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Surveying the Impacts of Flyover Projects on Heliopolis Identity Based on Users' Satisfaction

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Abstract Many cities worldwide are losing their unique identities due to new urban and architectural developments. Heliopolis, a district in Egypt, is currently undergoing this transformation, particularly with the introduction of flyovers aimed at alleviating traffic congestion and improving traffic flow. While these developments enhance transportation efficiency, they threaten the district's visual identity, safety, privacy, and overall quality of life for residents. This paper explores the physical, visual, environmental, economic, and social factors shaping Heliopolis' character. It evaluates the experiences and perceptions of various stakeholders—residents, commuters, and urban planners—before and after the urban transformation. Data gathered through an online questionnaire revealed significant shifts in community attachment and perceptions of the district's image. The study reveals conflicting opinions on the transformation and highlights the need for urban design that integrates modern infrastructure with the preservation of historical and cultural identity. It suggests that urban planners incorporate community feedback to foster sustainable and inclusive development while emphasizing the balance between cultural heritage and modern needs. A vital limitation of the study is its focus on a single district, which may not fully capture broader urban trends. However, the findings stress the importance of integrating community input to achieve sustainable development and preserve cultural heritage amidst infrastructure changes.

Keywords City Identity, Urban Identity, Flyovers, Heliopolis Transformation

1. Introduction

Cities change over time; cities shape their inhabitant's values and outlooks in various ways [1,2]. A powerful asset of any city is its identity [3]. In many cities, identity may be changed as a natural outcome of time and many other aspects. To improve city identity, all citizens, not just governments, need to build a strong city identity and enhance the city image perceived by the whole world [4]. A city identity enhances many essential aspects of our life, like the city's cultural level, educational level, and economic prosperity cities [5]. Numerous flyovers and street expansions have been constructed in cities to enhance traffic flow. While flyovers are commonly perceived as transportation infrastructure, they extensively influence urban dynamics and the populace they serve [6,7]. International literature has extensively documented these impacts, suggesting that flyovers engender social, environmental, and economic consequences. Notably, some of these effects possess significant potential to address community needs [8-11].

In Egypt, the complexities associated with population growth and transportation have escalated recently, necessitating an expansion of vehicular infrastructure, such as flyovers, to address Egypt's ongoing traffic challenges. Egypt's urban plans throughout the last 50 years have centred on extending and developing road networks to the point where Egyptians refer to it as the "era of roads and

bridges". Bridge construction has been a priority in Egypt's urban agenda since 1970, helping to tackle various traffic issues. This study addresses two key questions:

- To what extent did the urban transformation in Heliopolis affect the residents' and visitors' vision, attachment to the district, and modes of mobility?
- What are the resident's and visitors' levels of satisfaction after the development projects?

The topic of new development projects and their effects on city identity is widely discussed in literature [12,13]. However, there is a gap in the literature of studies examining these effects from the users' perceptions. In the same context, limited studies on the case of big Egyptian cities investigate the impact of the new development of flyovers on city identity and user satisfaction. This gap in the literature is notable as understanding users' perceptions is crucial for comprehensive urban development planning and decision-making. User perspectives offer valuable insights into how these projects are experienced daily and how they shape the city's lived environment. Moreover, considering the unique context of big Egyptian cities, where rapid urbanization and infrastructure development are significant features, there is a pressing need to explore the specific impacts of flyover development on city identity and user satisfaction.

Researchers can uncover nuanced aspects of the relationship between infrastructure development and city identity by focusing on user perceptions [14]. This includes examining how individuals interact with and adapt to changes in their urban environment and the socio-cultural implications of these transformations. Additionally, investigating user satisfaction provides essential feedback for policymakers and urban planners to ensure that development projects align with the community's needs and preferences.

This study aims to explore factors addressed in the literature concerning flyover projects in Heliopolis. In this study, we aim to examine factors shaping Heliopolis' identity and the impacts of development projects, including flyover construction, based on user satisfaction.

To reach this aim, we analysed responses from an early 2023 online questionnaire to ensure context-specific insights reflecting neighbourhood needs. The expected outcomes are to identify positive and negative effects and understand community perceptions and adaptations. Additionally, we seek to understand how these changes influence residents' and visitors' behaviours, perceptions of the city, attachment to the district, and overall satisfaction.

Exploring Heliopolis' development through flyover construction and street expansion, this article investigates how these improvements influence inhabitants' attachment to the neighbourhood and means of mobility. Theoretically, this study delves into identity, place-making, and how urban development influences city identity. Employing a qualitative research design, the study utilizes surveys conducted in early 2023 to reveal the significant implications of flyovers on the city's identity, which influences physical, social, and environmental variables.

This study hypothesizes that the recent urban developments, particularly the introduction of flyovers in Heliopolis, have significantly altered the district's visual identity, safety, and community attachment. These changes are expected to reflect conflicting views among residents, commuters, and urban planners regarding the balance between modern infrastructure and the preservation of cultural heritage.

Addressing the present research gap requires a multi-disciplinary approach integrating urban planning, sociology, psychology, and other relevant fields. This is crucial as it allows us to capture the complexity of urban development processes and provide comprehensive insights. By doing so, we can contribute to more sustainable and inclusive city planning practices, leading to more informed decision-making and the development of strategies that prioritize the well-being and satisfaction of city residents.

2. Literature Review

In the 1960s, architects and urban planners explored city identity in various dimensions, from physical structures to social dynamics and emotional resonance [15]. Lynch's seminal work defined city identity as recognising a place's uniqueness intertwined with its structure and meaning. He emphasized the role of the physical environment in shaping a city's imageability, highlighting elements like paths, edges, districts, nodes, and landmarks [16].

Norberg-Schulz further emphasized how people contribute to a city's identity through culture and lifestyle. City identity encompasses diverse physical, socio-economic, cultural, historical, and spatial components influencing its formation and development. Morphological dimension underscores how design, form, colour, and spatial connections contribute to a city's distinctive character. Ultimately, these elements establish a city's identity, reflecting its unique essence and fostering a sense of place among its inhabitants.

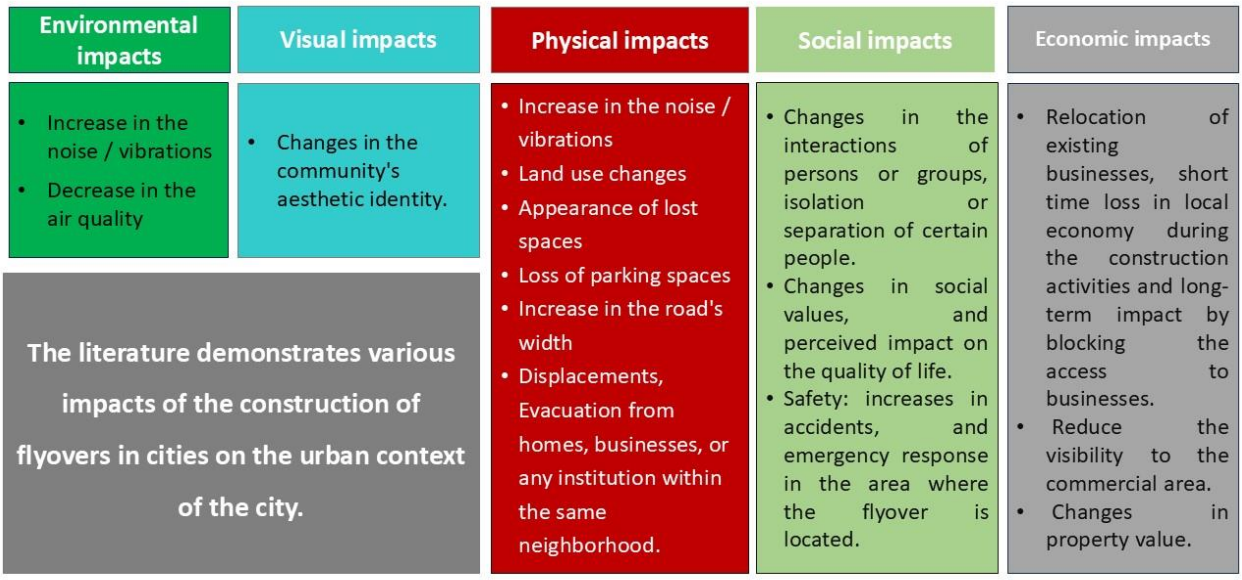
Place-making is the philosophy and practice of designing locations that promote community involvement, cultural identity, and a sense of belonging [17]. Jane Jacobs emphasized the necessity of mixed-use development, pedestrian-friendly streets, and spontaneous urban expansion. Jacobs defied standard urban planning knowledge, pushing for neighbourhoods that value human connection and diverse social activities over large-scale infrastructural projects. Similarly, Jan Gehl focuses on the human scale of cities, highlighting the need for public places that facilitate social meetings and promote active lives. Furthermore, William H. Whyte's essential work on the social life of small urban places has shed light on the mechanics of public interaction and the architectural

principles that foster vibrant public life [18]. Research has also formed the fundamental concepts of place-making theory, highlighting the inherent link between urban design, social behaviour, and the development of liveable, inclusive communities [19,20]. Various ideas continue to influence modern approaches to urban planning, motivating designers and policymakers to prioritize the human experience in creating cities [5,21].

