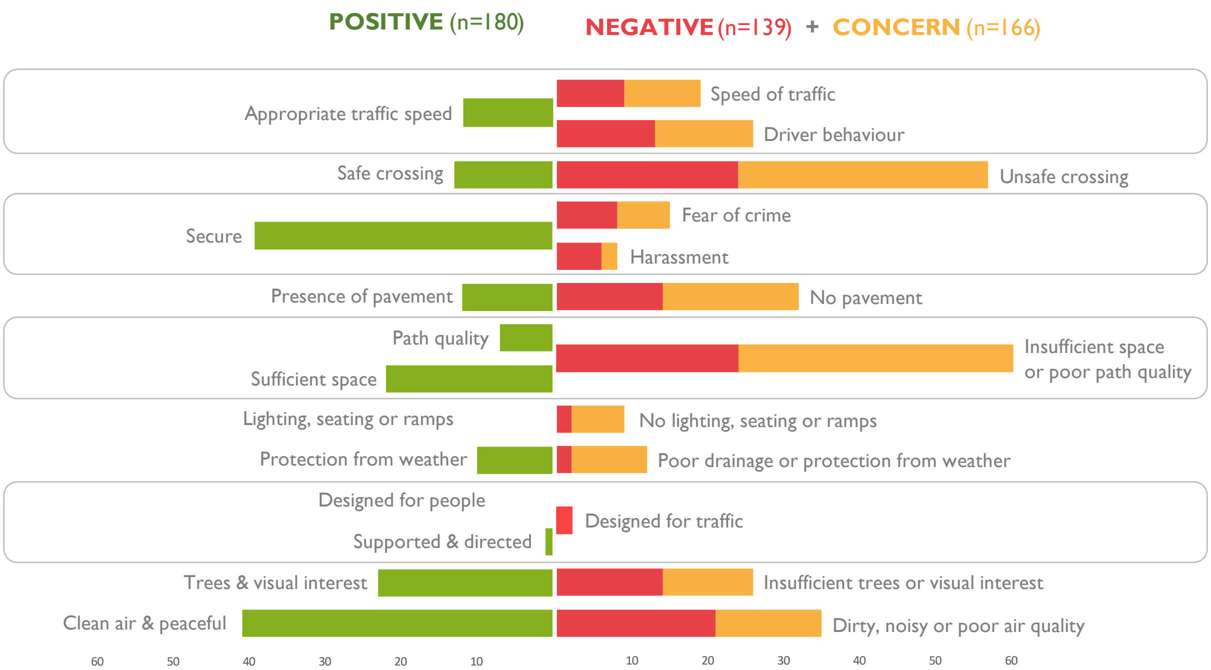


Figure 3-19 Observations linked to determinants in Bab Elkhalk

The most frequent and relevant determinant linked to negative or concerning experiences is "Insufficient Space or Poor Path Quality" (13.1%), followed closely by "Unsafe Crossing" (11.7%), and finally "Dirty, Noisy, or Poor Air Quality" (7.2%).

The two most frequent and relevant environmental determinants linked to positive experiences, in descending order, are "Clean Air & Peacefulness" (8.5%) and "Security" (8%).

Figure 3-21 Image showing vicinity of Kobri Al Azhar with less sidewalk space & fenced medians.

Figure 3-20 Image showing tertiary streets in Bab el Khalk area

In the Greater Cairo E-Bus Demonstration project, a Non-Motorized Traffic (NMT) report analyzed the state of NMT infrastructures along the designated e-bus demonstration project routes in Cairo. Within the same area, participants were asked to rate the walkability of selected street segments based on the condition of the pavement and its effective width. Results revealed that Port Said Street was rated as **"Not Walkable,"** with sidewalk fences obstructing access to the sidewalks. This primarily explains why "Insufficient Space or Poor Path Quality" received the highest scores in the area. Additional observations include the presence of cafes, kiosks, and street vendors, which serve as common social gathering spaces, as well as uneven and discontinued sidewalks.

Upon examining Figure 3-22 Maps for positive, negative & concerning experiences in Bab Elkhalk, it becomes apparent that secondary streets are more walkable compared to main streets resulting in opposing results when it comes to observations related to 'Visual Interest', 'Clean air & peacefulness'. This can be attributed to several factors including the presence of considerably narrower lanes, which are more protected & accommodate lower traffic volumes.

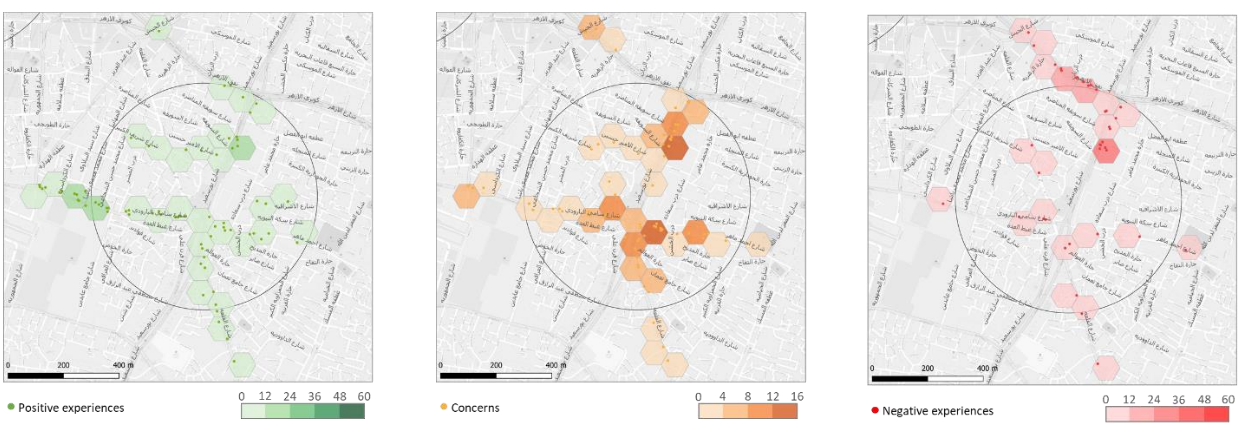
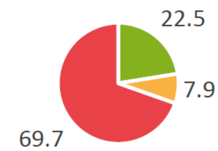


Figure 3-22 Maps for positive, negative & concerning experiences in Bab Elkhalk

3.2.1.4 Ramses Station

Looking into the 178 shared pedestrian experiences, the majority were linked to negative experiences (n=124,69.7%), followed by positive experiences (n=40, 22.5%) and concerning ones (n=14, 7.9%). Its important to note that Ramses Station is most negatively rated area from all the 8 study areas.

	N	%
Positive	40	22.5
Concern	14	7.9
Negative	124	69.7
TOTAL	178	100.1



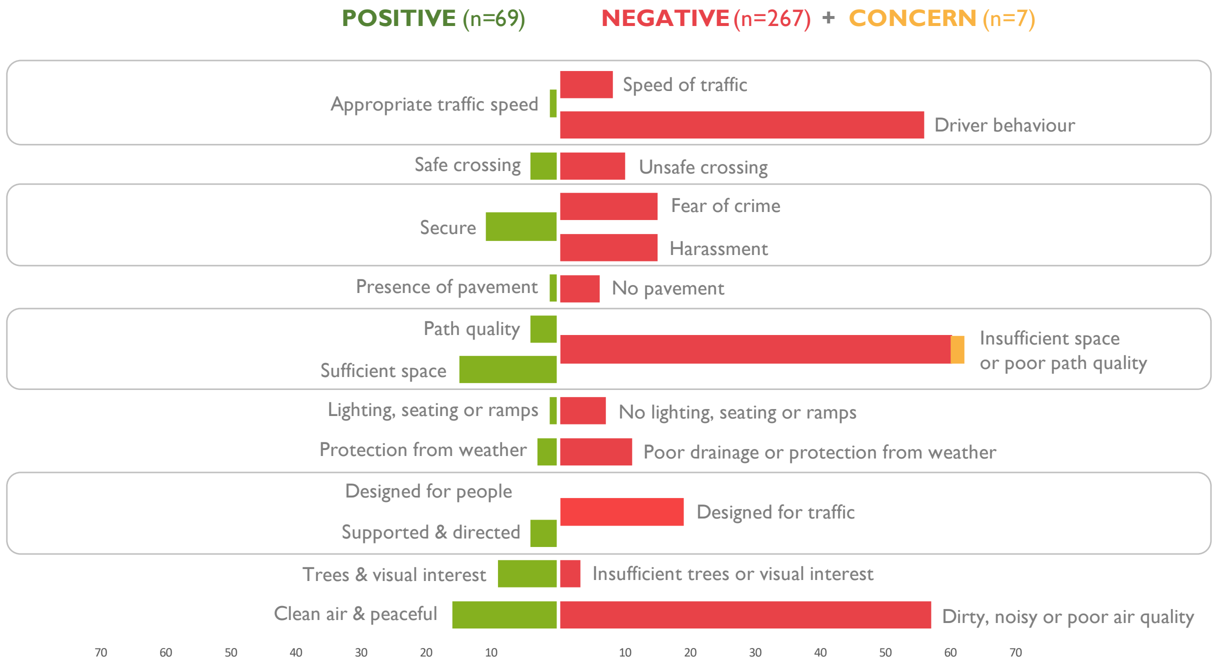


Figure 3-23 Observations linked to determinants in Ramses Station

The most frequent and relevant determinant linked to negative or concerning experiences is "Insufficient Space or Poor Path Quality" (18.1%), followed by "Dirty, Noisy & Poor Air Quality" (17.5%) and "Driver Behavior" (16.6%).

The two more frequent and relevant environmental determinants linked to positive experiences, in descending order, are "Clean Air & Peacefulness" (4.7%) and "Sufficient Space" (4.4%).

