REVITALIZING THE BORDERLINES THROUGH ARCHITECTURE OF GREEN NETWORKING - CASE STUDY: BEIRUT, LEBANON

Karim Al-Khatib
Master Student, Faculty of Architecture - Design & Built Environment, Beirut Arab University, Lebanon,
kma000@student.bau.edu.lb

Maged Youssef
Associate Professor, Faculty of Architecture - Design and Built Environment, Beirut Arab University, Lebanon, m.nabilyoussef@bau.edu.lb

Mona M. Salem
Assistant Professor, Faculty of Architecture - Design & Built Environment, Beirut Arab University, Lebanon, m.abdelkadersalem@bau.edu.lb

REVITALIZING THE BORDERLINES THROUGH ARCHITECTURE OF GREEN NETWORKING - CASE STUDY: BEIRUT, LEBANON

Abstract

Borders are an essential part of cities and countries, and they can create both physical and cultural divides. Inner-city borders can lead to social isolation and inequality, which can contribute to tensions and conflicts. Borders around the world have become a symbol of conflict, racism, fear, inequity, and division. One single line could divide between opportunity and hope and poverty and oblivion. Accordingly, some borders create social isolation between various cultures in cities that increase socio-political problems and remove urban connectivity. Green networking involves using urban green spaces, such as parks and gardens, to connect different areas of a city and facilitate movement and interaction between people. This research aims to examine the impact of inner-city borders on social integration between different cultural groups by using green networking to break down barriers and promote social interaction. The study will contribute to a better understanding of how urban green spaces can promote social integration and reduce inequality in inner cities. The study will use scientific methodology, including site visits, experimental examinations, and analytical research, to provide a comprehensive understanding of the borderline area of research.

Keywords

Borderline, Green Networking, Reviving, Culture, Social Integration, Public Area.

1. Introduction

Borders have been historically seen as zones of separation and exclusion, but recent perspectives suggest that they should be considered as zones of touch and interaction (Anzaldua, 1987). The dialectical understanding of borders as zones of contact considers them as both cultural and economic environments in addition to a political arrangement (Hirschfield et al., 2014). The purpose of creating a border is to differentiate and denote the polar opposite of order, which is disorder. According to Comaroff (2007), violence and lawfulness create one another, and disorder and order are mutually constitutive. Hence, the construction of a border is a key aspect of creating social order (Sibley, 1995). The study of borders enables us to understand how divisions are genuinely conducted, the techniques utilized by group members in establishing symbolic divides between in-group and out-group, and how they assign meaning (Zerubavel, 1981; Gazit, 2010). Furthermore, urban borders are not just physical barriers but also play a crucial role in defining the lifestyle and quality of life in a community. Social segregation and the militarization of the criminal world are also linked to how urban space is split up by different borders, which creates distinct hotspots of criminal activity (Wacquant, 2008; Albright et al., 2013; Ilan, 2011). This leads to a new set of research issues that relate neighborhood violence to racial spatial division, and how we can break down these barriers to create more integrated and sustainable cities.

This research aims to examine the impact of inner-city borders on social integration between different cultural groups by using green networking as a way to break down barriers and promote social interaction. The study recognizes the impacts of green networks in achieving sustainability on socio-political levels, enhancing the quality of life in the city and neglecting the development of bad social behavior. The research methodology includes site visits, experimental examinations, and analytical research to investigate the socio-economic-environmental impact of urban generation on the lifestyle of the community, using a case study.

The paper is structured as follows: The first section provides a theoretical background and explains the importance of studying the border mechanism. The second section presents the research objectives, research questions, and methodology. The third section provides a case study analysis and discusses the results. Finally, the conclusion summarizes the findings and offers recommendations for policymakers and urban planners.

Fig.1: Different a border can make in Africa
Source: Miller (2017)

Fig.2: The separation barrier in Shoafat, Jerusalem.
Source: Fitoussi (2018)

2. Literature review

The concept of the central area and periphery relationship has been extensively discussed in the literature of urban studies. The central area represents the heart of the city, where the majority of the city's economic, political, and cultural activities occur. The periphery, on the other hand, is the outermost part of the city that is often neglected and underdeveloped. This relationship is multifaceted and involves various factors such as geography, geopolitics, economics, and socio-cultural aspects. The central area is generally associated with achievement and success, as it is

where the elite of society reside and work. The central area is where ideas and inventions are developed, and political and economic power is accumulated and disseminated. The central area is often viewed as a symbol of wealth and success, where people aspire to live and work. However, the brilliance of the central area hardly reaches the "borderlines," the areas that lie on the outskirts of the city. These areas are often marginalized and deprived of basic services and facilities. They lack recreational areas, green spaces, cultural amenities, and public spaces. As a result, people living in these areas often face social isolation and inequality, which can contribute to tensions and conflicts. Therefore, it is essential to explore ways to revitalize the borderlines and promote social integration between different cultural groups.

2.1. Definition of borderline:

There are several cousin words to "border" that are connected. The words "border," "frontier,"margin," "edge," "periphery," and "and margin" are among them. (Parker 2008) These two terms are equivalent. Or, there may be an attempt to create distinct definitions, giving each its own room and nuance. There is no need to aim for comprehensive, cognitively complete categorization; both approaches have merit. There have been, are, and will continue to be several definitions and methods for defining "the border." (Donnan and Wilson 1999)

Fig.3: Belgian-Dutch border
Source: Kljajić (2021)

The phenomenon of borderline is distinguished from a different perspectives and levels: Geographically (the physical difference between the urban and surrounding agrarian landscape), architecturally (historically usually, institutions of political authority and representative public places clustered in the very center of the city vs outlying residential or industrial zones), politically (the historic core or historic quarters versus the modern districts), economically, and socially (borderlines of living spaces of different ethnic, social or religious groups). These disciplines interpret the concept of social exclusion differently and do not combine ideas of the border into a single, all-encompassing term (Donnan & Wilson 1999).

Borders are crucial. They function as boundaries of inclusion and exclusion. Maybe we can mend them. But they could alter. (Mazower 2000) Such transformation might be either physical or mental. Furthermore, issues may be caused by fixedness or changed, or they may be resolved by change. All of this is true regardless of the kind of border—physical, political, personal, etc. Whatever their nature, borders may distinguish between health and sickness, as well as between strength and weakness.

2.2.Green network:

Many different types of urban greenspace, such as house gardens and open spaces next to roads and train tracks, are referred to as greenspace, sometimes known as green infrastructures or green systems. Urban greening, commonly referred to as "green infrastructure," has garnered a lot of interest as a strategy to encourage people to engage with their local natural surroundings by enhancing community access, leisure activities, and environmental and ecological quality outside and inside of communities. (Pauleit, 2007)

Fig.4: Hamburg greenery
Source: Konstantin (2022)

Green networks, corridors, and links are thought to be

one of the most effective ways to reverse the effects of fragmentation on biodiversity. They also provide a variety of additional social and environmental benefits, such as an improvement in the surrounding landscape's character and more options for public access and recreational use. Techniques to reduce habitat fragmentation have been developed using landscape ecology principles, which include the metapopulation theory, landscape measurements, and modeling of target species. Planning and managing peri-urban and metropolitan regions using these approaches is becoming more popular. The difficulty is in merging these ideas with other, more known theories on the importance of green spaces in cities. (Moseley 2008)

The case for urban greenspace's many economic, social, and cultural advantages is now well-supported by a large body of research. Urban greenspace is regarded to be a way to support urban redevelopment and raise the economic grade of social housing. Economists have quantified these benefits in particular regions by connecting the extension of green greenspace or the installation of trees to improvements in real estate values and people's willingness to pay more for or migrate to greener areas. These methods include contingent valuation and hedonic pricing. Although decision-makers give a lot of weight to such information, locals often view the intangible benefits of greenspace as being more significant in their lives.

Many connections between land use and people's quality of life are found in a study commissioned by Scottish Natural Heritage, including advantages like community cohesiveness, empowerment, and development. Urban greenspaces may foster social networks and boost people's feelings of community, coherence, and belonging by offering a common area for social interaction. These advantages may be strengthened via active involvement in initiatives designed to improve the standard or usefulness of greenspace. (Lawton 2010)

The goal is to embrace green networks as a planning method and to increase the amount and connectivity of greenspace within the urban environment. Adopting a green networks approach to regionally focus the supply of greenspace and increase connectivity is a more effective solution than simply increasing the amount of greenspace.