Since the 1950s, as automotive culture grew, all the requirements for urban planning have been altered. Cities had to accommodate the culture of vehicles quickly. As a result, extensive roadway and transport network expansion was needed to support the rapidly expanding vehicle culture. The idea of highways was first proposed, and then elevated urban highways were added. Researchers' interest in urban highways and flyovers and their impact on urban fabric has become prominent in academic and popular culture writings because city planners believed that the congested, slow-moving streets of the city were not the ideal option for fast cars. This part focuses on the main terminologies of mobility infrastructures. It also shows the evolution of the mobility infrastructures over time, where flyovers were introduced as a form of development to the period planners recognized its negative effect on the urban areas [7]. Flyover is commonly used to describe the flyover structure, and overpass is the intersection between two roads in which one road is raised over the other.

Between the 1930s and 1960s, urban planners advocated elevated highways as a comprehensive solution to urban issues, aiming to improve accessibility and alleviate traffic congestion. However, introducing private vehicles without corresponding infrastructure increased pedestrian traffic and safety concerns. Flyovers were proposed to segregate vehicles from pedestrians, envisioning a safer environment with reduced accidents and pollution. Between the 1970s and 1980s, the urban movement revived with projects, shifting the perception of elevated highways from symbols of success to symbols of decay and suppression.

The literature discussed above affirms that flyovers induce neighbourhood disconnection, offer undesirable vistas, and function as physical and psychological barriers, detracting from pedestrian experiences [20]. Moreover, flyovers generate vacant spaces within urban settings, exacerbating issues of city blight [21]. The visual quality of flyovers can significantly influence the perception of urban spaces, impacting both residents and visitors. Studies have shown that the design and aesthetics of flyovers can contribute to feelings of isolation, fragmentation, and even fear [22-24]. The consequential impacts of flyovers on the city's urban fabric are depicted in (Figure 1).



Source: The authors.

Figure 1. The impact-of flyovers on city context

3. Methods

3.1. Case Study

By the dawn of the 20th century, Cairo experienced a swift population surge. This growth spurred two distinct transformations in the city: the densification of existing districts established in the 19th century and the emergence of new neighbourhoods and suburbs [21]. Among these new developments is Heliopolis, established in 1905 by Baron Empain, representing a distinctive urban fabric of the 20th century. Heliopolis initially embodied the ideals of garden cities, offering convenience, liveability, and regeneration. However, this ideal state was short-lived. Over time, Heliopolis experienced waves of significant changes in its social dynamics, urban character, and economic landscape. During this period, Heliopolis emerged as a highly desirable residential destination, leading to a notable surge in its population.

Heliopolis was one of Cairo's wealthiest and most prestigious neighbourhoods, founded by Baron Empain and his business partner Boghos Nubar Pasha. The Belgian architect Ernest Jasper was hired to create a design concept for the city [25]. The new suburb's planning was influenced by the popular garden city concepts in England and added a distinctive architectural style. Baron Empain wanted Heliopolis's city architecture to resemble Islamic styles. It was designed with eight percent of its area reserved for public gardens, parks, and playgrounds. This had an impact on the suburb's urban characteristics as well as its social and demographic activities. It was designed to be greener, cleaner, and less congested. The planning objective was to create a pedestrian- and vehicle-friendly oasis in the middle of the desert, with an environmentally friendly electric tram linking it to Cairo in the west, which was 12 kilometres away. The site chosen, despite being desert, offered the advantages of being safe from Nile floods and well-ventilated by winds.

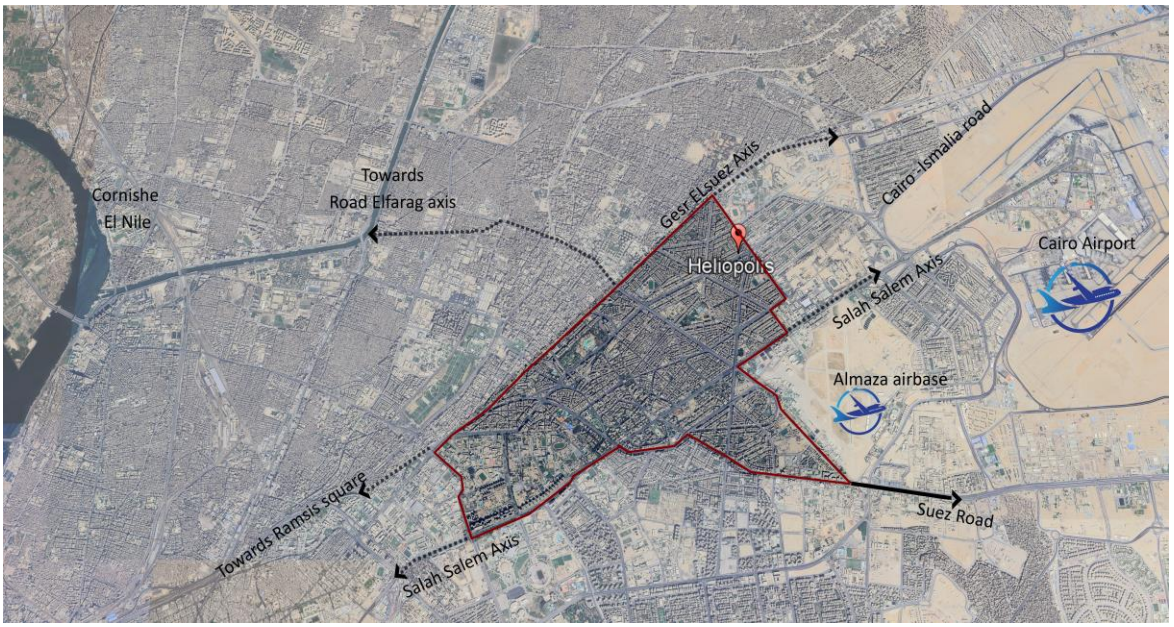
It has one of its most significant gateways, which borders Cairo on the East and is a welcome area for visitors worldwide. Cairo International Airport was a distinctive feature of the city, as were the capital's entrances from Ismailia and Suez roads (Figure 2). It is distinguished by its inhabitants' highly developed social and cultural fabric.

Howard's theories of the garden cities and Paris served as another inspiration for Heliopolis' urban planning. Wide open roads connected landmarks like the Basilica, Baron Palace, and Heliopolis Palace Hotel, which served as their landmarks. Urban connections in the city were foreign and primarily influenced by what had just been made in Paris [26] (Figure 3). The street network in the historical part of Heliopolis is exciting. Two different types of streets can be distinguished. First, that serves the communication only. These are the straight streets with perpendicular crossings, and second, where the roads are curved and radial organized. Four types of streets were introduced:

- Type 1: Streets on the borders of Heliopolis, 30–40 meters wide, always green in the middle.
- Type 2: Streets separating zones in Heliopolis, 20–25 meters wide, green in the middle.
- Type 3: Venues between city blocks, their size depends on the length varying between 11.5 and 19 meters.
- Type 4: Locks inside the block for local traffic are 10 meters wide.