When comparing the top frequent negative determinants in Ramses Station with Alf Maskan, both areas share similarities. They are both significant interchange points where various modes of public transportation intersect, including microbuses and a metro station. The high volumes of daily commuters attract informal commercial activities, which impact cleanliness and sufficient spaces in both areas.

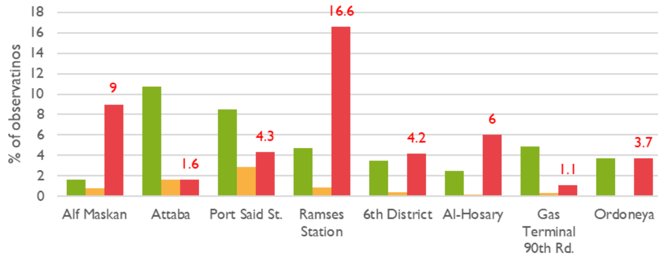


Figure 3-24 'Clean Air & Peaceful' versus 'Dirty, noisy, or poor air quality'

Figure 3-25 Street Vending activities

According to a SWOT analysis[14] conducted on Ramses Square and its surrounding area, it reveals that there is a lack of defined pedestrian paths and absence of meeting points or public spaces for activities, indicating this oversight. Additionally, the presence of an elevated highway and interconnected ramps disrupts the spatial coherence of the space creating a less mobile environment for active travelers within this area. In accordance with our study, this justifies the very high negative 'Driver Behavior' percentage which is experienced by pedestrians trying to cross the road infrastructures albeit the presence of several pedestrian bridges in such areas or walk along beside sidewalks that are encroached by vendors/shops.

Figure 3-27 Crossing Situation towards Ramses Station

Figure 3-26 Pedestrian walking on road than sidewalk

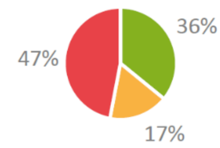
3.2.2 Outer City

3.2.2.1 Al-Hosary

[14] Transformation Through Sustainable Qualification: A Sustainable Railway Neighbourhood in Ramses Area, Gehan Nagy & Manal Elshahat, 2012

Looking into the 181 shared pedestrian experiences, the majority were linked to negative experiences (n=85,47%), followed by positive experiences (n=65, 35.9%) and concerning ones (n=31, 17.1%)

	N	%
Positive	65	35.9
Concern	31	17.1
Negative	85	47
TOTAL	181	100



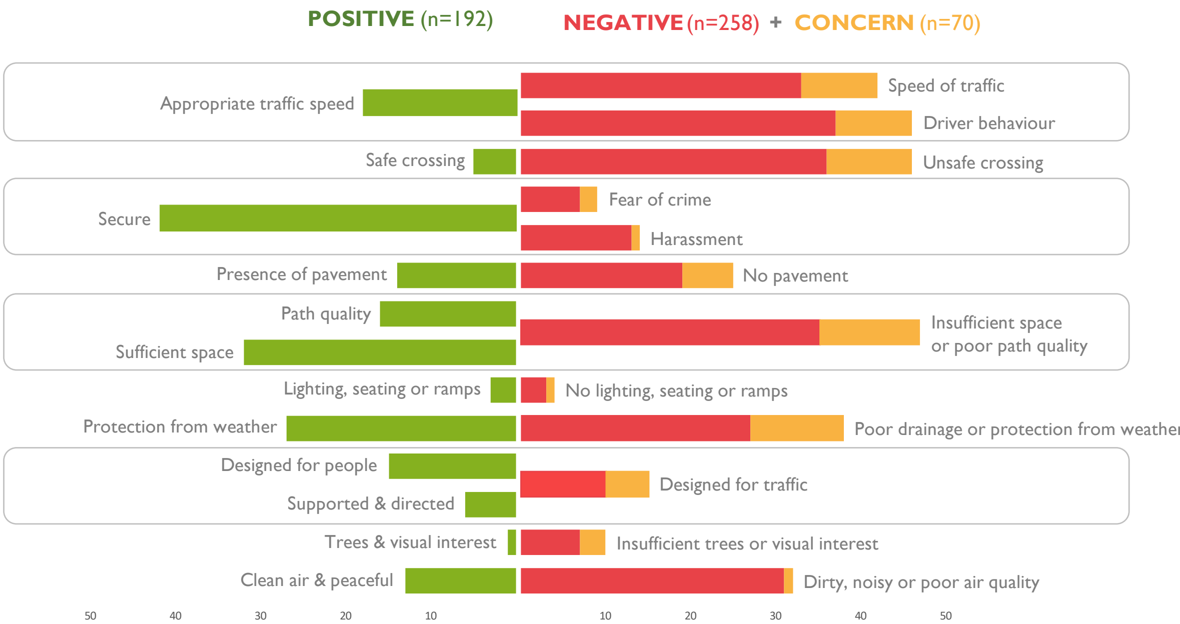


Figure 3-28 Observations linked to determinants in Al-Hosary

The most frequent and relevant determinant linked to negative or concerning experiences is "Insufficient Space or Poor Path Quality" (9%), followed closely by "Unsafe Crossing" (8.8%), "Driver Behavior" (8.8%), and "Speed of Traffic" (8%).

The three most frequent and relevant environmental determinants linked to positive experiences, in descending order, are "Security" (8.1%), "Sufficient Space" (6.2%), and "Protection from Weather" (5.2%).

Figure 3-29 Crossing situation in AlMehwar elMarkazy

Figure 3-30 Pathways designed for pedestrian in commercial complex

In a previous study by TfC to create the SUMP (Sustainable Urban Mobility Plan) for 6th of October, whereboth Al-Hosary Mosque areas & the 6th District where physically analyzed. The diagnostic of street design elements highlights issues such as inconsistent pedestrian pathways, lack of protected crossings, and inadequate pedestrian refuges. It is important to note that the street design elements were mapped before the recent construction of the monorail, which may pose additional challenges for pedestrians during the construction phase reflected through the outcomes of the environmental determinants above. The crossing situation is also closely visualized in the maps bellow. Reflecting more concentration of the negative experiences towards both the terminal station of the Hossary area & both road axes of AlMehwar elMarkazy. Positive experiences also indicate a notable concentration around the commercial complex next to 6th of Ocotber University.

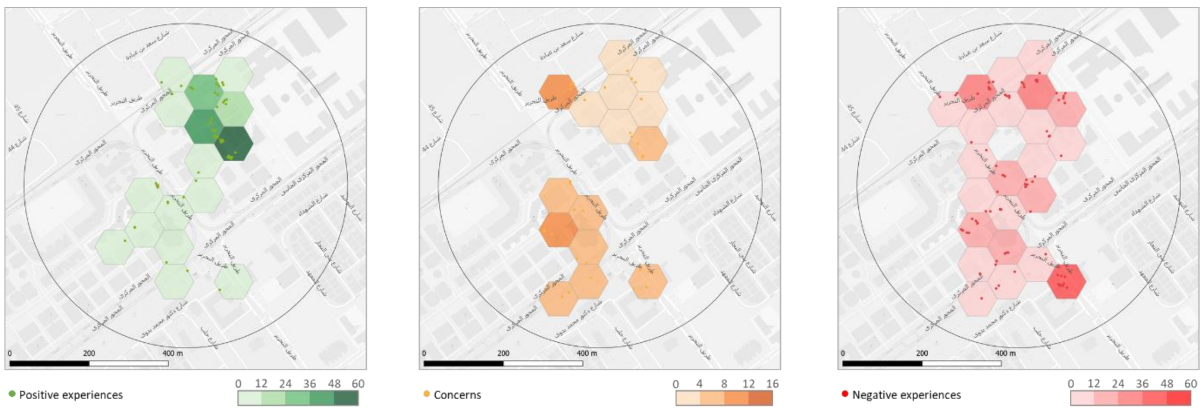
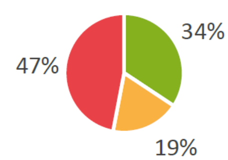


Figure 3-31 Maps for positive, negative & concerning experiences in Al Hosary

3.2.2.2 6th District, 6th of October

Looking into the 166 shared pedestrian experiences, the majority were linked to negative experiences (n=78,47%), followed by positive experiences (n=57, 34.3%) and concerning ones (n=31, 18.7%)