The identification and preservation of greenspace is prioritized so that People may get away from the city, get some exercise, improve their health and well-being, and learn about and raise awareness about environmental issues. Through these activities, residents will grow to appreciate and identify with the green greenspace in their community. Urban areas' environmental quality may change as a result, increasing the region's economic worth and boosting investment and other forms of economic activity.

Environmental, social, economic, and cultural factors are being taken into consideration by land-use planning systems all around the globe. Greenspace is widely acknowledged to play a part in both formal and naturalistic (biodiversity-friendly) landscape design in cities. This planning advice emphasizes the value of green greenspace in fostering community engagement, sustainable planning, and social improvement.

2.3. Principles of green infrastructure

The "green infrastructure" ecological framework is constructed around two key activities. The first includes establishing a network of interconnected green areas for the benefit of the community. Green infrastructure provides recreational opportunities, beautiful characteristics, and enhanced health. The second is the link between protecting intrinsic species, improving ecological processes, and preserving natural habitat. Green infrastructure promotes a landscape-based strategy that stresses ecosystem protection and enhanced public health. Despite the fact that "biological, social, economic, environmental, cultural, and political challenges" constitute a significant percentage of public health. This green strategy integrates the attributes of effective settings through its six guiding principles: Connectivity, Habitability, Multifunction, Identity, Resilience, and Return on Investments. (Rouse et al., 2013).

2.3.1. Connectivity

A well-connected network of green sites is necessary for green infrastructure to function properly, as opposed to isolated green areas. For instance, parks and squares in urban developments that are connected by paths could attract a wider range of people than a park that is isolated in a residential area. There were 1600 residential units in the High Point redevelopment project in Seattle, representing diverse socioeconomic classes. It created a system of swales, ponds, and parks that served as water storage areas and public recreation areas. 4500 linear meters of landscaped area were used to create Seattle's longest natural drainage system. A safe environment for pedestrians, integrated natural drainage systems, and improved water quality were all provided by the street grid design. The project improved the visual appeal and sense of place in a congested urban region. (Johnson & Staeheli, 2016).

2.3.2. Habitability

Second, green infrastructure increases the livability of the built environment. It develops aesthetically stunning habitats that encourage both mental quietness and physical exercise by offering outdoor leisure spaces, filtering air and water, and producing aesthetically pleasing situations that promote both mental calmness and physical activity. Green spaces increase walkability by providing shade and minimizing traffic, whilst groomed roadways create locations for community gatherings, social contact, and connection. Green infrastructure protects natural features while also providing habitat for plants and animals. SW Montgomery Green Street in Portland is part of the city's green infrastructure. It shows the street as a gentler section of town. The "green street" connects the Willamette River and the West Hills. It is well-known for its unique ways. In addition to regulating drainage and increasing air quality, the street offers dynamic, bustling social venues in an ultra-urban context, provides several transit alternatives, and prioritizes pedestrian and bicycle traffic. (Li, 2018).

2.3.3. Multi-functionality

Third, green infrastructure offers benefits for the environment, the economy, and the community, which form the basis of the "triple bottom line" concept. By using this strategy, green infrastructure promotes the use of urban parks, waterfront areas, plazas and squares, boulevards, repurposed train tracks, and vacant lots that can be used for a variety of activities.

For example:

i. Urban parks: Parks can provide a variety of leisure activities, including sports fields, amphitheaters, art exhibits, water features, and historic sites.

ii. Waterfronts: Publicly accessible open space can be used for a range of cultural and recreational activities in a mixed-use neighborhood.

iii. Plazas and Squares: As a component of urban developments, they host a variety of events and activities. It's a spot to unwind, eat, have fun, and take in the city. It holds performances and exhibitions.

iv. A landscaped corridor can include highways, pedestrian walkways, and connect prominent green spaces. Boulevards are made of repurposed railroad tracks (Rouse et al, 2013). If properly designed and equipped, it can provide spaces for social interaction and relaxation.

v. Unused areas: An empty location presents an opportunity to include in a network of green infrastructure. It can aid in establishing recreational areas and boosting city beauty. (Firehock, 2015)

2.3.4. Identity

Fourth, green infrastructure encourages the identity of space. It stands for the virtues of the setting and the standard of living it offers. It combines cloth made of natural and synthetic materials that each have a distinct meaning. Given the present focus on employing natural systems as the foundation of infrastructure, green infrastructure is a crucial instrument for improving society and developing beautiful urban environs. Spatial harmony and local identity are tightly interwoven, but many modern metropolitan landscapes may be disorganized and broken. Additionally, spatial link is important for recalling comprehensible and notable locales. The landscape-based method can blend distinct city identities, both modern and traditional, while accentuating the attributes of each within a unified framework. Atlanta serves as an excellent illustration. The city is proud of its valuable urban forest, which enhances its appearance. The city preserves and enhances its natural surroundings through strict laws. The limits guarantee no net loss of trees and optimal protection of green places. (Rouse et Bunster, 2013).

2.3.5. Resiliency

Fifth, green infrastructure (GI) enhances resiliency across communities. Designing a green infrastructure plan increases the resilience of urban projects on the basis that people, and nature are interdependent. It decreases CO2 levels, regulates storm water volume and rate, lessens warming, creates a buffer zone to defend against rising sea levels, and establishes routes for species. Green infrastructure increases robustness by promoting healthy biodiversity. Increasing urbanization now isolates biological areas and hastens their destruction, yet GI serves as a bridge for such regions. (Alberti & Marzluff, 2004)

For example:

Trees produce a microclimate, provide shade, and reduce the heat island effect. Reduce the requirement for cooling systems in buildings utilizing green roofs. Natural drainage systems, such as rain gardens, permeable tiles, and wetlands, lower the expenses involved with grey infrastructure while boosting its capacity. (Rouse et Bunster, 2013).

Seattle's green infrastructure serves as an illustration of this. In order to reduce the amount of runoff water that pollutes its waterbodies and threatens marine life, Seattle, one of the most environmentally friendly cities in the US, is building green storm infrastructure. In order to decrease danger to people, property, and the environment, Seattle strives to use as much green storm water infrastructure (GSI) as is practical. The city created a well-designed regulatory framework, such as the stormwater code and the green factor, in addition to various financial incentives, to broadly implement the green plan. The strategy is built on public-private collaboration to develop a more resilient city.

2.3.6. Return on investments

Last but not least, despite the fact that green infrastructure seems like a promising tool for improving community livability, taking the economic aspect into account is essential for a successful implementation. Green infrastructure offers Many financial advantages to both the public and private sectors. Rising real estate costs, falling costs for grey infrastructure, or a decrease in the usage of resource-intensive cars could all contribute to this. In Pennsylvania, a protected green space increased the value of all residential properties by 16.3 billion dollars, added about 6900 jobs, and produced 240 million dollars in yearly tax revenue. It also resulted in significant financial savings while enhancing community wellness. The key concepts of green infrastructure are highlighted through three real-world case stories.