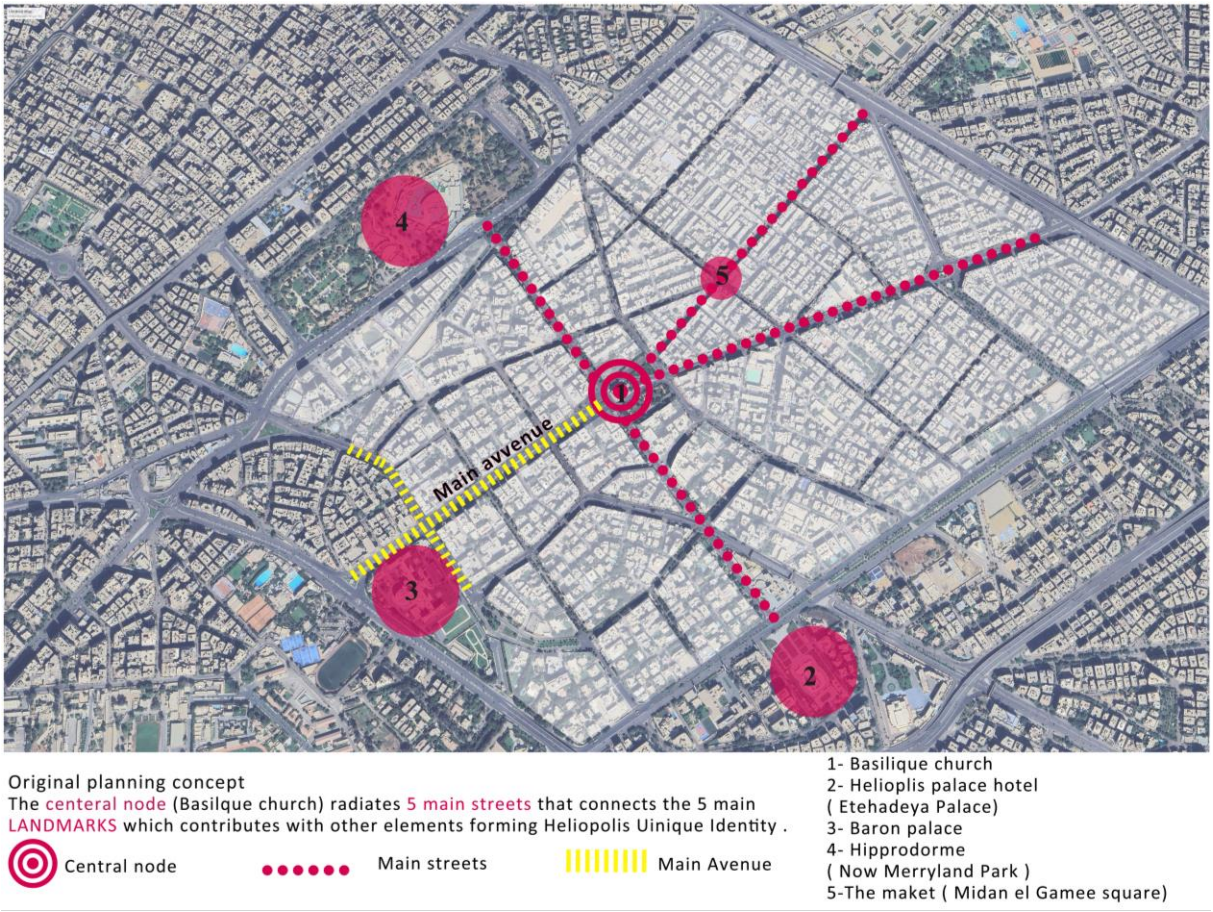
The concept was to present the buildings' finely elaborated facades to the bypassing cars' passengers. It is interesting that by designing these streets in 1905, the car perspective was considered. Empain and his design team seem to have already anticipated Heliopolis's development and the car industry.

However, with the implementation of the traffic axis development plan by September 2019, the neighbourhood underwent a rapid and significant number of urban changes. Heliopolis appears to be losing its architectural and urban characters and distinctive aesthetic and environmental characteristics [4,27,28]. This urban development initiative primarily improves vehicular traffic flow by constructing new flyovers and widening streets [25] (Figure 4 and Figure 5). However, these interventions have disregarded the original layout of Heliopolis. The geometric design of Heliopolis squares evolved from circular shapes to accommodate the city's radial-concentric grid. Typically, these squares featured a central element such as a significant building, public space, or tramway, a defining characteristic of Heliopolis. Additionally, these squares served as open nodes radiating a network of streets throughout the city. Consequently, their original form has been altered through modifications to the city's plot pattern [21].