	N	%
Positive	57	34.3
Concern	31	18.7
Negative	78	47
TOTAL	166	100



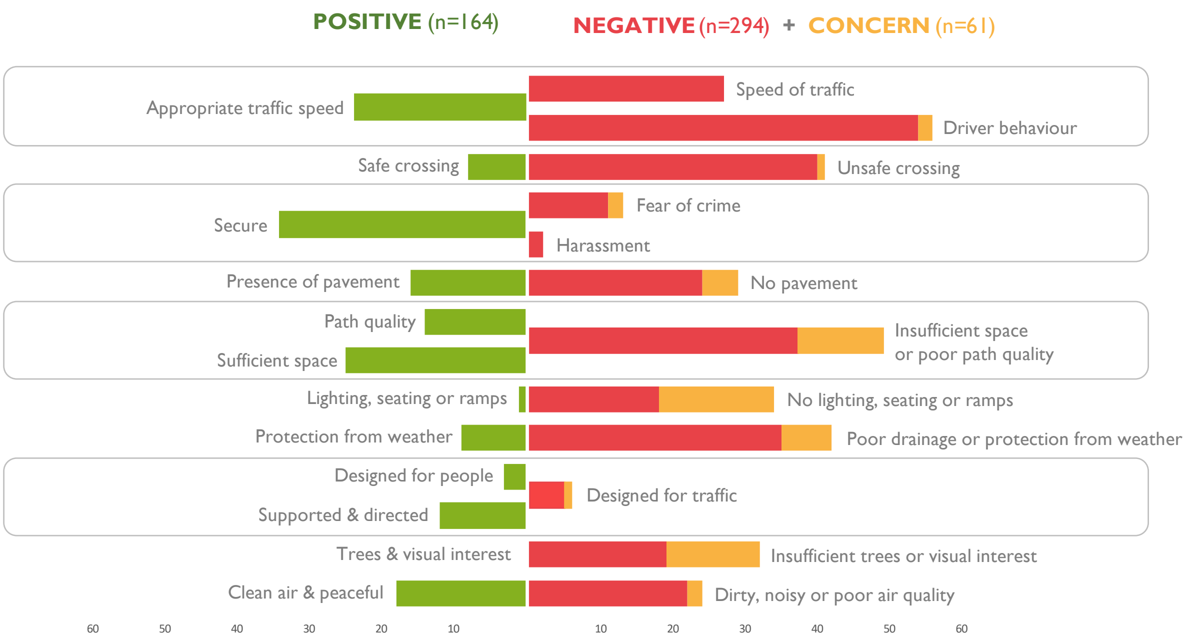


Figure 3-32 Observations linked to determinants in the 6th District

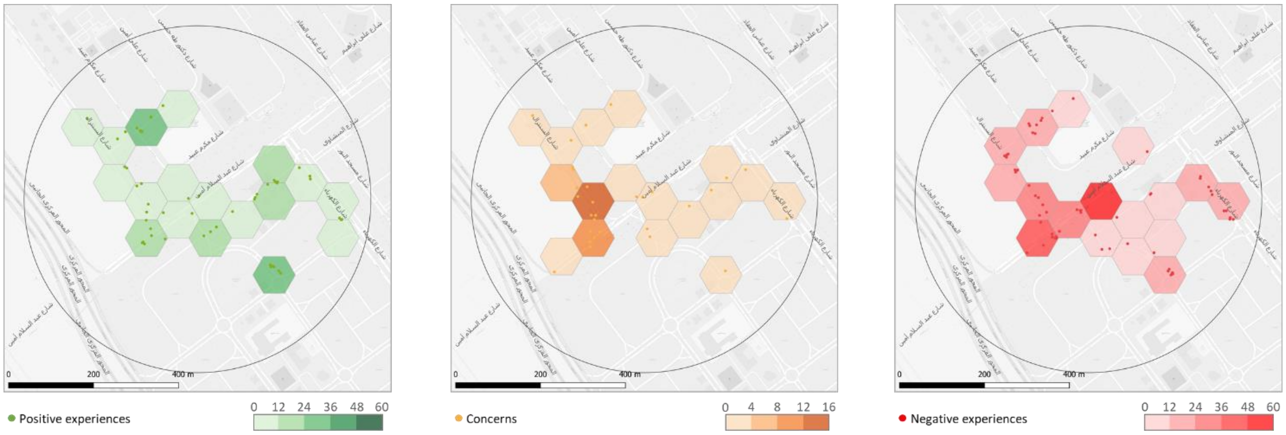
The most frequent and relevant determinant linked to negative or concerning experiences is "Driver's Behavior" (10.8%), closely followed by "Insufficient Space or Poor Path Quality" (9.4%). "Poor Drainage or Protection from Weather" (8%) and "Unsafe Crossing" (7.9%) also contribute significantly to negative experiences.

On the other hand, the three most frequent and relevant environmental determinants linked to positive experiences, in descending order, are "Security" (6.6%), "Sufficient Space" (4.8%), and "Appropriate Speed" (4.6%).

Figure 3-33 Old Market bus terminal area

Figure 3-34 Image around Eskan Mubarak showing children playing in the street

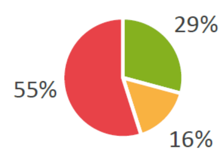
When analyzing the SUMP diagnosis for the four main axial streets in the district, several prevailing issues become evident. The streetscapes prioritize vehicles over pedestrians, resulting in inadequate footpaths and a lack of safe crossing points. The presence of traffic-generating activities within the residential area further exacerbates the problem, leading to excessive on-street parking that obstructs pedestrian access around the terminal stations & main street axes. Yet, positive experiences concetrate more in the social-housing reisdential complexes as ‘Eskan Mubarak’ surrounding this area.



3.2.2.3 Gas Terminal 90th Rd

Looking into the 113 shared pedestrian experiences, the majority were linked to negative experiences (n=33,29.2%), followed by positive experiences (n=57, 34.3%) and concerning ones (n=31, 18.7%)

	N	%
Positive	33	29.2
Concern	18	15.9
Negative	62	54.9
TOTAL	113	100



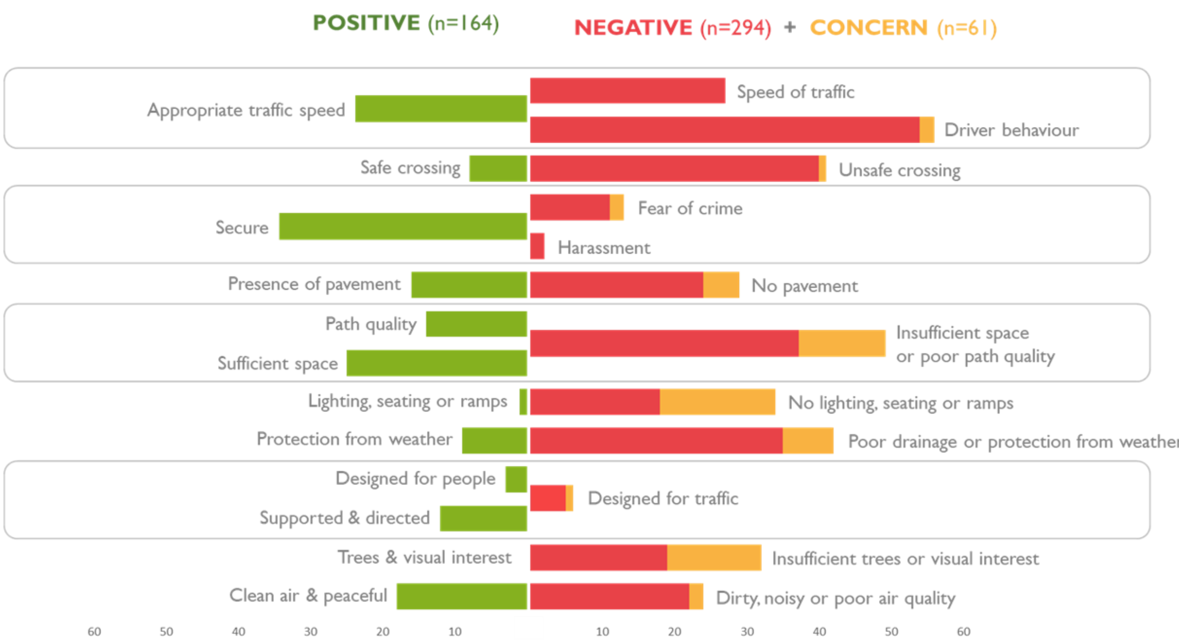


Figure 3-35 Observations linked to determinants in the Gas Terminal

The most frequent and relevant determinant linked to negative or concerning experiences is 'Poor drainage or protection from weather' (11.7%) followed by 'Insufficient Space or poor path quality' (8.9%),'Unsafe crossing' (9.1%) 'No lighting seating or ramps' (8.2%) and finally 'Insufficient trees or visual interest' (8%)

The three more frequent and relevant environmental determinants linked to positive experiences in descending weights are 'Secure' (5.4%) and 'Clean and peaceful' (4.9%)

Figure 3-36 Image showing crossing situation along South 90th road

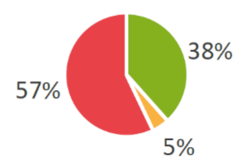
Figure 3-37 Car overtaking sidewalks or medians around commercial areas

According to Non-Motorized Traffic (NMT) report analyses and outcomes for the fifth settlement area, namely in the vicinity of the 90th road, the area posses low pedestrian flow values due to increased car-dependency, limited sidewalk accessibility due to ongoing construction and discontinued networks, fewer commercial and public uses resulting in lower street visibility, hazardous uncontrolled intersections for pedestrians, lack of shading elements, bigger block sizes that can be isolating and inhospitable for pedestrians, and reported issues of speeding, driver behavior, crashes, and congestion. Walking experience could be very daunting for both residents & employees visiting the area.