2.4. Previous readings:

In "Architecture on the Borderline: Boundary Politics and Built Space," Pieris claims as much. The primary goal of this book, which was published in 2019, was to discuss how nation-state borders are impenetrable to many people while being permeable to others in a volatile world. This book was titled Architecture on the Borderline. It explores how the physical and material circumstances

envisioned, created, or experienced via architecture and urbanization are embodied in these unequal and contradictory social realities. (Pieris, A. Ed. ,2019)

In his work "Cities constructed of boundaries: mapping social life in urban form," Vis claims this. The primary goal of this book, which was published in 2018, was to describe Cities Made of Boundaries, which outlines the concepts and theoretical underpinnings of a fresh Boundary Line Type (BLT) Mapping urban morphological mapping strategy for social science research. It is an appeal to create a paradigm for radically comparative urban studies that is situated between geography and archaeology. A mapping technique employing Geographic Information Systems operationalizes a critical realism view of the limits that construct built space, grounded in transdisciplinary social and spatial theory (GIS). (Vis, B. N., 2018)

The primary goal of this book, according to Benedict and McMahon, was to comprehend the large-scale thinking and coordinated action to plan, preserve, and manage our natural and restored lands. This was stated in their 2012 publication, "Green infrastructure: Linking Landscapes and Communities." Green Infrastructure enables us all to consider the many purposes that the landscape may serve for people and environment, from the small parcel to the multi-state area, and choose the one that makes the most sense. Leading authorities in the subject provide a thorough how-to for planners, designers, landscape architects, and citizen activists in this comprehensive primer. (Benedict & McMahon 2012)

"In order to create a methodology for planning multifunctional green infrastructure that promotes social-ecological sustainability and resilience, the article "Enhancing landscape connectivity through multifunctional green infrastructure corridor modeling and design" integrates landscape ecology and graph theory, spatial modeling, and landscape design. Using structural connectedness at both census tract and citywide scales, the spatial patterns of landscape connectivity throughout the City of Detroit were determined.". (Zhang, Z., 2019)

2.5. First similar example

2.5.1. BQ-Park, New York

Project name: Bq-Park
Location: Brooklyn, New York
Architect: Bjarke Ingels Group (BIG)
Project types: Infrastructure
Project scope: Renovation/Remodel, Addition/Expansion
Size: 538,196 sq. Feet
Year completed: 2019
Consultants: Regional Plan Association, Arcadis

Robert Moses, an avid supporter of building highways, developed the Brooklyn Queens Expressway (BQE) in the 1950s. It has been clogged with cars for more than 60 years and was regarded as an iconic infrastructure. Three decaying cantilevered structures that make up the freeway were built over a period of years. (Cogley 2020) The location drew the attention of the New York administration, which was anxious to transform the area into a better urban setting for residents. BIG Architects saw an opportunity that they could never pass up and put up a comprehensive plan for connecting the SQ Expressway to the SQ Park while still allowing for a considerable amount of vehicular traffic to pass through.

Fig.5: 3D shot of the proposed project BO- Park by Big Architects.
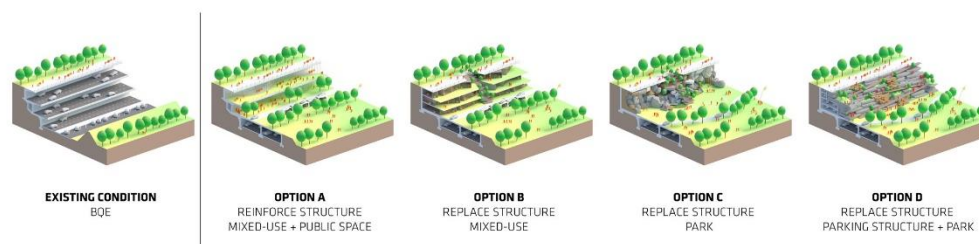Source: Bjarke Ingels Group (2019)

Fig.6: Different sections showing different area
Source: Bjarke Ingels Group (2019)

The idea was to link the park that previously existed and extend it along the shore to create a strong concept that knits together various areas. A park that covers the expressway and provides not just green areas but also a variety of uses and public amenities will be built along the coastline.

One of the greatest examples of an urban greenway is this project. By removing an obsolete freeway that had long since taken up a significant portion of the coastline, the project increases livability and the neighborhood's urban character. By offering public amenities, linking various areas of the city, and stacking the green park atop the infrastructure, BQ Park adheres to the four design principles.

2.5.2. Chouteau Greenway, St Louis, USA

Location: St Louis, USA
Designer: 13 Teams Led by Stoss Landscape Urbanism
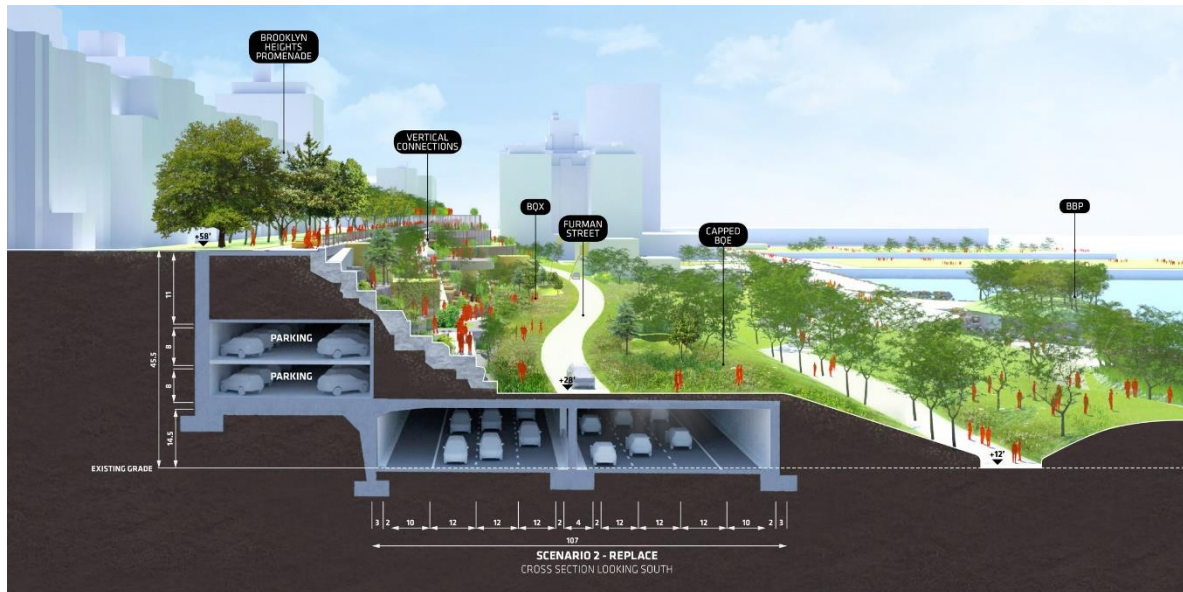Calender: 2018-2019
Client: Great rivers Greenway

Fig.7: Detailed 3D-section showing how the old freeway is replaced with park above the new freeway
Source: Bjarke Ingels Group (2019)

The urban greenway proposal's major goal is to contribute to the urban life, the environment, and the future of St. Louis by offering connection, ecological preservation, economic improvement, and social justice. This case study is titled "The Loop + The stitch." (Stoss Landscape Urbanism 2018). The Chouteau Greenway was envisioned by the design teams as an urban catalyst and enhancer that links communities to natural resources, architecture to parks, people to people, and green spaces to green spaces. The urban greenway also identifies and showcases the city's historical landmarks and untold stories.
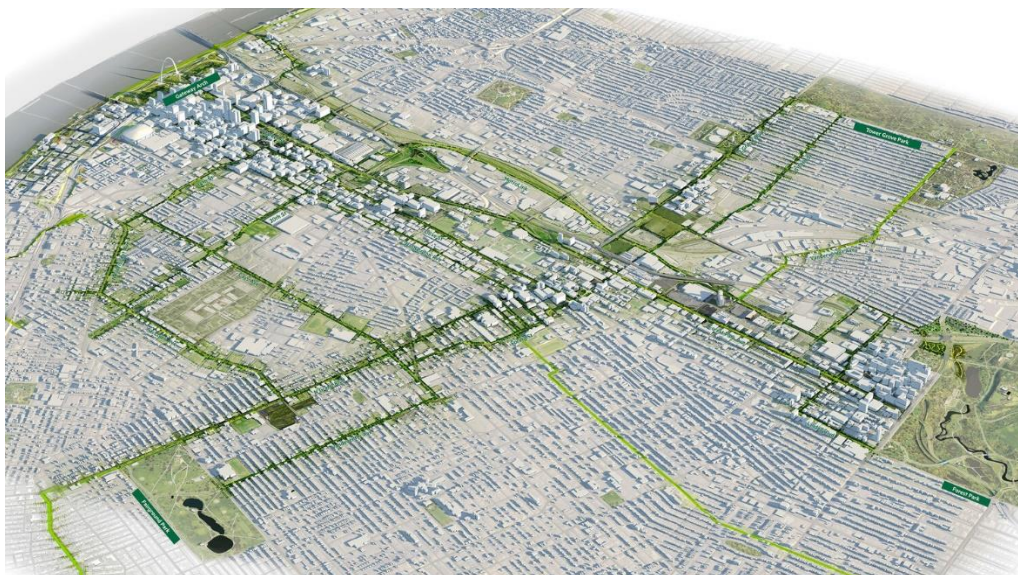