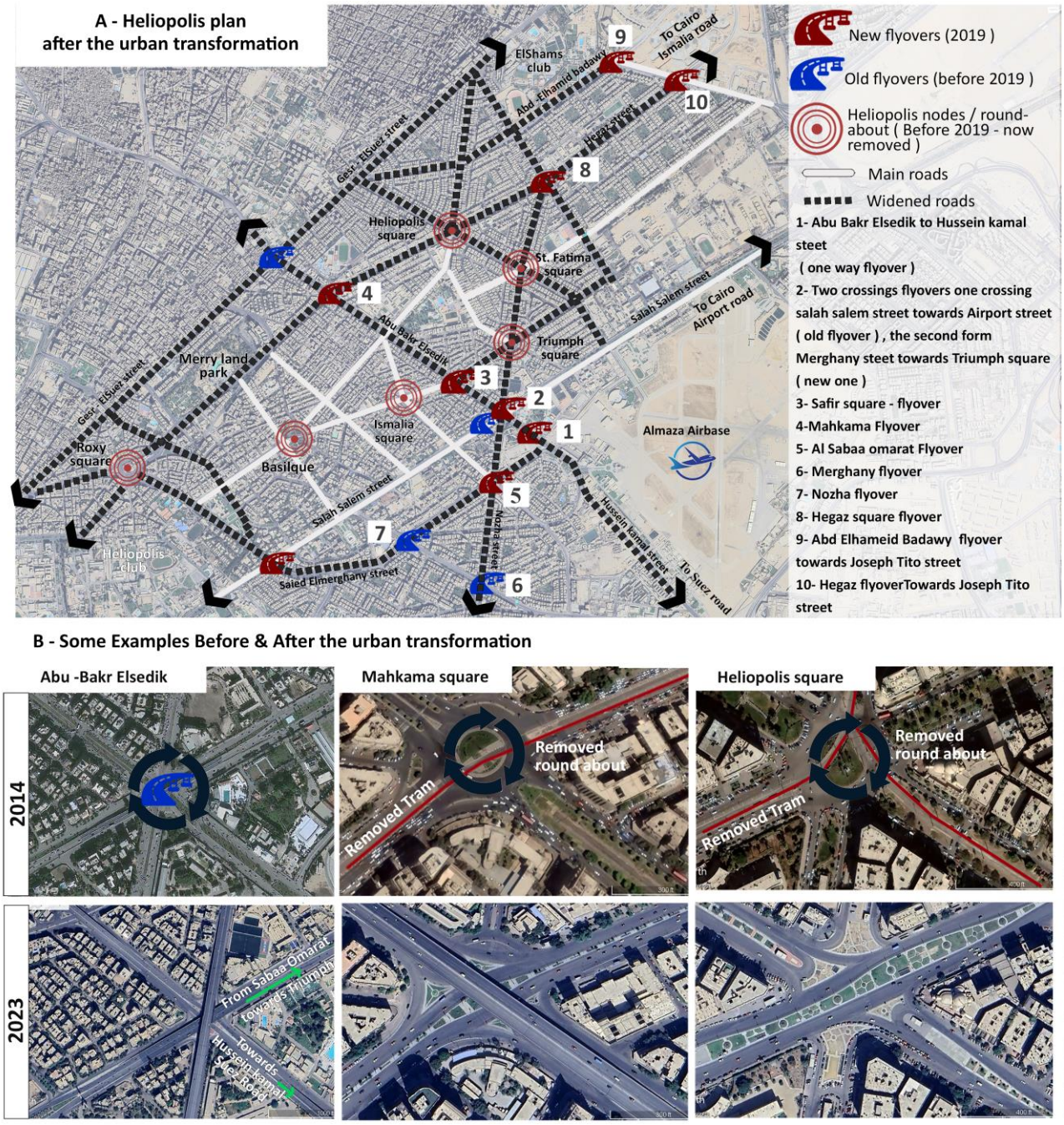
Source: authors based on Google Map

Figure 2. Heliopolis' location within Cairo



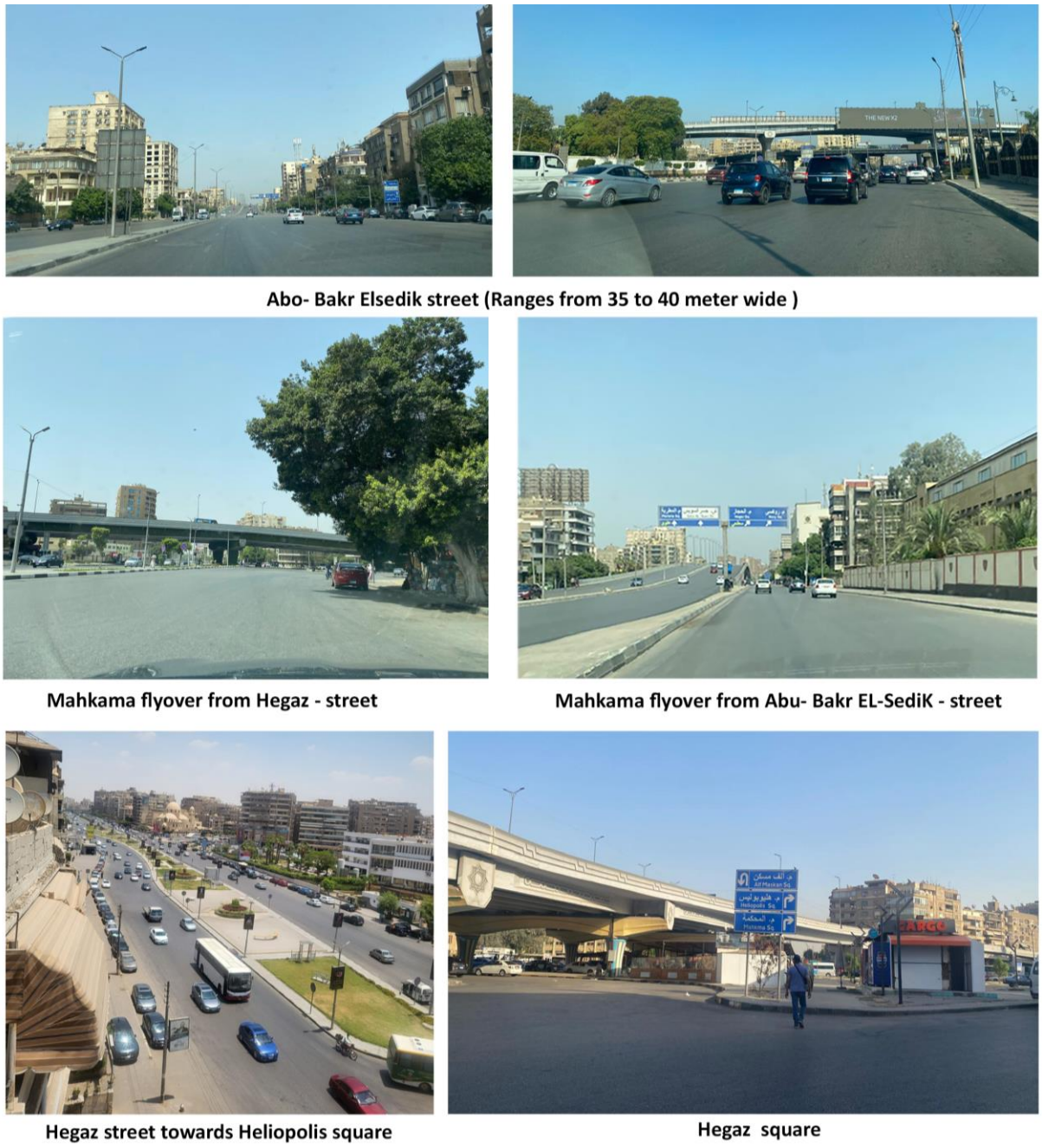
Source: The authors are based on Google Maps

Figure 3. Heliopolis' original planning concept



Source: The authors based on Google Map

Figure 4. (A) Map showing Heliopolis neighbourhood plan after the urban transformation, (b) snapshots from Google Maps between the past and the present showing the complete change in the urban fabric



Source: the authors

Figure 5. Some photos of Heliopolis streets show the streets widening after the urban transformation

3.2. Data Collection

Quantitatively, the questionnaire was launched online to random samples from local communities and visitors of different genders and ages, targeting 100 responses. The authors designed and reviewed the questionnaire[1]. Also, it was sent to an engineer's group on WhatsApp. This survey aimed to evaluate their satisfaction towards the new developments and whether it impacted their daily life or their behaviours in means of mobility, walkability, and attachment to the place. Our survey consisted of three sections.

The first section investigated the demographic structure to determine the different ages and types of community users and their characteristics. The questions asked were as follows:

- What is your age group?
- What is your relationship to Heliopolis?
- What is your job?

[1] The survey questionnaire can be tracked through Google using through the following link: https://docs.google.com/forms/d/e/1FAIpQLSdKp4MGk9wQNyphZw2-blAK0_m3A2tpAP5bi-i2KFrEkXPiwQ/viewform?usp=sharing.

The second section analysed the residents' and visitors' perceptions towards the Heliopolis district before and after the urban transformation based on the principles of the city identity and place-making indicators and modes of mobility.

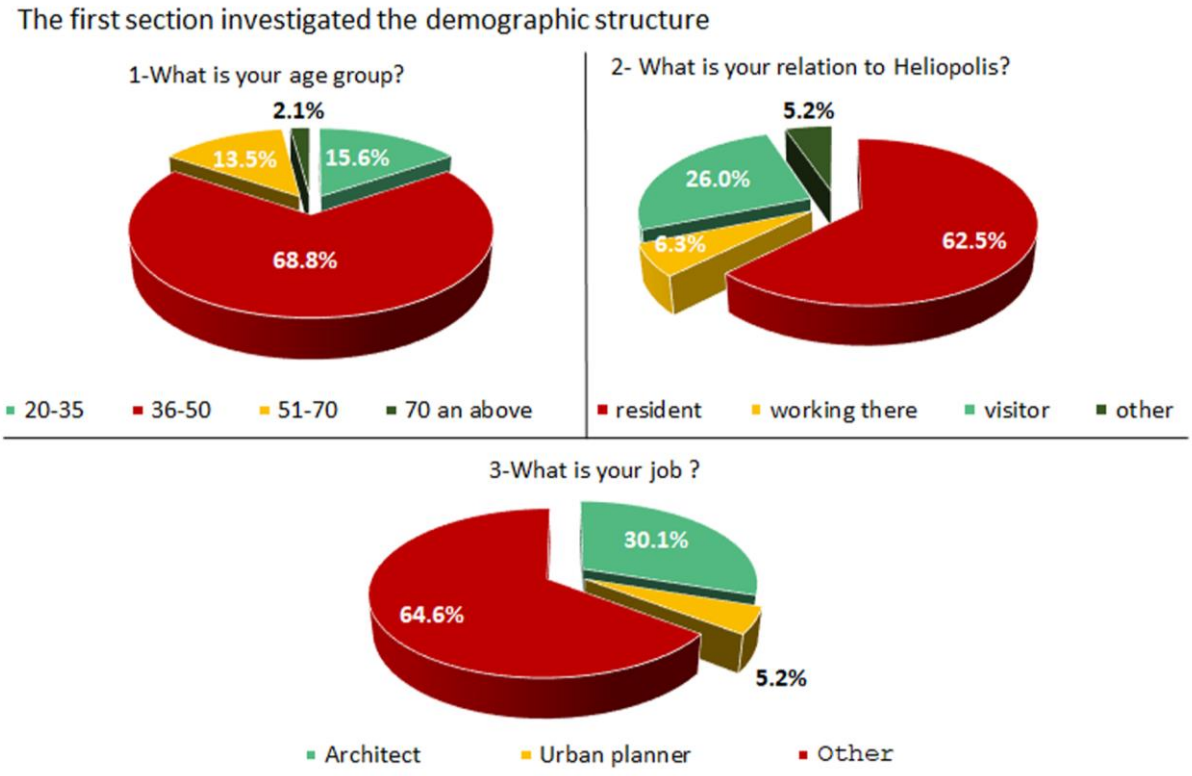
- What is your opinion towards the physical changes in Heliopolis urban form?
- After the flyover constructions and street expansions, what are the social, environmental, and physical impacts of these flyovers on the urban context of Heliopolis?
- How have the flyovers and street expansions affected your daily mobility patterns within Heliopolis?