3.2.2.4 Ordoneya, 10th of Ramadan

Looking into the 198 shared pedestrian experiences, the majority were linked to negative experiences (n=113,57.1%), followed by positive experiences (n=76, 38.4%) and concerning ones (n=9, 4.5%)

	N	%
Positive	76	38.4
Concern	9	4.5
Negative	113	57.1
TOTAL	198	100



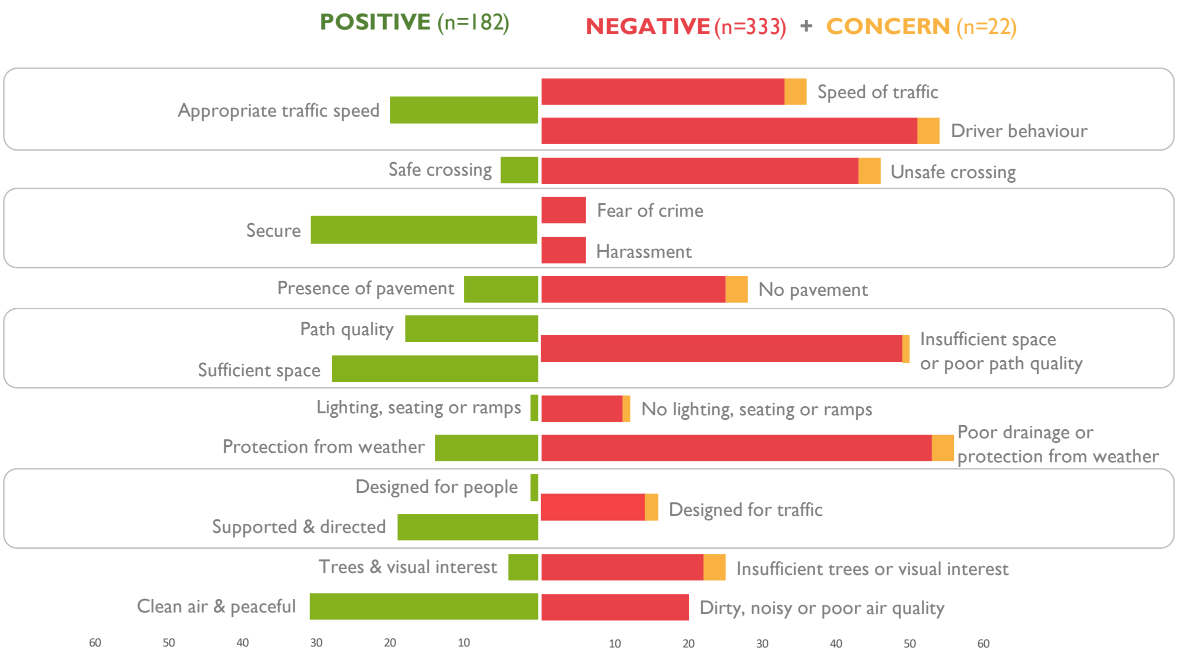


Figure 3-38 Observations linked to determinants in the Ordoneya

The most frequent and relevant determinant linked to negative or concerning experiences is 'Poor drainage or protection from weather' (10.5%) followed by 'Drivers Behavior' (10.1%) and finally 'Insufficient Space or poor path quality' (9.3%).

The three more frequent and relevant environmental determinants linked to positive experiences in descending weights are 'Clean air & peaceful' (5.8%) and 'Secure'(6.2%) and 'Sufficient Space' (5.2%)

At the Ordoneya terminal along with the Gas Terminal, the data shows the highest percentages regarding 'Protection from weather'. Interestingly, despite the presence of natural shading elements such as trees, there was a significant observation made by one of the field researchers. They pointed out that the trees, although present, were planted in inappropriate proportions. Instead of serving the primary purpose of providing shading for pedestrians, these trees seemed to be utilized mainly for aesthetic purposes on the streets and medians. This observation highlights the discrepancy between the presence of natural elements and their functional effectiveness in offering protection from weather for pedestrians.

Figure 3-39 Image showing protection from weather situation

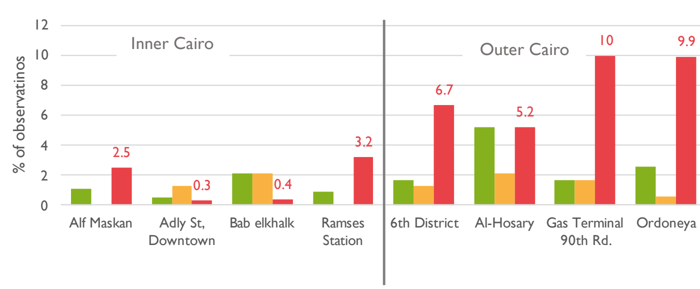


Figure 3-40 Observations related to **'Protection from weather'**

3.3 Pedestrian Safety, Comfort & Accessibility

Modal protection and retention emphasize creating an environment that ensures the safety, accessibility, and comfort of these modes to retain their existing users and attract new ones[15].

The combination of certain categories used in this walkability study can provide valuable insights into relevant walkability concepts for policy, such as pedestrian accessibility, safety, and comfort.

3.3.1 Pedestrian **Safety**

Pedestrian safety can be defined through the combination of determinants including:

- Fear of crime/Secure
- Speed of traffic/Appropriate Traffic speed
- No lighting, seating, or ramps/ Lighting, seating, or ramps
- Drivers' behavior
- Harassment
- Unsafe crossing/ Safe crossing

In terms of negative factors, **high traffic speeds** have a significant impact in the outer city locations, namely Al-Hosary (6.3%), Gas Terminal (6.3%), and Ordoneya (6.1%). This can be attributed to the wide right of way and speedy highway streets in these areas. Surprisingly, the same locations also record higher observations towards appropriate traffic speeds. This discrepancy corresponds to the diverse nature of inner secondary streets, whether in commercial or purely residential areas. The NMT Report highlights that speed control measures, such as speed bumps, in the fifth settlement are insufficient in controlling vehicle speeds, making it hazardous to cross these segments, especially considering the relatively higher number of lanes compared in such urban settings. Additionally, design guidelines recommend the inclusion of midblock crossings if the block length exceeds 250m, which is not the case for all road types.

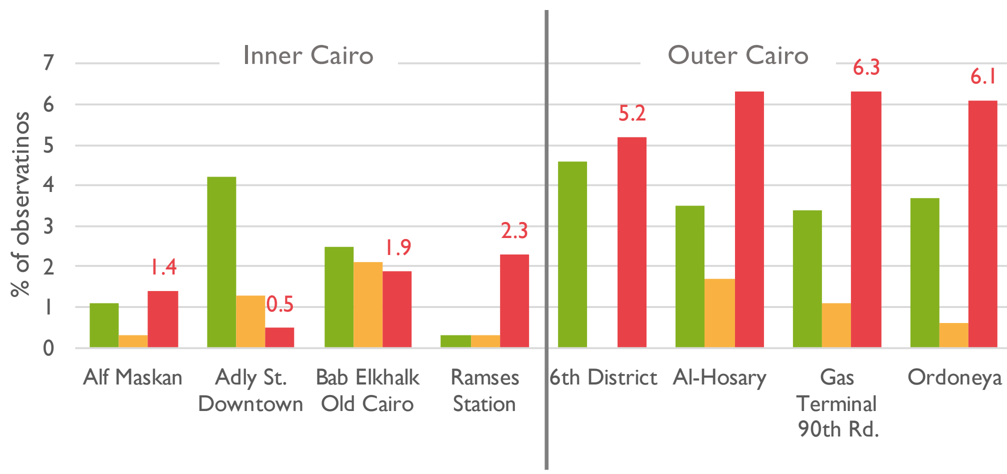


Figure 3-41 Percentages on the observations for the presence **appropriate traffic speeds and speed of traffic** in all study areas

Driving behavior, although interconnected with traffic speed, does not entirely align. For example, on the 90th road (2.3%), driver behavior is reported the least, despite traffic speed being the most reported factor. This discrepancy may be related to the presence of more informal vehicles, like tok-toks, which

[15] Walking and cycling in Africa - Evidence and Good Practice to Inspire Action, UNEP, UNHabitat & Walk21,2022

exhibit more stressful behavior towards pedestrians. Such behavior is prevalent in the 6th district (10.4%), Ordoneya (9.5%), and Alf Maskan (6.3%) areas as-well.

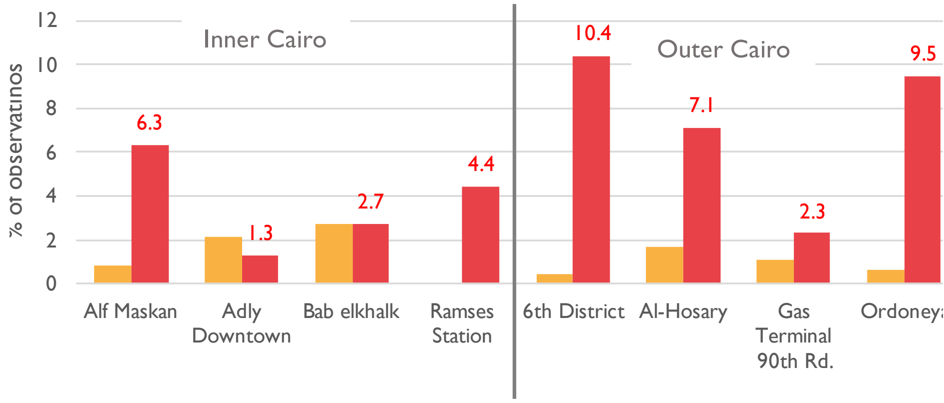


Figure 3-42 Percentages on the observations for the negative & concerning **driver behavior** in all study areas

Pedestrian safety is a major concern in the South 90th street area, with 56.8% of experiences being negative, while only 23.9% are positive in terms of safety. This area's overall perception is significantly influenced by concerns related to traffic speeds, driving behaviors, and unfavorable crossing experiences as elaborated above with these factors clustering prominently on South 90th St. and Bank Center St.