Fig.8: greenway alignment map
Source: belleme (2019)

The designing team had to evaluate the many situations and tales that define St. Louis' unique character to realize their idea; as a result, they identified and recognized the significant landmarks, parks, public amenities, and the city's history. This idea emphasizes the significance of these elements as well as the historical worth that has been lost, elevating various locations via captivating storylines. (Stoss Landscape Urbanism 2018)
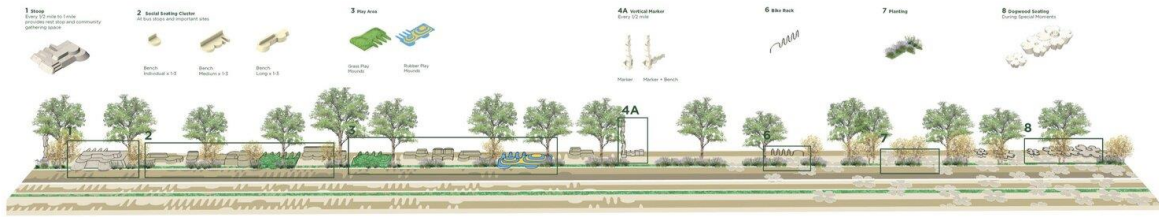
Figure9: design tool kit
Source: Stoss Landscape Urbanism (2021)

The Loop creates a solid link between the city's historical core and its civic landmarks. The local connections and tourist access to all areas of the city are made possible by the stitching. By generating socio-economic and socio-cultural spaces that provide a diversified and rich zone in the city's urban fabric, the urban greenway enriches the open areas around the metropolis. The plan aims to link the Forest Park to the city's waterfront center and to connect northern communities to southern areas.

Fig.10: brickline greenway
Source: Stoss Landscape Urbanism (2021)

Fig.11: brickline greenway
Source: Stoss Landscape Urbanism (2021)

Given that it incorporates the urban community with nature, this concept must be categorized as an urban greenway project. The Chouteau Greenway aims to bring natural elements into the city while also enhancing St. Louis's economic, social, and cultural aspects. In order to enhance the urban quality of life and environment of the city as a whole, it provides a link between the parks and integrates greenery with the city's infrastructure. The Chouteau 9reenway is also intended to be a sustainable greenway that brings nature into the city, emphasizes the value of using rainwater, and prevents further river floods. In order to repair and sew the urban fabric of St. Louis and reclaim the city from the domination of automobiles, the Chouteau urban greenway encompasses all the elements and components of constructing an urban greenway.

2.6. Parameters of Analysis

Based on the previous research, the deduced parameters of the advantages of green networking architecture are summarized in the following table

Table 1: Parameter of Analysis

Parameter	Description
Social cohesion	Social cohesion refers to the sense of belonging and connectedness among the members within the community itself
Vitality	Vitality means the level of liveability and durability of space in urban design
Values	Refer to what people believe is important in the way they perceive things
Breaking barriers	break barriers in order to free public spaces from boundaries
Green networking approach	Showing the different types of green networking

These parameters must be referred to revitalizing the borderline through green networking.

3. Methodology

The paper employs a variety of research methodologies. Three categories are used to organize these. First, information about the chosen case study, "First ring road in Beirut," is gathered using an inductive technique, taking note of the significant changes that have occurred there throughout time. Second, employing field methodology, the author traveled to various locations along the "Beirut Greenline," taking real-time images and conducting interviews with a representative group of residents. In addition to the interviews, a questionnaire was created on an online platform to get their opinions on the challenges facing the Fouad Chehab Bridge and potential solutions. Third, the paper subtracts the results of the questionnaire and the interviews. The research that greens networking revives the borders between terrorizes in the city to tear down the walls between other cultures has finally been done using a logical approach. The four research approaches are presented in the study as follows.

3.1. Introducing the case study of "Fouad Chehab highway, first ring road in Beirut, Lebanon"

Michel Écochard submitted two master plans in 1943 and 1963, after the early independence period's densification of peripheral regions, in an attempt to reduce clogged-up inner-city traffic and lay the groundwork for future suburban expansion. These concepts, albeit not fully realized, helped shape the functionalist worldview of the Modernists, which contends that mobility is solely a functional need. In 1966, the reconstruction period came to an end with the completion of Fouad Chehab Avenue, the expansion of Fakhreddin Street to the west of the BCD, and the approval of "George Haddad" Street to the east of the BCD. As a result, the Eco chard's master plans are now clearly evident in Beirut's urban landscape. After the 15-year civil war in Lebanon ended in the 1990s, the Lebanese government chose to restore the Beirut Central District. Despite suffering major damage during the civil war, the Fouad Chehab Highway was meant to connect the airport, the seaport, and BCD. Its width was expanded, and two overpasses were built over major crossings. Mobility toward the outskirts was therefore strengthened; However, the separation between the Bashoura and Zokak El Blat neighborhoods and the city center was emphasized even more. Additionally, the ring road was built to distinguish the city's core and peri-center, as well as two planning systems, within the post-war reconstruction zone (Haidar 2016)
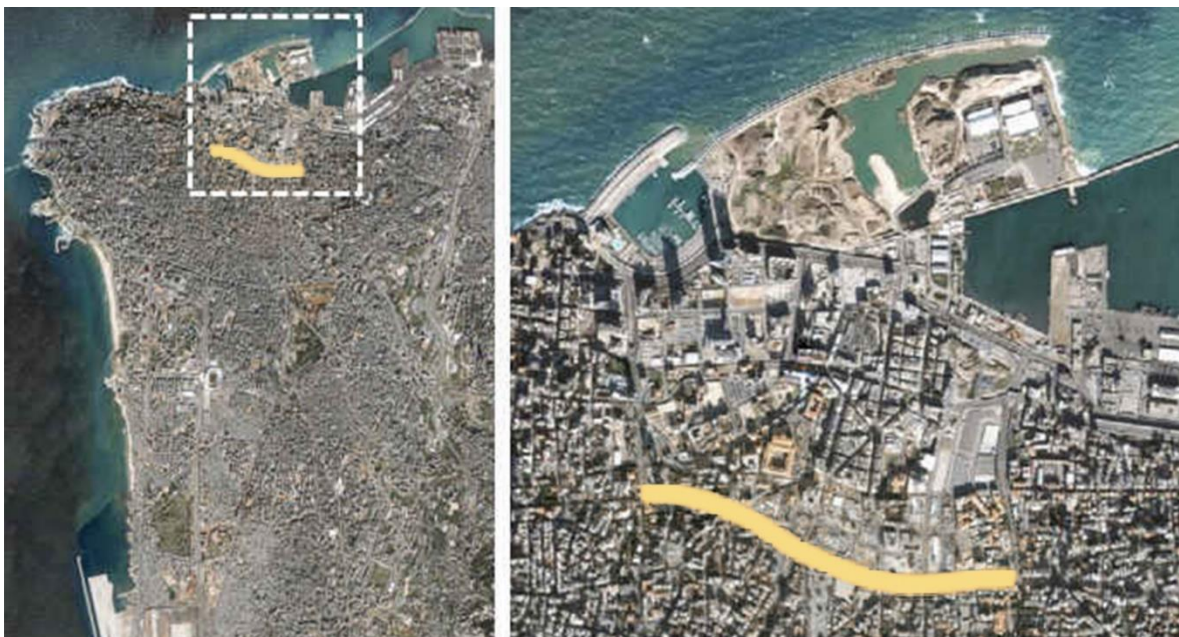

Fig.12: The Fouad Chehab highway within the urban fabric of Beirut
Source: Haidar (2016)

3.2.   Urban analysis of 'Fouad Chehab highway'

This section provides an overview of the site's topography, land use, and mobility as well as a thorough analysis of the site's legibility, cultural significance, and open spaces.