The third section of the survey was designed to gather residents' and visitors' opinions and satisfaction levels regarding the activities implemented under the flyovers.

- What are your opinions regarding the activities implemented under the flyovers?
- Do you believe these activities affect the identity of Heliopolis?
- What is your suggestion for the land use under flyovers?

4. Results

The survey primarily consisted of residents, providing a focused analysis of the local community's satisfaction. Figure 6 shows the survey results. A significant portion of respondents (35.4%) were engineers or urban planners, lending credibility to the findings. All respondents had witnessed the Heliopolis neighbourhood before urban development, indicating first-hand experience. The survey included 96 individuals: 63% residents, 26% visitors, and 6% workers. Most respondents were aged 36–50 (68.8% responses), followed by 20–35 years old (15.6 responses), 51–70 years old (13.5 responses), and only two respondents over 70. This demographic distribution ensures a comprehensive understanding of various perspectives within the Heliopolis community. Figure 6 shows the results of the demographic structure of the sample size.



Source: the authors

Figure 6. Results of the first section of the survey

In the second section (Figure 7), the physical impacts were evident after the flyover constructions and street expansions. 86.5% of respondents noted a profound effect on the urban form, indicating that the development projects significantly transformed Heliopolis's physical appearance and spatial characteristics.

Conversely, 13.5% of respondents viewed the transformation as superficial, perceiving the changes as minor or cosmetic, without significantly altering the neighbourhood's overall appearance or functionality. Additionally, many respondents highlighted various impacts on the urban context: 38.5% mentioned that building facades had changed and are now covered with grey structures, and 26% stated that buildings facing flyovers experienced lower property values as potential buyers or renters might view the lack of privacy and the view as significant drawbacks.

Social Impacts: A percent of 62.5% of the respondents said they felt unsafe crossing the city's vast, unsafe streets that act as barriers, discouraging movement between different parts of the neighbourhood, thus reducing opportunities for social interaction and community bonding. Privacy was also mentioned by 43.8% of the respondents for the buildings facing the flyovers, which led to discomfort and a reduced sense of personal space within their homes.

Environmental Impacts: 65.6% of the respondents valued the disappearance of green spaces. Noise and pollution responses came to 30.2%. Constant exposure to noise and pollution contributed to increased stress and anxiety levels, negatively affecting the overall mental well-being of residents.

Visual Elements: After the construction of flyovers, about 62.5% of the respondents stated that the visual image of Heliopolis was affected by the construction of flyovers. She indicated a widespread perception of the neighbourhood's aesthetic change due to the urban development. Mobility patterns, after the urban transformation, pedestrian accessibility: approximately 63.1% of the respondents reported finding it hard to travel from one place to another within the neighbourhood on foot.

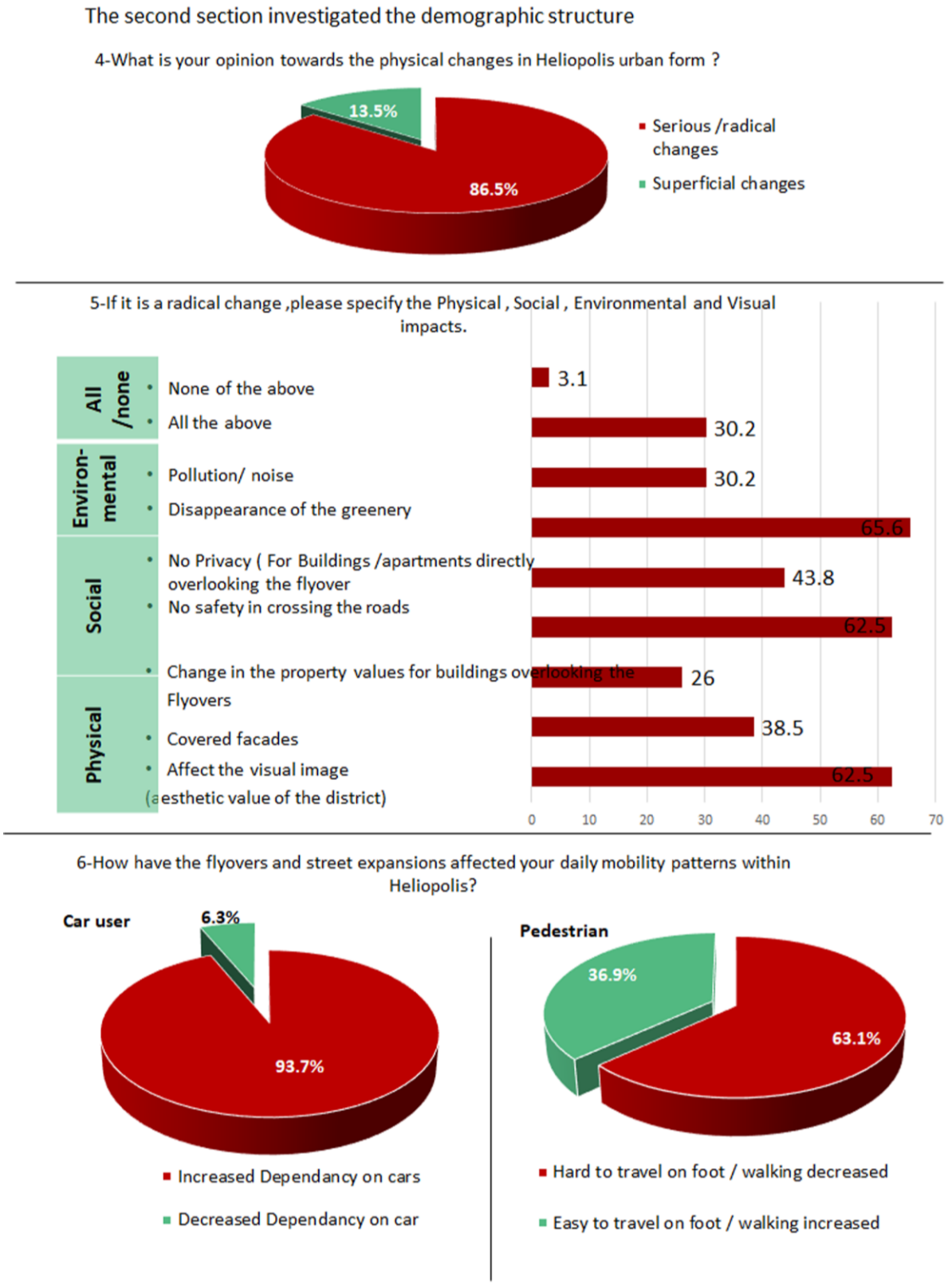
Conversely, 36.9% of the respondents reported finding it easy to travel on foot within the neighbourhood. Vehicle accessibility, a general increase in car use in short and long distances, and about 93.7% of the respondents reported an increase in dependency on cars as their primary mode of mobility. This suggests a notable trend towards greater reliance on private vehicles for transportation.

In Figure 8, the third section focused on the activities added under flyovers. About 41.5% of respondents supported these activities but stressed the need for designs compatible with Heliopolis's distinctive architectural elements, indicating a preference for seamless integration with the existing environment. A slightly higher percentage, 41.7%, opposed any activities under the flyovers due to noise pollution concerns, highlighting the importance of minimizing adverse environmental impacts.