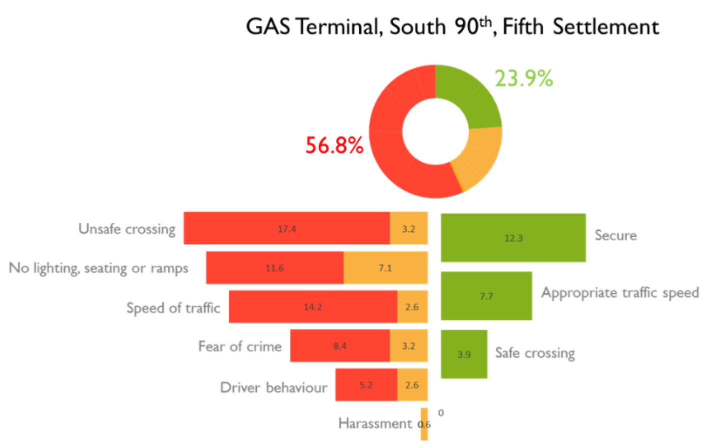


Figure 3-43 Negative experiences related to Safety

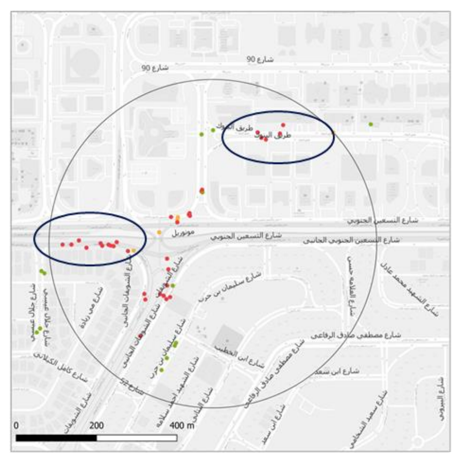


Figure 3-44 Safety attributes for South 90th in relation to traffic

3.3.2 Pedestrian **Comfort**

Pedestrian comfort can be defined through the combination of determinants including:

- Designed for traffic/Designed for people.
- Dirty, noisy, or poor air quality/Clean & peaceful
- No lighting, seating, or ramps/ Lighting, seating, or ramps
- Poor drainage or protection from weather/ Protection from weather
- Insufficient trees or visual interest/Trees & visual interest
- Insufficient space or poor path quality/Sufficient space & path quality
- Supported and directed.

Pedestrians reported the highest rating for 'sufficient space and good path quality' in Alf Maskan, but simultaneously rated it the lowest for the same category. This contrasting result can be attributed to the well-designed Heliopolis neighborhood, which is adjacent to the less formally planned Ain Shams area. In Ain Shams, street vendors dominate the narrow inner streets, impeding people from walking freely and disrupting their comfort towards terminal stops. Similarly, Adly St in Downtown scored the highest for Comfort levels, consequently for attributes related ‘Clean & peaceful’, ‘Path Quality’, and ‘Trees & Visual Interest’, achieving 64% of positive comfort levels in this area. This can also be attributed to the pedestrian dedicated pathways existing in this area as well as the provision of bus shelters in transit stop areas.

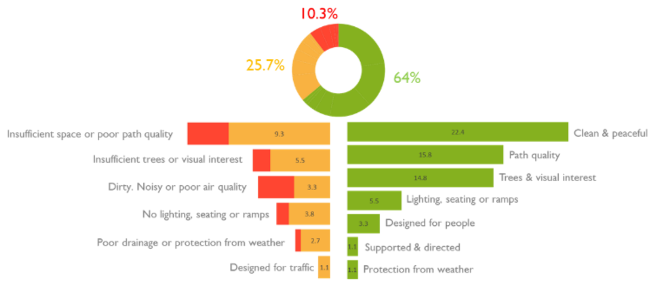


Figure 3-45 Comfort levels for Downtown

Figure 3-46 Dedicated pathways & bus shelters in Downtown

Another area that received the highest report for 'insufficient space and poor path quality' is Ramses station. Consequently, it was also voted as 'designed for traffic' rather than for pedestrians. The lack of defined pedestrian paths and the presence of elevated highways further emphasize the focus on accommodating traffic rather than pedestrians. Furthermore, the stark difference between the inner and outer locations highlights how pedestrians prioritize protection from the weather as a main source of comfort.

The low-rise planned areas and coarse-grained blocks, coupled with the absence of shading elements, create more challenging walking conditions, especially when commuting large distances towards sparse transit stations. This reflects the very low comfort levels in Gas Terminal (25.7%). In contrast, denser areas are usually characterized by self-shaded spaces and cooler environments, making walking more desirable and less problematic in inner city regions. Additionally, more pedestrians reported that the surroundings were 'clean and peaceful' despite the high activity and crowdedness, which could lead to the opposite consequences. Inner locations also garnered more interest for their trees and visual appeal.

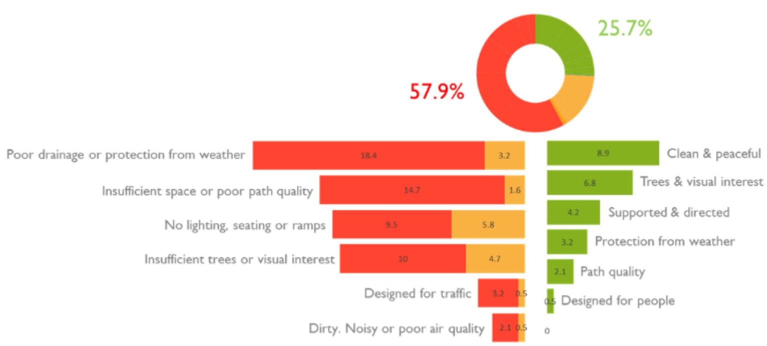


Figure 3-48 Comfort levels for the fifth settlement

Figure 3-47 Image showing Gas terminal lacking seating or shading elements

Despite the car-oriented nature of all satellite cities, pedestrians are most receive 'supported and directed'. Network analysis on the directness and linearity of these networks proves that they possess uninterrupted pathways, creating a continuous and seamless network for pedestrians to navigate easily within each neighborhood. However, the lack of visual interest diminishes visual access and the sense of orientation too.

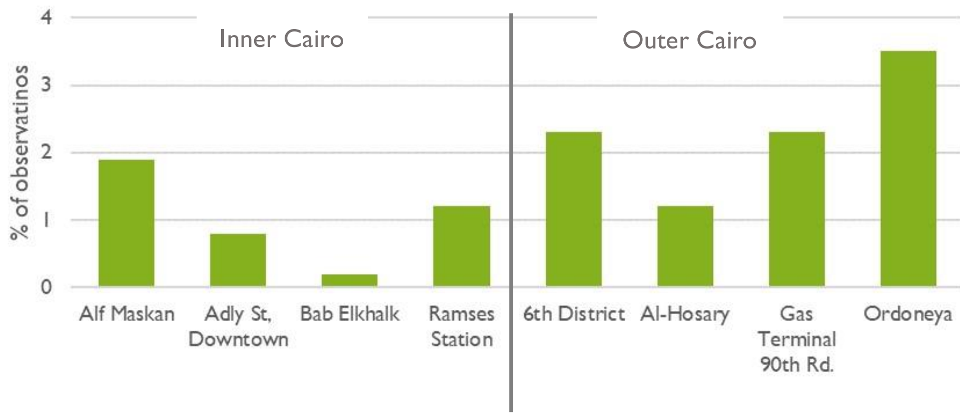


Figure 3-49 Percentages on the observations for the **supported and directed areas**.

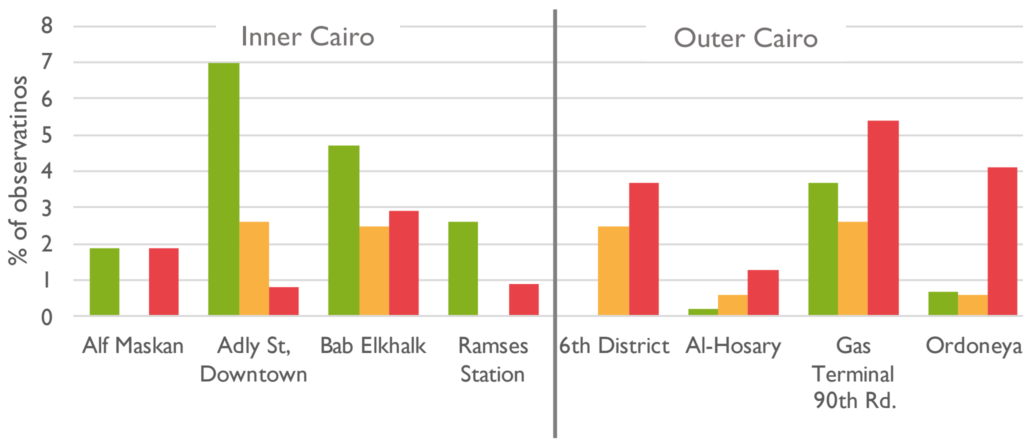


Figure 3-50 Percentages on the observations for the presence or absence of **trees & visual interest** in all study areas

3.3.3 Pedestrian **Accessibility**

Pedestrian accessibility can be defined through the combination of determinants including:

- Insufficient space or poor path quality/Sufficient Space
- No path/ The path
- No lighting, seating, or ramps/ Lighting, seating, or ramps
- Unsafe crossing/ Safe crossing

The percentage of negative experiences related to the 'absence of pavement' is consistently higher in the outer city areas compared to the inner-city areas. Consequently, concerns regarding 'unsafe crossing' situations are more prevalent within these same outer city areas. The NMT Report indicates that most intersections lack proper traffic signs, resulting in spontaneous crossings by pedestrians at any location along the segment. This pattern of crossing is influenced by the length of the blocks and is further explained by the coarse-grained planning structure and mega-block style prevalent in most NUCA cities.