3.2.1. Existing block morphology, buildings heights and building condition

According to the examination of the block morphology, ongoing projects, and the height and condition of the existing structures, the site is divided between a core zone with significant potential for development and two nearby densely inhabited zones. The airport road and the Damascus Road, the two primary communication axes that traverse the ring road, are positioned between the first zone. This region has a lot of potential for development as it contains so many vacant lots and decaying structures. These unoccupied lots are clustered together on the BCD side into super-blocks (cities-scale blocks), which facilitate monolithic expansion, according to corporate legislative planning. Blocks that are abandoned or in disrepair on a neighborhood basis can be subject to reparcelization due of the inflow of high-rise buildings on the Bashoura side. Outside of this zone, more modest interventions may be done since there are clusters of decaying structures nearby that might be renovated or created. (Haidar 2016)
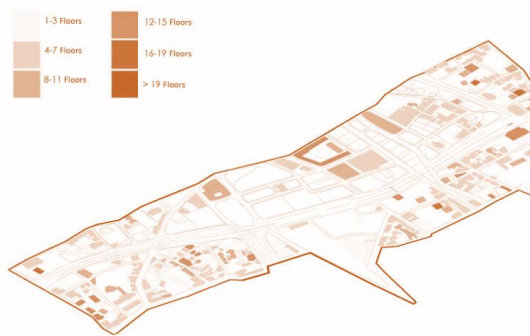

Fig.13: Existing buildings heights
Source: Haidar (2016)

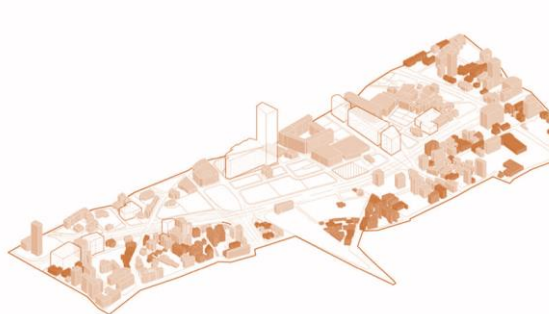Fig.14: Existing buildings condition
Source: Haidar (2016)

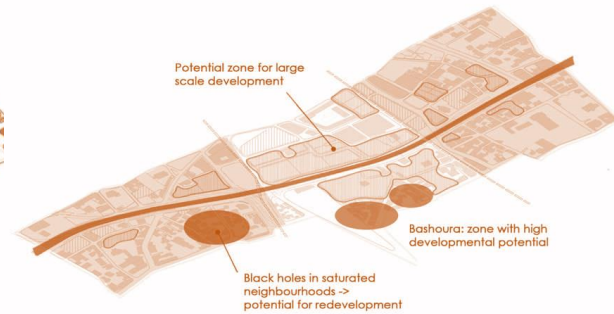Fig.15: Buildings under development
Source: Haidar (2016)

Fig.16: morphological analysis findings synthesized
Source: Haidar (2016)

3.2.2. Existing land-use

Further research indicated that the property is once again transversally divided into many land-use zones, even though the site was initially thought to be longitudinally divided into two zones by the highway (a hybrid city center at the north of the highway and the residential neighborhoods at its south).

The first zone, which is mostly residential, extends from the ring road's northern boundary (the Ghalghoul district) to the Zokak al Blat neighborhood. It adheres to a general district logic, with

middle-class residential use in the south and high-income residential use in the north. Services are available along both districts' limits. The airport road and the Damascus Road, the two main linking axes that traverse the ring road, are in the second zone, which is centrally located. Despite the absence of a particular land use or personality, this zone adheres to the edge logic. The application of Solidere rules in the north may promote the formation of a distinct cultural identity. The southern neighborhood's current urban fabric is deteriorating, and the area will probably become the edge of high-rise buildings used for upscale residential purposes. The third zone is a hybrid that includes both the USJ area and the Saifi area near the northernmost edge of the ring road (Saifi area). Edge logic is also used in this area. As a result, the inner northern and southern sides of the highway are zoned for high- and middle-income residential use, respectively, while the two highway margins are designated for commercial use.

3.2.3. Existing pedestrian and vehicular mobility

Ecochard constructed the ring-road, as was already known, to reduce inner-city traffic congestion and link the city center to the harbor, airport, and hinterland. A national axis (Damascus Street) links the still-recovering Solidere district to the harbor and the airport, while the ring road provides access to Beirut's major neighborhoods (such as Hamra, Achrafieh, and Ras Beirut) (such as Hamra, Achrafieh, and Ras Beirut).

This transportation system is the main cause of the physical division and segregation between the city's center and its suburbs. The ring road caused a significant rupture in the urban fabric and a barrier to pedestrian mobility, substantially reducing permeability to and from the city center. However, when the infrastructure deteriorates, the degree of such permeability changes. The airport roadway and the Damascus Road once again divide the site into three halves based on transverse permeability levels. On the section of the highway that runs through Zokak Al Blat, through and access traffic are divided vertically.

Fig.17: the ring-road and connectivity at a city scale
Source: Haidar (2016)

The neighborhoods are still securely connected and share a single public median garden, but the impact of the break on both sides of the road is lessened by this separation. The horizontal division of through and access traffic draws attention to the break in the middle of the route. Because of this, the street hierarchy that before the building of the highway is no longer in place Road networks are segregated, pedestrian permeability to and from the city center is drastically reduced, and small entrances and tiny streets flow directly into the motorway. At the intersection of the Georges Haddad and Fouad Chehab motorways, which marks the end of the third and final length, there is a little separation between through and access traffic. Both the ring road and the Damascus Road are vertically separated. (Haidar 2016)

3.2.4. Connectivity and legibility

The development of a strategy that encourages the highway's readability as cultural infrastructure required analysis of the connecting attributes. Connection is the actual, observable continuation of the city fabric over the road. When mapping connectivity, we considered both the highway as perceived by its users and the highway as a component in vehicle connections. As a result, the map's elements convey both a general idea of the area as well as the route's physical and visual connectivity. These elements consist of:
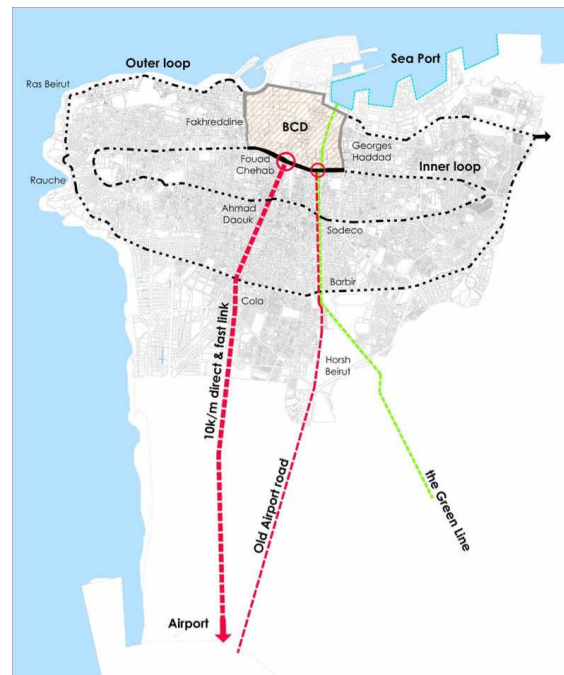
Nodes are strategic intersections and focal points. Three key nodes along the route were noted. Node Number One is the junction of the main vehicular axis connecting the city to the international airport and the highway. It is essential that the highway converge at Node No. 2 with the axis connecting Damascus, the BCD, and Beirut's Sea port. It is also very notable as this crossroads is where the "Green Line" of Beirut meets the highway. Additionally vital locally is the third node, which is essential for pedestrian permeability and cross-district contact between the BCD and the Zokak al Blat District.
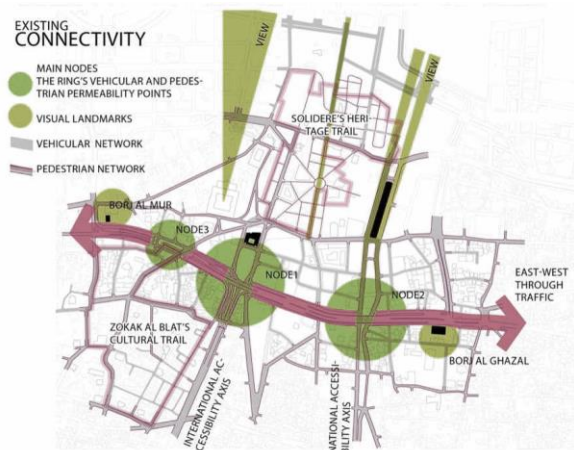
Paths are the routes that guests use around a property; they are important because they coordinate urban flow. The importance of the

Fig.18: Connectivity and legibility map
Source: Haidar (2016)

mobility networks for vehicles and pedestrians, two distinct groups, was highlighted beside and adjacent to the highway. The highway is shown on the map as a significant route that allows for both north-to-south pedestrian permeability and east-to-west through traffic. In addition, the history trail of Solider and the Zokak al Blat cultural trail are significant components of the transportation networks. The former is a 2.5 km walking circuit connecting archeological sites, historic public spaces, and heritage buildings within the historic core of Beirut city center, whereas the latter is a trail suggested by non-governmental organizations to highlight the cultural value of the Zokak el Blat district and encourage the preservation of the remaining heritage sites within it .