A smaller group, 17%, supported these activities without reservations. Additionally, 69.1% of respondents felt that the activities under the flyovers significantly affected Heliopolis' identity, preferring open gardens over large grey structures with stores and cafeterias. About 28.7% found the impact on Heliopolis' identity acceptable, while a small minority, 2.2%, believed these activities did not affect the neighbourhood's identity.

The areas under flyovers reflect their preferences and perceived needs. The most popular choice was landscape and open gardens, which 43% of respondents selected, indicating a desire for more green spaces and recreational areas. Parking areas were the second most suggested option, chosen by 36%, highlighting a significant demand for improved parking facilities.

Sitting areas and cafeterias were indicated by 13% of respondents, showing interest in social and leisure activities. Only 5% of respondents preferred stores and shops, indicating limited interest in commercial activities under flyovers. Few respondents suggested cultural activities, entertainment, and children's activities, indicating these are lower priorities than other options.



Source: the authors

Figure 7. Results of the second section of the survey

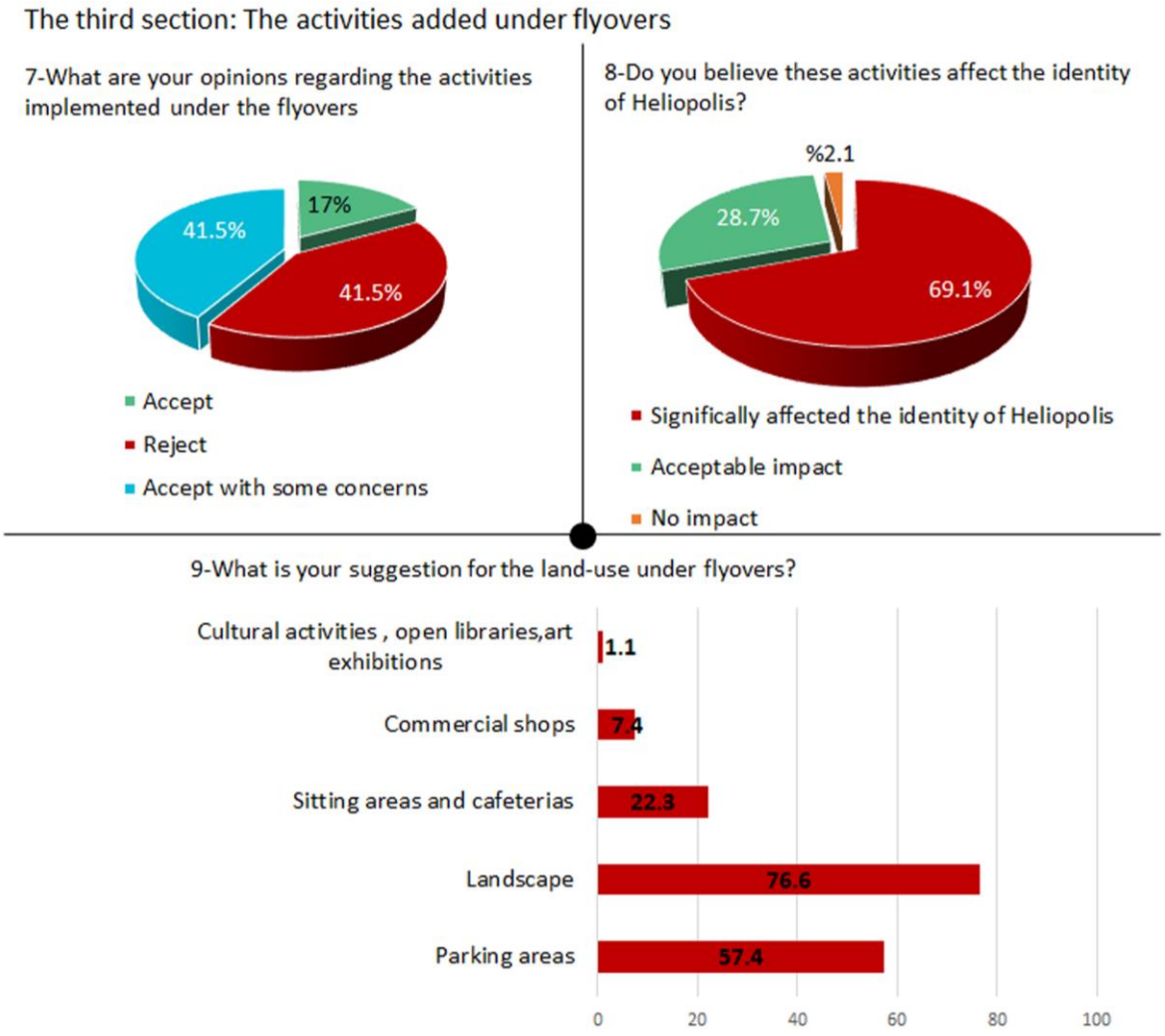


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Figure 8. Results of the third section of the survey

5. Discussion

This study was designed to investigate the changes that occurred in Heliopolis based on data reflecting a range of concerns among residents regarding the transformation of Heliopolis. These include issues related to pedestrian safety, privacy, the preservation of green spaces and shaded streets, changes in facades, and the impact of infrastructure development on the urban environment. Figure 9 shows the effects of the flyovers on the residents and the urban environment.

Understanding these perceptions can inform future urban planning efforts to address residents' needs and preferences effectively. Furthermore, road widening has led to a significant increase in traffic flow and driving speeds throughout the neighbourhood, which is associated with increased noise and air pollution, substantial reductions in walkability, and increased traffic-related injuries. This result indicates a considerable issue with pedestrian accessibility within the neighbourhood.

This difficulty is related to two different issues. The width of streets increases the distance that pedestrians must go to cross them, making it less convenient for pedestrians. Speeding cars makes it difficult for people to cross safely. This could be attributed to a lack of infrastructure, such as pedestrian crossings, bridges, or speed limit signs. This general trend indicates a transition to less environmentally friendly modes of transportation. The considerable increase in car use may result in various issues, including traffic congestion, pollution, and decreasing physical activity levels. Data from our survey also indicates a variety of perspectives on the activities added under the flyovers. A significant worry is their impact on neighbourhood character, with a preference for green spaces and parking over commercial activity.

The high proportion of respondents suggesting parking areas and landscape/gardens indicates that these areas might be lacking or inadequate in the current state and in poor condition or insufficient to meet the needs of residents effectively. Based on these responses, policymakers and urban planners can develop strategies and policies that address Heliopolis's physical, social, environmental, and

visual impacts of urban development projects.