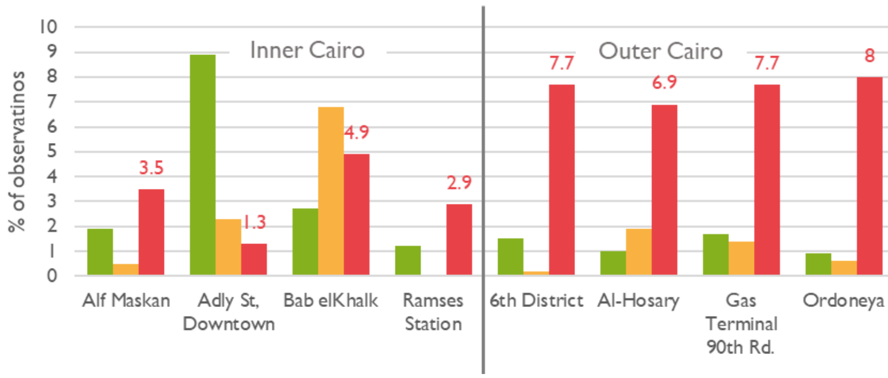


Figure 3-51 Percentages on the observations for the presence of **safe or unsafe crossings** in all study areas

Interestingly, 'pavement' and 'crossing issues' do not seem to be the most influential problems in the inner-city locations. However, within the inner-city regions, the Portsaid Street area stands out as the most problematic, while the vicinity of Ramses Station exhibits the highest negativity in the overall study. In contrast, Downtown showcases the highest positive observations, specifically in terms of the 'presence of pavements' and 'safe crossings'. This is further exemplified when assessing the overall accessibility in the Downtown area, rated up to 63.7% accessible. In downtown, accessibility is enhanced with features like a limited number of lanes (not exceeding 4), curb cuts, consistently even and high-quality sidewalk paving, and broader sidewalks typically exceeding 150m in width.

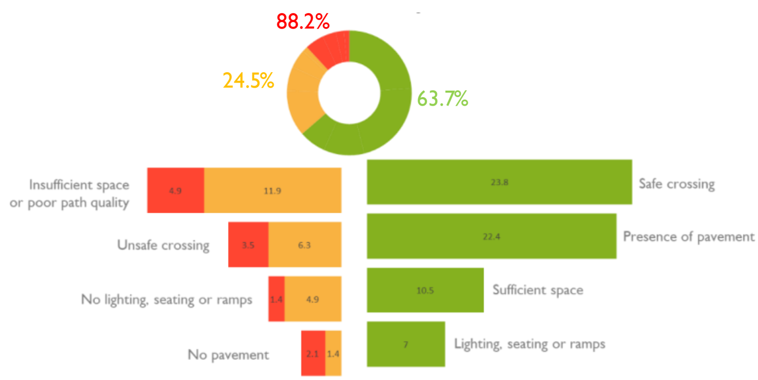


Figure 3-53 Accessibility levels in Downtown

Figure 3-52 Image showing curb cuts designed for wheelchair access

The presence of street furniture, such as 'lighting, seating, or ramps', presents the most negative and concerning observations in the Gas Terminal area (5.1%), followed by the 6th district (3.5%). In line with the NMT report, inner city areas have more pedestrian-oriented lighting poles in the streets compared to the outer city areas. Additionally, the density of public entrances is higher in the inner city, illuminating the streets further than in outer-city areas.

Furthermore, the absence of street furniture, paving, and safe crossings significantly hampers pedestrian access in the outer city areas. The lack of proper infrastructure and amenities in these areas poses challenges for pedestrians and impedes their ability to navigate and access essential services.

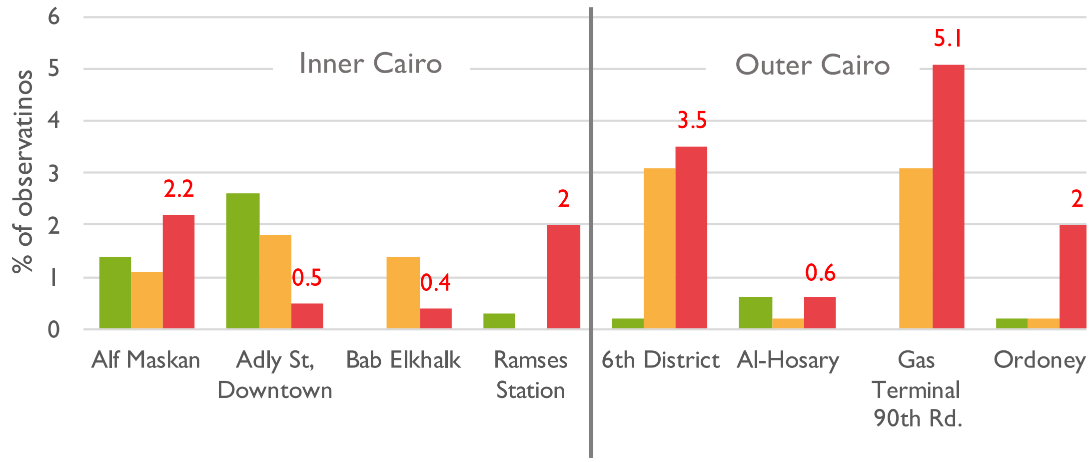


Figure 3-54 Percentages on the observations for the presence or absence of lighting, seating, or ramps in all study areas.

4 Conclusions & Focus Group Discussion Recommendations

4.1 Walkability App User perception assessment conclusions

Based on the walkability app results, the following section summarizes the main issues that deter people from walking in both inner city and outer city study areas.

The following table concludes both the prevailing positive and negative experiences that concern pedestrian walkability towards main transit points in each area:

<table>
<tr><th></th><th>Areas</th><th>(+) Positive Experiences</th><th>(-) Negative Experiences</th></tr>
<tr><td rowspan="4">Inner</td><td>Alf Maskan Square</td><td>Primarily related to "Path Quality," "Sufficient Space," and "Security."</td><td>Mainly due to "Insufficient Space or Poor Path Quality."</td></tr>
<tr><td>Adly St, Downtown</td><td>Focused on "Security," "Clean Air & Peacefulness," and "Safe Crossings."</td><td>Primarily concerning "Insufficient Space," affecting pedestrian comfort.</td></tr>
<tr><td>Bab elkhalk, Moski</td><td>Centered around "Clean Air & Peacefulness" and "Security."</td><td>Related to "Insufficient Space or Poor Path Quality," "Unsafe Crossing," and "Dirty, Noisy, or Poor Air Quality."</td></tr>
<tr><td>Ramses Station</td><td colspan="2">Mainly due to "Insufficient Space or Poor Path Quality," "Dirty, Noisy & Poor Air Quality," and "Driver Behavior."</td></tr>
<tr><td>Outer</td><td>Al-Hosary, 6th of October</td><td>Focused on "Security," "Sufficient Space," and "Protection from Weather" in particular spots.</td><td>Primarily related to "Insufficient Space or Poor Path Quality," "Unsafe Crossing," and "Driver Behavior."</td></tr>
</table>

	6th District, 6th of October	Mainly related to "Security," "Sufficient Space," and "Appropriate Speed."	Centered around "Driver's Behavior," "Insufficient Space or Poor Path Quality," "Poor Drainage or Protection from Weather," and "Unsafe Crossing."
	Gas Terminal 90th Rd, New Cairo	Focused on "Security" and "Clean and Peaceful Environment."	Primarily due to "Poor Drainage or Protection from Weather," "Insufficient Space or Poor Path Quality," and "Unsafe Crossing."
	Ordoneya, 10th of Ramadan	Mainly centered around "Clean Air & Peacefulness," "Security," and "Sufficient Space."	Related to "Poor Drainage or Protection from Weather," "Driver's Behavior," and "Insufficient Space or Poor Path Quality."

The study shed light on critical factors influencing pedestrian experiences, safety, comfort, and accessibility. However, several limitations were encountered during the analysis. One primary challenge was the limited options available for the environmental determinants, with feedback from field researchers often varying widely. Context-specific determinants further complicated the analysis, highlighting the need for nuanced interpretations.

A crucial aspect of this study involved the interplay between objective and subjective evaluations of walkability. While objective measures provide a foundational understanding, subjective evaluations, such as those obtained through the Walkability App, proved invaluable. These subjective insights revealed pedestrian priorities and barriers, particularly emphasizing thermal comfort, a vital consideration in Cairo's extreme summer conditions. Integrating both subjective and objective analyses emerged as essential for a comprehensive understanding of pedestrian attitudes, enabling more targeted policy actions and urban planning strategies.

Moving forward, this study underscores the need for future research to explore the reciprocal causality between attitudes and perceived walkability. Longitudinal data capturing these relationships will be pivotal in understanding how behaviors and environments influence one another. Further capturing of this data in public transit catchment areas based on the different physical urban settings, mobility options & individual needs, provides more potential in evaluating the integrity of public transportation systems that signifies to be a valuable tool for urban planning & addressing prevailing issues. Additionally, the study advocates for the continued use and enhancement of the Walkability App. By encouraging the participation of diverse community members, the app can serve as a valuable tool for ongoing data collection and analysis.

Furthermore, the findings from this research present actionable insights for future urban planning initiatives. Encouraging programs that focus on enhancing the public realm, promoting walking, and improving public transportation systems can significantly contribute to the overall walkability of urban spaces. These initiatives align not only with the goal of creating pedestrian-friendly environments but also with broader objectives related to climate change mitigation and low-carbon recovery measures. By fostering walkable cities, we can create healthier, more sustainable urban environments, ultimately benefiting both residents and the planet.

4.2 Recommendations from Walkability App Results

Cairo has to shift focus from private motorized infrastructure to investing in public transport and NMT infrastructure. There is an almost unanimous agreement from respondents that air quality in inner Cairo desperately needs to improve. This factor doesn't only affect walking but any other form of active travel as well. This is a well-known vicious cycle of motorization effects incentivizing more motorized transport.

To realistically achieve this in Cairo: (a) there must be more strict regulation on the vehicle conditions and adoption of international standards to quantify emissions from vehicles. (b) Regulation of public transport services to prevent the standard "over-supply" problem of unregulated paratransit services. Finally (c) investments in private cars incentives (e.g., the ongoing construction of multi-story car garages, widening of roads, replacement of public squares with highways and overpasses) must slow down and give way/funding to -basically- reverse time, when Cairo had a decent tram coverage[16] and street design was more inclusive. Quantifying impressions from the city's pedestrians is a great tool to advocate this cause.