Visual landmarks serve as external compass points since they are distinctive features of the urban environment. The two most obvious visual markers in the study area are "Borj el Mur" and "Borj al Ghazal," two gigantic buildings that substitute for the opposite ends of the route. Additionally, the axis along Martyrs Square and the view from the highway looking towards the Grand Serail are two important visual corridors that are highlighted. (Haidar 2016)

3.2.5. Existing, projected, and potential cultural spaces

As part of the strategic study, the varied planned, existing, and prospective cultural buildings in the research area were mapped and classified into the following categories.
Plans for cultural buildings include "The House of Arts and Culture in Beirut," Lebanon's first major cultural project, which will be located on the BCD side of the territory between the northern and southern edges of the Fouad Chehab expressway. The effort, which was envisioned as an incubator rather than a museum, aims to foster culture, stimulate innovation, and educate the whole population, not just children. It will be located in the Ghalgoul District, at the foot of the majestic Grand Serail, making it highly visible and easily accessible from the road. (Haidar 2016)
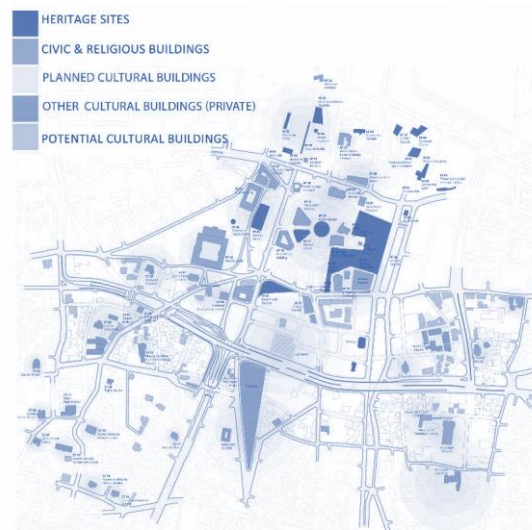

Fig.19: Cultural spaces, strategic analysis map
Source: Haidar (2016)

In the context of this concept, archaeological sites and historic public spaces are classified as heritage sites. The cultural sites surrounding the route include the Beirut Souks (which still retain an Ottoman entry gate and a 2,500-year-old street grid), the Roman Baths, the City Wall archeological remnants, Riad al Solh Square, Nejmeh Square, and the projected Garden of Forgiveness. There are a few (historical) buildings in the study area as well, however owing to their function, they were mapped under the "Civic and Cultural buildings" category. Several municipal and religious structures can be seen along the Fouad Chehab route. The Grand Sarail, the CDR building, Beirut's municipal building, the National Conservatoire, the Grand Theatre, Al Omari Mosque, St. Luis Capuchin church, St. George Maronite cathedral, and St. George Greek Orthodox church are just a few of the buildings on the BCD side that have heritage value and have been restored and classified. The Zokak Al Blat neighborhood, which served as the setting for the Arab Cultural Renaissance, is located on the southern side of the highway and is home to many of these buildings. On the southern side of the path, one may see the Zokak al Blat Mosque, Notre Dame de l'Annonciation Church, Museum of Prehistoric History, Mono Theater, and other civic and cultural icons. This category contains privately owned, frequently off-limits to the public educational and cultural structures, as well as private educational and cultural institutions. The Librerie du Liban Publishers publishing house, the Greek Catholic Patriarchal school, the Lycee Abel Kader, the Orient institute, Dar Al-Aytam, the Hariri high school, the St. Joseph university, and others are among the buildings that make up this group. This category includes privately owned buildings with considerable architectural merit that might be utilised for cultural purposes. Solidere has saved the bulk of these buildings on the northern side of the road, although they remain uninhabited. However, on the southern side, many of these buildings are in disrepair and in risk owing to current construction laws and property speculation. (Haidar 2016)

3.2.6. Existing open spaces

Open spaces are used for public meetings, as well as societal interaction and expression. People from different socioeconomic and cultural backgrounds come together for mutual enjoyment in the city's plazas, parks, markets, and natural areas. Furthermore, when their experiences are repeated, these locations evolve into containers that communicate cultural processes and social value (Amin, 2008). As a result, a study of these topics was required as part of our site's strategic analysis. There are two networks of outdoor spaces in Beirut. The first one was constructed by Solidere, which used its master plan and design guidelines to create a lovely network of interconnected streets that integrated various open public spaces (like public gardens, archeological sites, and inner-block communal spaces) into a pedestrian-friendly environment. Eight open public spaces are connected by the second network, which spans the entire city and passes through Horsh Beirut, the Hippodrome, the Sanayeh Garden, the Syoufi Gardens, and the Cornice of Beirut. There are various open spaces scattered along the route and its surroundings between these two networks. (Haidar 2016)
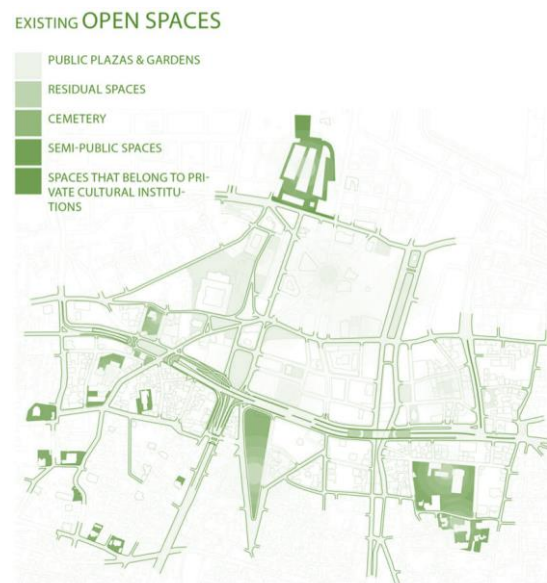

Fig.20: Existing open spaces, strategic analysis map
Source: Haidar (2016)

3.3. Identifying problems of 'Fouad Chehab Ring Road'

The Fouad Chehab highway, a through-traffic road that runs along the southern edge of Beirut's Central District, is the subject of this research since it creates a gap in the infrastructure (BCD).

The French urbanist Michel Écochard created the 1963 Beirut master plan, which included this route, with the intention of reducing traffic in the city's central area. By slicing through the continuous urban structure that made up the medieval town's original expansion, this inner-city road formed. Two adjacent, geographically and socially segregated areas that are following two different growth cycles. Under the guidance of Solidere, a private real estate corporation working in a public-private partnership, the BCD on the northern side has developed into a state-of-the-art postwar restoration region. Bashoura and Zokak al Blat, two established inner-city neighborhoods, are being subjected to market-driven ad hoc building on the southern side, which is having an impact on their social structure and economic foundation. A stagnant, transitional highway interface zone without any discernible urban or architectural identity. On the Bashoura and Zokak Al Blat residential sides of this interface, which is emerging as a cultural hub, it delineates a deteriorating edge with vacant lots and dilapidated traditional structures waiting to be redeveloped into a high-rise frontage with strategic views over the city center. Dar Beirut, a significant cultural center that will visually connect the city center to the highway, is located on the BCD side of this interface. (Haidar 2016).