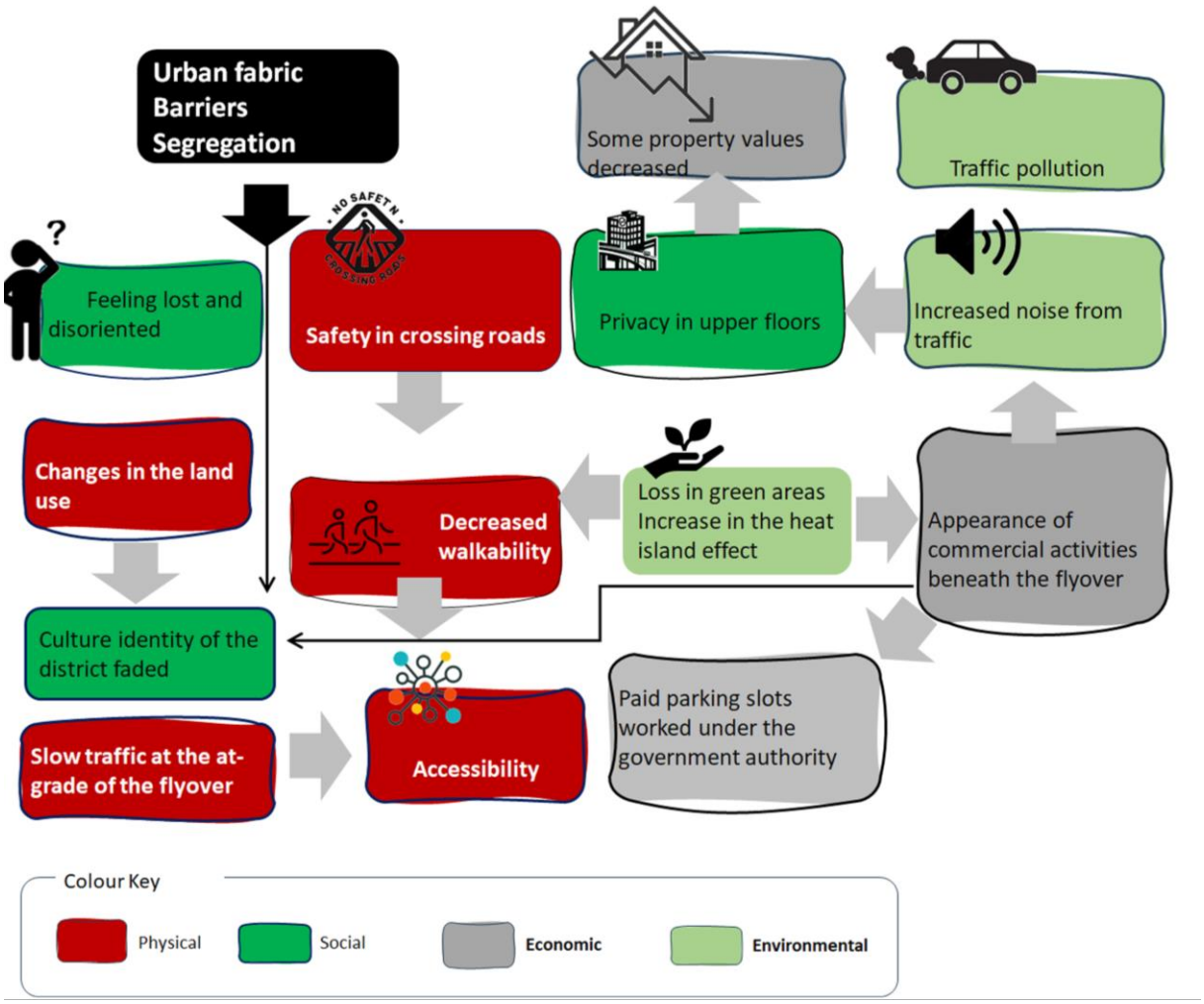
Regarding the physical dimension, our study indicates, according to our respondents, that it is essential to enhance the urban context and mobility through the following suggested actions. Detailed assessments of urban form changes are crucial to ensure that development projects enhance aesthetics and functionality.

Promoting mixed-use developments integrating residential, commercial, and recreational spaces can reduce the need for long-distance travel and ensure that new developments are seamlessly integrated with the existing urban fabric. Encouraging residents to reduce car use and opt for more sustainable modes of transport is essential for improving urban living.

Implementing speed limits in residential areas and speed bumps, raised crosswalks, and curb extensions can naturally slow traffic and make communities more pedestrian-friendly. Subsidies for bicycle purchases, walking programs, and community activities can help promote sustainable transportation. These incentives have already been deployed at metro stations such as Heliopolis Square and El Korba.

Creating seamless connections between public transportation and pedestrian/bicycle networks is vital for promoting alternative modes of transport. Constructing multi-level parking structures and implementing intelligent parking solutions can optimize space usage and ease of access, contributing to a more efficient and sustainable urban environment.

Several measures are recommended to enhance urban mobility and context. Increasing the number of pedestrian crossings, especially on wide streets, is crucial. These crossings should be well-marked and equipped with traffic-calming measures such as speed bumps and signals.



Source: the authors

Figure 9. The impacts of the flyovers on the residents and the urban environment

Additional safety measures like raised crosswalks, pedestrian islands, and narrower traffic lanes can help slow down vehicle speeds, making streets safer for pedestrians. Expanding and maintaining sidewalks to ensure they are wide, unobstructed, and accessible for people with disabilities is essential. Trees should be planted to create more inviting pedestrian environments, and benches should be installed along walkways. Moreover, constructing pedestrian bridges can facilitate safe crossing in areas where street-level crossings are not feasible or safe.

The responses in our survey also indicated results related to the **social dimension** of the site. Developing small public spaces or "nodes" at crucial intersections and within residential areas is essential. These spaces can include parks, playgrounds, and community centres where residents can gather and interact, enhancing the visual appeal and usability of the area. Organizing regular community events, such as cultural festivals, can encourage residents to use public spaces and engage with one another, as the Heliopolis initiative group already initiated.

To improve the **environment,** trees, shrubs, and vertical gardens should be planted along the sides of flyovers to create natural screens that block direct views into residential buildings. Furthermore, architectural elements such as louvres, frosted glass, or patterned panels can be installed on the exterior of buildings to enhance privacy without blocking natural light. Planting more evergreen trees and maintaining existing green spaces are essential to improving air quality and providing shade. Ensuring their accessibility and regular maintenance is equally important.

Developing parks and green corridors can provide residents pleasant and safe walking routes. It's crucial to ensure that green spaces are interconnected and accessible from all parts of the neighbourhood, promoting a cohesive and green urban environment.

Small parks with seating areas, walking paths, and playgrounds should be developed to promote recreational activities. Cultural events, community markets, and art installations can be organized in designated under-flyover spaces to utilize otherwise neglected areas effectively. Additionally, projects that preserve and highlight nostalgic elements, such as the Dolphin Show and historic buildings, can strengthen emotional ties among residents.

Adopting sustainable building practices in urban developments is crucial for minimizing environmental impact. Furthermore, incorporating green infrastructure projects, such as green roofs and walls, improves ecological quality and enhances the appearance of buildings facing flyovers.

In the **visual dimensions,** our results also revealed that double or triple-glazed windows and soundproofing materials should be used in walls facing the flyover to reduce noise intrusion. Additionally, installing noise barriers and sound-absorbing materials in high-traffic areas can mitigate noise pollution.

Enforcing restrictions on loud activities and regulating the operating hours of commercial entities are also necessary measures to ensure a quieter and more liveable environment. It is essential to establish design guidelines that emphasize the unique characteristics of Heliopolis, such as its road system and green spaces. Implementing aesthetically pleasing designs for the flyover, such as attractive cladding or public art installations, can reduce the visual impact on nearby buildings. Additionally, transforming under-flyover spaces into landscaped gardens with native plants can enhance the area's aesthetic appeal and environmental sustainability.

Designate specific areas, such as Maryland, Basilique Korba, and Baron Palace, as historic preservation zones with guidelines to maintain their architectural integrity. Collaborate with architects specializing in historical and cultural preservation to ensure that new designs under flyovers complement the existing architecture of Heliopolis.

Support community engagement and cultural activities in suitable locations to foster a sense of place attachment.