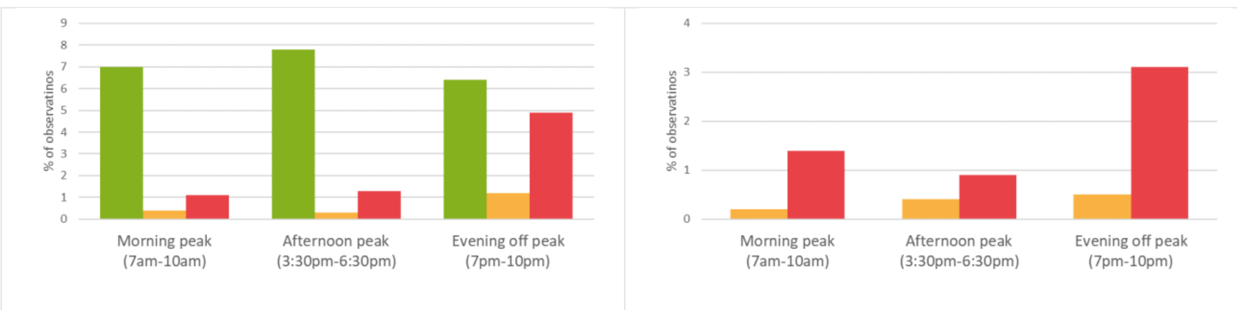
Introducing the following set of laws and guidelines aimed at facilitating minor adjustments, these measures aim to enhance walkable experiences. Moreover, the proposed principles & data acquired in this study analyzes location-specific data, with extended study, paves the way for the development of tailored solutions and design guidelines to further develop walkable environments within these study areas.

The proposed guidelines offer solutions towards 4 main prevailing issues highlighted in the study: [1] Lack of lighting [2] Protection from weather [3] Unsafe crossings & [4] Insufficient space & poor path quality. Solutions could be adopted & enforced by local authorities such as the Cairo governorate.

4.2.1 Lack of lighting

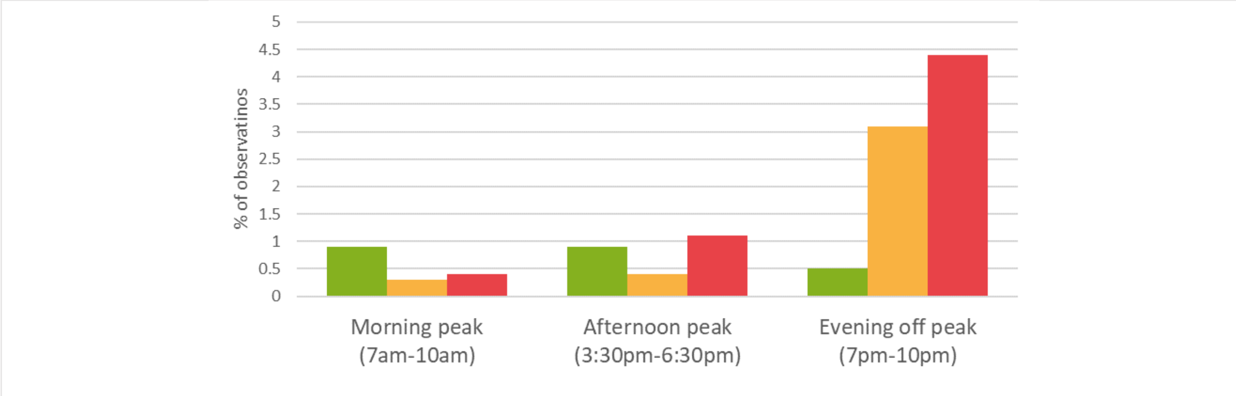
All outer city locations surveyed require adequate lighting infrastructure_to be installed and maintained. Even though the surveyed locations in outer cities were relatively busy public transport interchanges, negative impressions on harassment and security increase significantly in the evening off-peak period (7 – 10 PM).

As Figure 4-1 shows, when cross comparing all variables in received data disaggregated by time, it is noticeable that there is a linear relationship between the independent variable "Lighting, seating or ramps" and two dependent variables "Harassment" and "Security". Therefore, addressing lighting issues in said locations is the straightforward, quick-win solution to help mitigate these issues reported.



(a) (b)

[16] https://egyptianstreets.com/2019/08/01/a-quick-run-down-of-cairos-demolished-heliopolis-tram/



(c)

Figure 4-1: Observations disaggregated by time period (a) Security (b) Harassment (c) Lighting, seating or ramps.

4.2.2 Protection from weather

Outer city areas, including critical locations like Gas terminal and Ordoneya terminal, should receive enhanced weather protection, identified as a top priority during the morning peak hours. This initiative is particularly vital for pedestrians traveling to work or destinations necessitating extended walks across exposed streets to reach bus stops or terminals. The challenge intensifies near vast commercial and corporate complexes, where the extensive block sizes make adverse weather conditions even more challenging for pedestrian comfort.

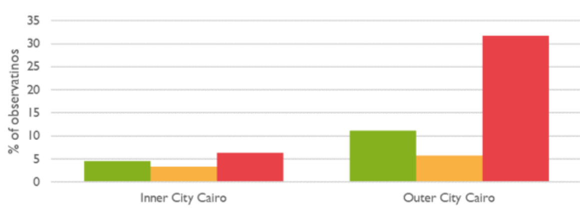


Figure 4-2 Observations regarding need for protection from weather in inner versus outer cities

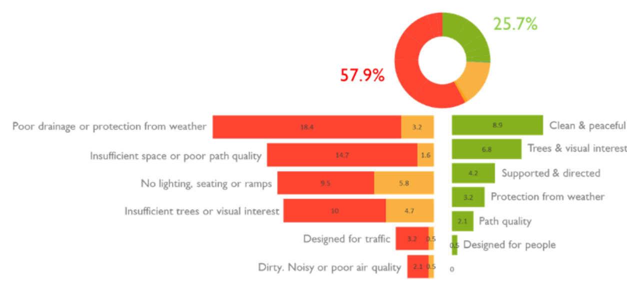


Figure 4-3 Sense of Comfort in Gas Terminal, mostly dominated by lack of protection from weather conditions.

Proposed solutions as guidelines:

- Implement ordinances mandating developers and enterprises to integrate measures safeguarding paths, sidewalks, and walkways from adverse weather conditions impacting pedestrians.
- Ensure weather protection by incorporating canopies or awnings on ground-level structures to shield sidewalk travelers. Alternatively, promote the plantation of trees and vegetation along trails and walkways.[17] Take into account local conditions and water scarcity issues when selecting trees; opt for varieties that can withstand arid climates and strategically position them to offer maximum shade, prioritizing functionality over decorative purposes.

[17] https://sustainablecitycode.org/brief/protecting-public-spaces-from-weather-conditions-2/

- Encourage smaller enterprises and commercial property owners by providing low-interest loans as part of a revitalization effort. This initiative aims to incentivize the improvement of store frontages and the provision of facilities, enhancing the overall streetscape and promoting pedestrian-friendly environments[18]

4.2.3 Unsafe Crossings

Spontaneous pedestrian crossings marked by minimal enforcement of formal traffic regulations threaten pedestrian safety in several study areas. Pedestrians also noted that 'drivers' behavior' in areas such as Ramses Station make walking even more difficult. General lack of respect for pedestrians by drivers, at least partially brought about by lack of enforcement of laws governing pedestrian right-of-way.

Figure 4-4 Crossing situation in 90th st. Photo taken from a nearby overpass.

Figure 4-5 Crossing situation in the vicinity of Ramses Station.

To address these problems, proposed solutions must be tailored to specific street typologies, pedestrian capacity, and locations:

- Implement stricter enforcement: Enforce stricter speed limitations and impose increased penalties for traffic violations in areas with heavy pedestrian traffic.

- Introduce traffic calming measures: Install traffic calming measures like speed bumps and raised crossings in pedestrian-heavy zones such as Ramses Station and Interchange stations. Additionally, raise drivers' awareness by adding flashing pedestrian signals at midblock locations. Although this doesn't necessarily make crossing easier, it enhances pedestrians' visibility.

- Explore Alternative Crossing Points: In areas where at-grade crossings are unfeasible, such as the 90th street corridor in the fifth settlement, the lack of facilities persists. The situation improves only when on-grade crossings are physically blocked to utilize over-pass bridges. Despite the current challenges posed by the monorail construction, it could offer an opportunity. By

[18] Planning and implementing pedestrian facilities in suburban and developing rural areas, Transportation research committee.

generating more crossing points, pedestrians might perceive these as safer options, encouraging them to utilize these crossings.

- Strategic Bus Stop Placement: Identify high-traffic pedestrian areas and strategically place bus stops or terminals near existing crosswalks and signalized intersections/overpasses[19]. Ensure these stations are well-connected and accessible from both sides of the road. This approach facilitates safe and convenient pedestrian crossings, integrating public transportation into the overall pedestrian safety strategy.

4.2.4 Insufficient space & poor path quality

Insufficient or poorly maintained paths are often found in bustling market areas like Moski, where informal commercial activities spill onto the streets. Currently, pedestrians often have to share the roads with cars, leading to safety concerns. To address these issues, several proposed solutions have been suggested:

- Dedicated Vending Zones: Establish specific vending zones near transportation stations. Create partnerships with vendors, requiring them to maintain cleanliness in these areas. Formalize the arrangement through state recognition and licensing mechanisms. Vendors must adhere to regulations, ensuring a mutually beneficial relationship. [20]

- Zero-Tolerance for Sidewalk Encroachments: Adopt a strict zero-tolerance policy against sidewalk encroachments. Remove all temporary and permanent obstructions that force pedestrians onto the carriageway.