Fig.21: Bird-eye view of the Fouad Chehab Highway taken from Saifi
Source : Haidar 2016

3.4.   Selection of a specific area in 'Fouad Chehab highway'

Choosing a particular location of the Fouad Chehab highway in the research, the cultural corridor in the heart of Beirut, as indicated in Fig 22, is selected to focus on the investigation. It is positioned in two parallel plots in the two divisions of the line that permit to continue the cultural corridor starting from the center of Beirut. 'The Urban Zone,' which acks green spaces and cultural, social, and leisure resources. Furthermore, this completes the cultural map of Beirut cultural places. Also, it is in the middle of the two main streets that increases the importance of the selected areas.
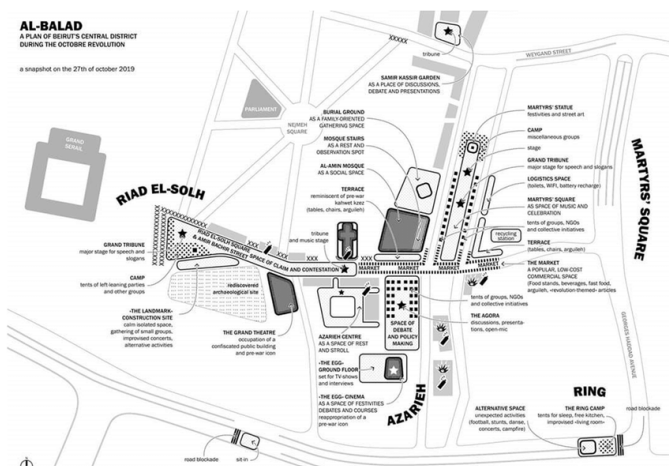
Fig.22: Al-Balad, a plan of Beirut's Central District during
the 2019 Lebanese Uprising
Source: Atallah (2019)

Fig.23: map showing the selected sites

3.5.   Analysis of parameters:

3.5.1. Social Cohesion:

The Fouad Chehab Bridge, which connects the Beirut Central District to the surrounding areas, has been a physical and symbolic barrier between the two regions. This has resulted in a lack of social cohesion among the residents of these areas. The Beirut Central District, which is the commercial and financial center of the city, attracts tourists and investors, while the surrounding areas are predominantly residential and lower income. This has led to a sense of marginalization among the residents of these areas and a feeling of exclusion from the benefits of economic growth.

3.5.2. Vitality:

The Fouad Chehab Bridge is a concrete structure that dominates the urban landscape and creates a visual and physical barrier between the Beirut Central District and the surrounding areas. This has resulted in a lack of vitality and livability in the surrounding areas, as the bridge creates a sense of isolation and neglect. Additionally, the traffic congestion on the bridge has contributed to air pollution and noise, which further degrades the quality of life in the area.

3.5.3. Values:

The Fouad Chehab Bridge represents a symbol of division and exclusion in the urban landscape of Beirut. The bridge is a physical manifestation of the political and social tensions that have shaped the city's history. By breaking down this barrier and creating a green network that connects the different areas of the city, the project can help shift the values of the community towards inclusivity, sustainability, and collaboration.

3.5.4. Breaking Barriers:

The Fouad Chehab Bridge is a physical and symbolic barrier that separates the Beirut Central District from the surrounding areas. This has created a sense of division and exclusion among the residents of these areas. By breaking down this barrier and creating a green network that connects the different areas of the city, the project can help create a sense of unity and inclusivity among the residents of Beirut.

3.5.5. Green Networking Approach:

The green networking approach involves creating a network of green spaces that connects different areas of the city. This can include parks, gardens, and other public spaces that promote biodiversity, sustainability, and social interaction. By creating a green network that spans the Fouad Chehab Bridge, the project can help create a sense of continuity and connectivity in the urban landscape of Beirut.

3.6. Different perspectives of public on 'Beirut ring road'

This study preferred to meet a sample of the public who had experience and knowledge, that work in the specified region of the ring road to get credibility and greater engagement with people. The study used two easy field approaches to identify the sample's point of view, visions, wants, and memories: conducting interviews and an online questionnaire form, as shown below.

3.7. Different perspectives of public on 'Beirut ring road'

This study preferred to meet a sample of the public who had experience and knowledge, that work in the specified region of the ring road to get credibility and greater engagement with people. The study used two easy field approaches to identify the sample's point of view, visions, wants, and memories: conducting interviews and an online questionnaire form, as shown below.

3.7.1. Holding Interviews

Face-to-face interviews were conducted on October 29, 2022, with urban designer and senior tourist guide persons who worked near the Beirut ring road and had many unique recollections with the region. Three questions were asked during the interviews:

a) Can you describe your experiences with the Fouad Chehab bridge and the surrounding areas?
b) How do you feel about the level of social cohesion and vitality in the communities on either side of the bridge?
c) In your opinion, what factors contribute to the divide between the Beirut Central District and the surrounding areas?
d) How do you think green networking could help in revitalizing the area and promoting social cohesion?
e) Are there any potential challenges or concerns you see with implementing a green networking approach in this area?

Most of the responses were similar; examples of these responses are shown in the following quotations:

Sarah Hassan, 28 years old:

> "I live in Bachoura and I used to feel like the bridge was a barrier between us and the surrounding areas. However, recently I've noticed more efforts being made to connect the two sides with pedestrian bridges and green spaces. I think it's important to have a sense of community and connectedness within the city, and these efforts are definitely improving that ".

Ali Abbas, 35 years old:

> "I drive on the first ring road every day for my commute, and I've noticed that it's often congested and can be difficult to navigate. I think it would be helpful to have more public transportation options and bike lanes to encourage people

to use alternative modes of transportation. Additionally, adding more green spaces and walkways could make the area more enjoyable to traverse on foot ".
Sanaa Khalil, 42 years old:

"As someone who owns a business near the bridge, I've noticed that foot traffic can be low at times due to the perceived distance between the central district and the surrounding areas. I think it would be helpful to have more events and activities that encourage people to explore the entire city, rather than just staying within their own neighborhood. Additionally, creating more public gathering spaces like plazas and parks could bring people together and improve social cohesion within the community ".

3.7.2. Questionnaire

A closed questionnaire was prepared and generated on an online platform and sent to 100 educated persons (engineers, architects, economist, and business owners) between the ages of 20 and 40. This questionnaire was sent on social media. The following questions were stated in this way and were directed, concise, and specific:

a) To what extent do you feel a sense of belonging and connectedness within your community?
b) How important is it for you to have accessible and well-maintained public spaces in your community?
c) What values do you think are important in the way public spaces are designed and used?
d) How do you feel about the current state of the Fouad Chehab bridge and the impact it has on the surrounding areas?
e) Do you believe that green networking could be a solution to revitalizing the borderlines between Beirut Central District and the surrounding areas?

The study evaluates outcomes and conclusions of replies after attaining the field methods.

4. Findings

Through using an analytical methodology, results of answers are presented in form of charts.

4.1.   Analysis of interviews results

The replies to the interviews may be used in the paper to generate a list of requests that might immediately improve and revitalize the ring road borderline. This list is shown in table 2 below.

Table 2: A presentation of the checklist of needs

Open Green Public Spaces	Social & Cultural Promenade	Recreational Facilities & Entertainment
Public Park and open sport facilities	Park and pathways and bicycle tracks	Museum, Workshops, retail shops, amphitheater

Table 2 shows how to revitalize the ring road borderline by adding landscape elements, a cultural promenade, as well as recreational amenities & entertainments.