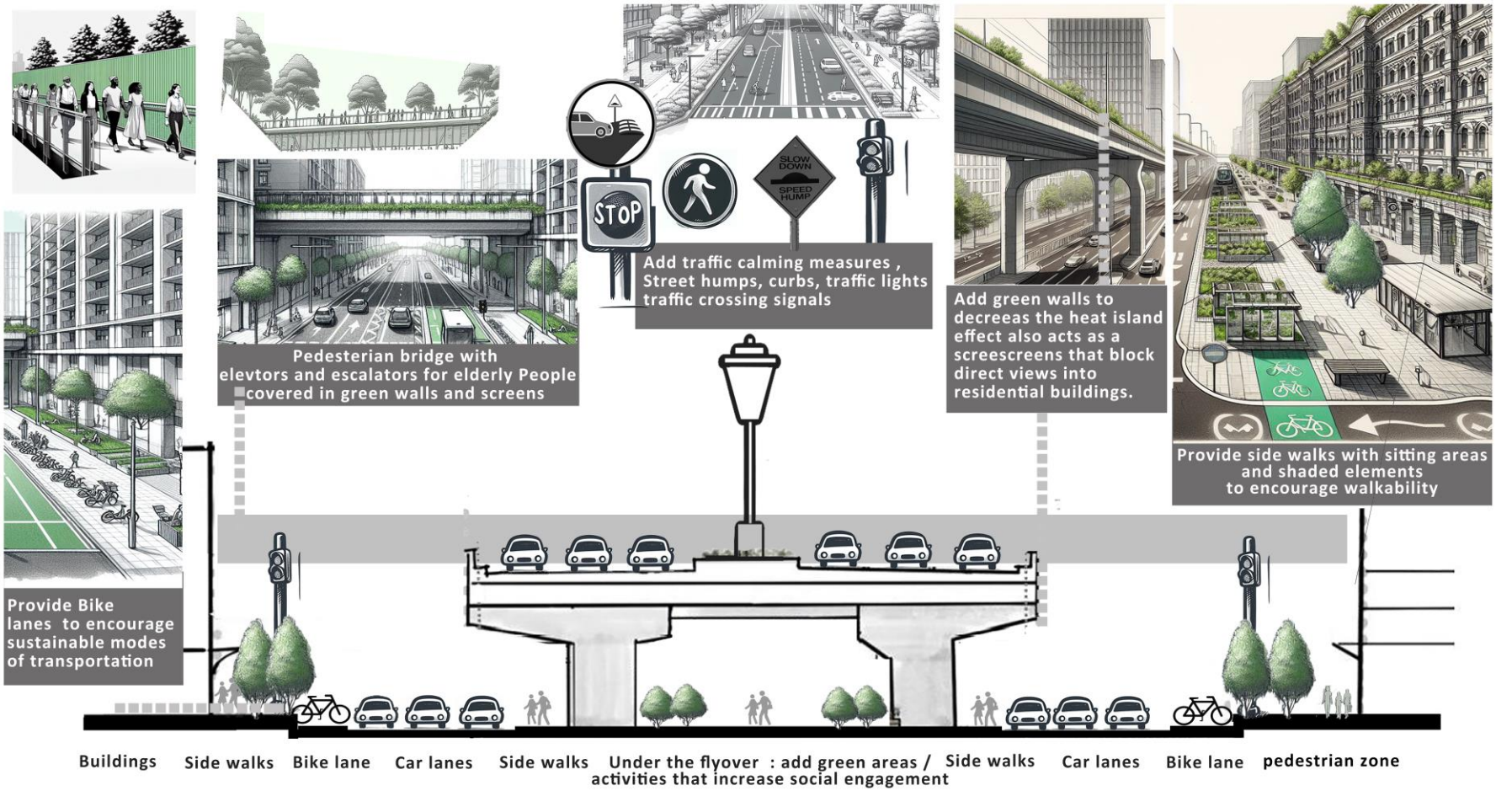
Establish design guidelines that emphasize the unique characteristics of Heliopolis, such as its road system and green spaces. Implement aesthetically pleasing designs for the flyover, such as attractive cladding or public art installations, to reduce the visual impact on nearby buildings.

Under-flyover spaces can be transformed into landscaped gardens with native plants to enhance the area's aesthetic appeal and environmental sustainability. Figure 10 shows a section in the street showing the necessary elements the roads might have after the flyover construction.

To ensure effective implementation and monitoring of urban policies in Heliopolis, it is crucial to integrate the outlined strategies into a comprehensive policy framework that aligns with the city's broader urban development plan. This framework is a roadmap for coordinating various initiatives with the community's long-term goals, promoting coherence and consistency in policy decisions.

A robust system for continuous evaluation and feedback is essential for assessing the impact of urban development initiatives. Regular monitoring provides policymakers with insights from residents, allowing them to make informed adjustments and address emerging challenges effectively.

Public engagement is also crucial. Creating accessible channels for residents to voice concerns and offer suggestions on mobility and accessibility issues fosters a sense of ownership and collaboration in urban development. Coordination with community organizations ensures that urban policies reflect the diverse needs and preferences of Heliopolis' residents. By actively involving stakeholders in decision-making, policymakers can leverage local knowledge and experiences, enhancing the relevance and effectiveness of enacted policies.



Source: authors

Figure 10. A section in the street shows the necessary elements that the roads might have after the flyover

A dedicated committee comprising residents, urban planners, architects, and municipal representatives is recommended to oversee planned changes. This committee would ensure accountability and transparency throughout the process while promoting collaboration among stakeholders. By adhering to these urban policy implementation and monitoring principles, policymakers and planners can honour Heliopolis' heritage while advancing toward a more sustainable, inclusive, and pedestrian-friendly urban environment.

This approach reduces dependence on private automobiles while enhancing connectivity, accessibility, and the vibrancy of social and economic activities within the community. The research limitations include the study's concentration on a specific district, which may not accurately reflect broader urban patterns. The practical consequence is that urban planners should consist of community feedback to promote sustainable and inclusive development. The social ramifications highlight the significance of maintaining cultural heritage while meeting modern infrastructure needs. Besides, the research limitations do not cover the historical dimension in depth.

6. Conclusions

The transformations in Heliopolis, notably the construction of flyover projects aimed at alleviating traffic congestion, have brought about significant changes, altered the landscape of specific areas and potentially disrupted the sense of place. This investigation delves into the effects of these initiatives on residents' attachment to the neighbourhood and their modes of mobility. The impact of these projects extends across various dimensions of Heliopolis' identity, encompassing physical, social, and environmental aspects, presenting a nuanced and multifaceted picture with both adverse and potential positive outcomes.

The findings highlight respondents' profound familiarity with Heliopolis's pre-development state, emphasizing the pivotal role of community engagement and stakeholder participation in shaping urban development initiatives. This underscores the imperative for inclusive decision-making processes that involve residents in the planning and execution of projects, ensuring that their voices are heard and their concerns are addressed. Moreover, the results underscore the significance of integrating sustainable mobility principles into urban planning and development endeavours. By prioritizing sustainable transportation solutions and fostering walkability and accessibility, policymakers can mitigate infrastructure projects' negative impacts while promoting Heliopolis's more environmentally friendly and socially inclusive urban environment.

Reflecting on the hypothesis, it becomes evident that the introduction of flyovers in Heliopolis represents a critical juncture in the district's evolution. The anticipated changes highlight a tension between the need for modern infrastructure to enhance transportation efficiency and the imperative to preserve the unique visual and cultural identity that characterizes the community. As urban planners and policymakers navigate this complex landscape, understanding the varied perspectives of residents, commuters, and urban planners is essential.

The findings suggest that while modern developments can facilitate improved mobility and economic growth, they also pose risks to the safety and attachment of the community to its cultural heritage. Therefore, fostering an inclusive dialogue that allows for the integration of community feedback can be vital in crafting urban policies that harmonize development with cultural preservation.

Ultimately, the successful implementation of urban strategies in Heliopolis will depend on balancing these competing interests to ensure that the district evolves in a way that honours its historical legacy while accommodating the demands of contemporary urban living.

Future research could expand beyond Heliopolis by conducting comparative studies across various districts in Egypt or other countries facing similar urban transformations to identify broader urban patterns and common challenges in balancing infrastructure development with cultural preservation. Longitudinal studies that track changes in community attachment, safety perceptions, and visual identity over time could provide deeper insights into the long-term impacts of urban development, assessing how perceptions evolve as new infrastructure integrates into the urban fabric.

Additionally, exploring innovative methodologies for engaging community members in the urban planning process, such as participatory design workshops or digital feedback platforms, would help incorporate community voices for more inclusive and sustainable urban policies. Investigating the role of cultural heritage in shaping urban policy decisions could provide valuable insights by analysing case studies where cultural considerations have been successfully integrated into urban development plans.

Cross-disciplinary approaches incorporating perspectives from urban planning, sociology, cultural studies, and environmental psychology could enhance the understanding of how urban transformations affect social dynamics, community identity, and overall quality of life.

Conducting quantitative assessments to measure the socio-economic impacts of urban developments on different demographics within the community would yield valuable data for tailoring interventions. Finally, evaluating the effectiveness of specific urban policies implemented in response to community feedback can inform best practices for urban planners, fostering the development of urban environments that promote cultural heritage while accommodating contemporary needs.

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