- Implement Pedestrian-Friendly Zones: Designate certain areas as pedestrian-friendly zones, restricting vehicular access during specific hours whenever feasible. Improve pavements and extend them to incorporate vending zones, ensuring a seamless and safe walking experience. Enhance these zones with amenities such as benches and proper lighting, further encouraging pedestrian activity and safety.

Amidst Cairo's large-scale infrastructure projects, there lies an opportunity to introduce creative methods that enhance walkable environments, promoting sustainable mobility in the city. The Walkability App transforms abstract challenges into tangible, evidence-based actions, enabling precise solutions. By capitalizing on these opportunities and insights derived from crowdsourced data, we can develop comprehensive plans and reactive interventions. These strategies not only address the rapidly evolving urban landscape but also align seamlessly with long-term development plans, contributing significantly to our broader goal of achieving a more sustainable environment and mitigating climate change. This iterative process, enabled by the Walkability App, ensures continuous evaluation of implemented initiatives, enhancing the city's walkable environments and reinforcing our commitment to a greener, more sustainable future.

4.3 Focus Group Discussions

[19] Safe Urban Form: Revisiting the Relationship between Community Design and Traffic Safety, Eric Dumbaugh & Robert Rae, 2009

[20] Lagos Non Motorised Transport Policy, ITDP, 2018

On October 7, 2023, **two focus group discussions** were conducted on the margin of the seminar "Unlocking the Potential of Walkability in the Greater Cairo Region: Insights from the Walkability App crowd-sourced data." Each focus group included 8 members, a moderator, and two facilitators.

The first focus group discussion included representatives from **civil society organizations**, such as non-profit organizations and social enterprises in the sustainable mobility field, such as Cairo Bike, Go Bike, Tabdeel, Heliopolis Heritage Foundation, Ahmed El Seidi Law Firm, and The Nada Foundation, as well as a participant from UN-Habitat.

The second focus group discussion included a**cademics with backgrounds in urban planning and architecture** from think tanks and universities, such as Cairo University.

The focus group discussions were designed to elicit insights from a diverse group of stakeholders on the challenges and opportunities for improving walkability in the Greater Cairo Region. The discussions were also intended to inform the development of a new walkability strategy for the region.

4.3.1 Findings from the first focus group discussion of the Civil Society representatives

The main Challenges:

In many Egyptian cities, walkability is not prioritized. This is due to several factors, including a focus on car-centric transportation planning, a lack of coordination between government agencies and civil society, road safety status, Personal safety threats, crowdedness, over-lighting, and over-activity make the experience more anxious sometimes, and a lack of awareness of the benefits of walkability.

The questions for the civil Society group:

- What are some of the most effective ways to advocate for walkability improvements?
- How can NGOs collaborate with government agencies to implement walkability-friendly policies and programs?
- What are some specific ways to engage the public in walkability advocacy and planning?

Findings from the focus group discussion:

The focus group discussion with NGO representatives revealed a number of specific recommendations for improving walkability in Egypt. These recommendations include:

1. **Advocate for walkability as a purpose in itself**: Rather than simply as a means of transportation. This will help to raise the profile of walkability and make it a more important priority for decision-makers.
2. **Use digital advertising to target the audience and locations**: This will help to ensure that their messages are seen by the people who are most likely to be interested and influenced by them.
3. **Highlight pedestrian rights**: Civil society organizations should focus on advocating for pedestrian rights in infrastructure design, such as safe zebra crossings, pavements, trees, shading, and water accessibility. This will help to make walking a more attractive and viable option for people.
4. **Develop skills for communication with decision-makers:** This includes understanding the decision-making process and being able to communicate their messages concisely.
5. **Work on the finance aspect and the solution before addressing decision makers**: This will help to show decision-makers that walkability is a feasible and affordable option.

6. **Encourage the private sector to participate in walkability initiatives**: This can be done through corporate social responsibility programs and other partnerships.
7. **Localize the terminologies to Arabic**: This will make the concept more relevant and understandable to the ordinary citizen.
8. **Localize the narrative**: Civil society organizations should localize the narrative of walkability to the specific challenges and opportunities in Egypt. This will help to make the concept more relevant and engaging to the public.
9. **Provide more attention to education and raising awareness**: Especially among children and youth. This will help to create a new generation of walkability advocates.
10. **Focus on personal safety of pedestrians:** This includes addressing issues such as harassment, which can prevent women and girls from walking.

Conclusion:

The recommendations from the discussion provide a valuable roadmap for civil society organizations, government agencies, and the private sector to work together to create more walkable communities.

4.3.2 Key findings from the second focus group of the Researchers and Academia representatives

Research questions on walkability in Egypt:

The focus group discussion with academia and researchers representatives identified a number of important research questions on walkability in Egypt, including:

- How can we design infrastructure to create a safe space for walking?
- How can we promote government collaboration in adopting a walkability promotion strategy?
- How can we move beyond the deficient view of economic costs related only to traffic flow and start to consider the social costs of traffic fatalities, people unable to make active trips, and the large portion of income spent on commuting instead of other expenses?
- How can we collect data on the current state of walkability before implementing projects, and how can we launch projects first and then collect data to assess and refine them?
- How can we promote walkability for those who don't walk, and how can we give more attention to those who already walk and promote a safer space for them with better conditions?
- Why are people obliged to walk, and can this obligation be turned into a choice?
- How can we develop a Walkability app that recommends places that are more walkable, based on assessment criteria developed from user input?
- How can we assess government spending and civil society funding on walkability promotion?
- How can we use government statements that affirm the centrality of health to mobilize and advocate for walkability promotion?
- How can we promote walkability in parallel with advocating for a better transportation system?

Discussion:

The focus group discussion also raised a number of important points for discussion, including:

1. The importance of asking science-based real questions that arise from sincere observations and provoke the researcher to investigate them devoutly.
2. The need to consider the social costs of traffic fatalities, people unable to make active trips, and the large portion of income spent on commuting instead of other expenses.

3. The question of whether to collect data on the current state of walkability before implementing projects, or to launch projects first and then collect data to assess and refine them.
4. The issue of social class/social justice, and how the exclusivity of different neighborhoods requires a separate analysis of needs.
5. The importance of using government statements that affirm the centrality of health to mobilize and advocate for walkability promotion.
6. The need to promote walkability is in parallel with advocating for a better transportation system.

Conclusion:

The findings from the discussion will help to inform future research and policy development on walkability in Egypt. This means more attention will be diverted from the standard research on traffic optimization and car-centric designs to pedestrian infrastructure and walkability.

Academic and scientific contributions:

The findings from the focus group discussion contribute to the academic and scientific literature on walkability in a number of ways. First, the study provides insights into the specific research questions that need to be addressed in order to improve walkability in the context of a developing country. Second, the study identifies a number of promising strategies for promoting walkability, considering the social costs of traffic fatalities and people unable to make active trips, and using government statements that affirm the centrality of health to mobilize and advocate for walkability promotion. Third, the study highlights the importance of considering social class/social justice in walkability advocacy.

5 Appendix

5.1 Glossary of terms included in the Walkability App

5.1.1 Pedestrian profile

5.1.1.1 **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.

* I prefer not to say

5.1.1.2 **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).

* I prefer not to say

5.1.1.3 **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.

* I prefer not to say

5.1.2 Walk context

5.1.2.1 **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).

* I prefer not to say

5.1.2.2 **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.

* I prefer not to say

5.1.2.3 **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.

* I prefer not to say

5.1.2.4 **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.

5.1.3 Pedestrian Experience

Positive experiences (Green icon)

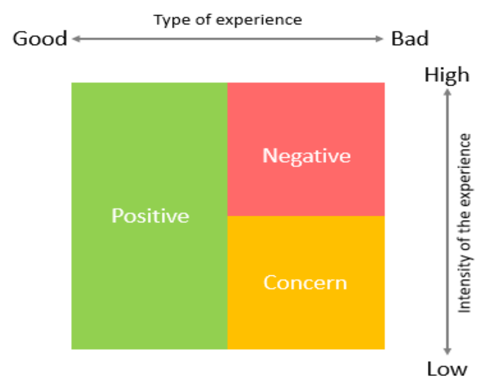
Positive pedestrian experiences while walking and interacting with the environment. The positive experiences may be related to the ease of walking in the area, as well as a positive personal sense of safety, comfort, pleasantness (and vibrancy) of the environment.

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.

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.

5.1.4 Environmental determinants

5.1.4.1 Linked to positive experiences

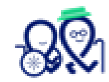
Appropriated (traffic) speed. The traffic speed in the area is appropriate and not considered a threat or danger by pedestrians. Example: a street in which traffic moves slow enough so that pedestrians can make eye contact with the drivers.	

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.

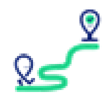
The area is equipped with street furniture and infrastructure to cater for pedestrian accessibility, safety and comfort. Apart from lighting, seating and ramps, this category may include bins, public fountains and toilets, etc. (But participants/surveyors need to use the comments to add them or specify 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.

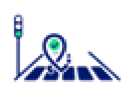
The area is equipped with street furniture and infrastructure to protect pedestrians from harsh weather conditions, such as extreme heat and cold, rain, wind, humidity etc.

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.

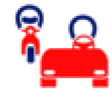
Example: a street with trees, a square with traditional architecture.

5.1.4.2 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.

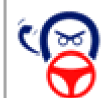
The area is polluted with litter, odour, air or noise pollution.

Example: a street with litter. A street with air and noise pollution from traffic.

Driver (bad) behavior

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

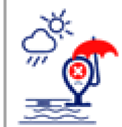
The area is not equipped with street furniture and infrastructure to cater for pedestrian accessibility, safety and comfort. Apart from the lack of lighting, seating or ramps, this category may refer to bins, public fountains and toilets, etc. (But participants/surveyors need to use the comments to add 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)	

5.1.4.3 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.