4.2.   Analysis of questionnaire results

The results are shown in a collection of statistical diagrams, some of which have been altered to reflect the diverse cultural, social, and economic backgrounds. Figures 24, 25, 26, and 27 show pie charts that show the findings. The pie charts show the opinions of the people who live along the ring road, who have very poor circumstances overall (40%), which are also 30% of the reason for their

poor conditions being related to politics. Applying several options, such as sustaining green spaces (29%), cultural areas (24%), promenades (22%), and social interactions (19%), would enhance the connectivity through Beirut ring road. As previously noted, social and cultural activities account for 81% of facility requests, followed by recreational amenities and entertainment (10%) and educational (9%). Through better, healthier, and more productive activities, the area might be revitalized.
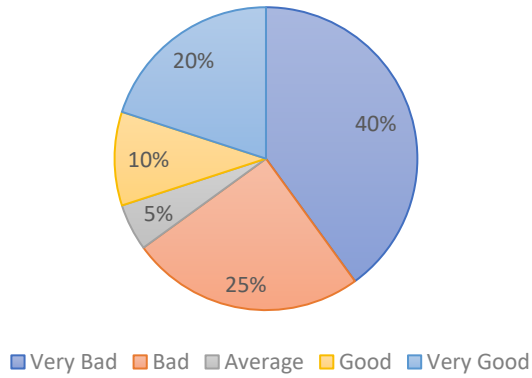

Fig.24: Pie Chart showing opinions of Beirut rin road
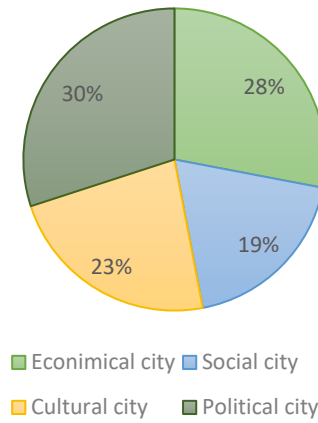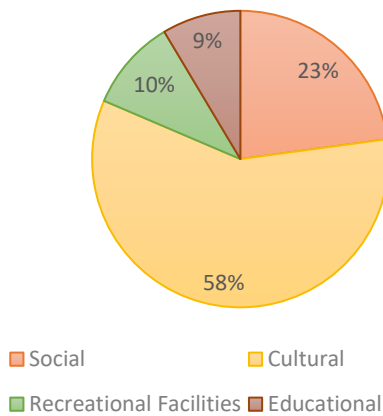

Fig.25: Pie Chart showing percentage of Beirut divisions

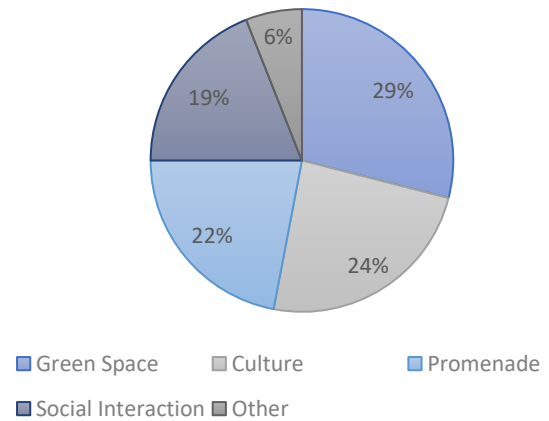Fig.26: Pie Chart showing the needs of city center activities

Fig.27: Pie Chart showing connectivity expectations of the city

5. Discussion

The responses from both methods showed that there is a desire among the public for more public spaces, recreational facilities, cultural areas, and green spaces. The interviews revealed that efforts to connect the two sides of the ring road through pedestrian bridges and green spaces have been noticed and appreciated. The questionnaire showed that social and cultural activities were the top request for facilities, followed by recreational amenities and entertainment and educational facilities. Overall, the findings suggest that revitalizing the ring road through landscape elements, cultural promenades, and recreational amenities can help promote social cohesion and revitalization in the area. It is important to note that the sample size of the study was limited to a specific group of individuals who worked near the ring road and educated individuals between the ages of 20 and 40. This means that the findings may not be representative of the wider public's opinions on the Beirut ring road. Additionally, the study did not explore the potential challenges or barriers to implementing the suggested improvements, which could be important to consider when planning and implementing changes.

6. Conclusions and recommendations

Based on the findings of the research, several conclusions and recommendations can be made to improve urban areas and promote social cohesion:

Conclusions:

- The public has a strong desire for more public spaces, recreational facilities, cultural areas, and green spaces.
- Pedestrian bridges and green spaces are appreciated by the public and can help connect different parts of the city.
- Social and cultural activities are the top request for facilities, followed by recreational amenities and entertainment and educational facilities.
- Revitalizing the ring road through landscape elements, cultural promenades, and recreational amenities can promote social cohesion and revitalization in the area.

Recommendations:

- Incorporate more public spaces, recreational facilities, cultural areas, and green spaces into the design of urban areas, particularly in areas that have been neglected or underutilized.
- Consider pedestrian bridges and green spaces as a means of connecting different parts of the city, particularly areas that are physically separated by highways or other infrastructure.
- Prioritize the development of social and cultural facilities in urban areas, as these are seen as particularly important by the public.
- Encourage the development of recreational amenities and entertainment and educational facilities in urban areas to create vibrant and dynamic spaces.
- When designing green spaces and other landscape elements, consider the potential for these spaces to promote social cohesion and community building.
- Engage with the wider public to gain a better understanding of their needs and desires when designing urban areas.
- Consider potential challenges or barriers to implementing improvements and seek to address these early in the planning and implementation process.

Overall, by implementing these recommendations, urban areas can be transformed into more livable, enjoyable, and socially cohesive spaces that meet the needs and desires of the public.

Reference:
- Alberti, M., & Marzluff, J. M. (2004). Ecological resilience in urban ecosystems: linking urban patterns to human and ecological functions. Urban ecosystems, 7, 241-265.
- Anzaldua G (1987) Borderlands/La Frontera: The New Mestiza. San Francisco, CA: Spinsters/Aunt Lute.
- Benedict, M. A., & McMahon, E. T. (2012). Green infrastructure: linking landscapes and communities. Island press.
- Comaroff J and Comaroff JL (2007) Law and disorder in the post colony. Social Anthropology 15(1): 133–152.
- Cogley, Bridget 'BIG Unveils Park-Covered Freeway for Brooklyn's Waterfront" Dezeen, www.dezeen.com/2019/04/03/bqp-big-news-bqe-brooklyn- freeway -park/ (19 Mar. 2020)
- Firehock, K., & Walker, R. A. (2015). Strategic green infrastructure planning: a multi-scale approach. Island Press.
- Gill, S. E., Handley, J. F., Ennos, A. R., & Pauleit, S. (2007). Adapting cities for climate change: the role of the green infrastructure. Built environment, 33(1), 115-133.
- Haidar, H., & Amin, Z. (2016). Re-conceptualizing infrastructural breaks: Beirut's Inner City ring road as cultural infrastructure (Doctoral dissertation).

– Hirschfield A, Birkin M, Brunsdon C, et al. (2014) How places influence crime: The impact of surrounding areas on neighborhood burglary rates in a British city. Urban Studies 51(5): 1057–1072.

– Johnson, R. L., & Staeheli, P. (2006). City of seattle—Stormwater low impact development practices. In World Environmental and Water Resource Congress 2006: Examining the Confluence of Environmental and Water Concerns (pp. 1-10).

– Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.A., Tew, T.E., Varley, J., and Wynne, G.R. (2010). Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.

– Li, S. (2018). Folks as experts: inspiring community participation in transforming brownfields into green spaces (Doctoral dissertation, University of Georgia).

– Mazower, D. (1998). AL Cohen's 'The Memorable Sunday'. Jewish Culture and History, 1(2), 195-202.

– Parker, N. (2008). A theoretical introduction: spaces, centers, and margins. The geopolitics of Europe's identity: Centers, boundaries, and margins, 3-23.

– Pieris, A. (Ed.). (2019). Architecture on the Borderline: Boundary Politics and Built Space. Routledge.

– Rouse, D. C., & Bunster-Ossa, I. F. (2013). Green infrastructure: a landscape approach (No. 571).

– Sibley D (1995) Geographies of Exclusion: Society and Difference in the West. New York: Psychology Press.

– Smith, M., Moseley, D., Chetcuti, J., & de Loanni, M. (2008). Glasgow and Clyde Valley Integrated Habitat Networks. Report to Glasgow and Clyde Valley Green Network Partnership. Edinburgh: Forestry Commission.

– Stoss landscape urbanism. The Loop + the Stitch Chouteau Greenway. Http://Greatriversgreenway.org/Wp-Content/Uploads/2018/04/Chouteau-Greenway-stoss-Design-Report.pdf.Stoss landscape urbanism, (4 April 2018)

– Vis, B. N. (2018). Cities made of boundaries: mapping social life in urban form. UCL Press.

– Wacquant L (2008) The militarization of urban marginality: Lessons from the Brazilian metropolis International Political Sociology 2(1): 56–74.

– Wilson, T. M., & Donnan, H. (2012). Borders and border studies. A companion to border studies, 19, 1-26.

– Zerubavel E (1981) Hidden Rhythms: Schedules and Calendars in Social Life. Chicago, IL: University of Chicago Press.

– Zhang, Z., Meerow, S., Newell, J. P., & Lindquist, M. (2019). Enhancing landscape connectivity through multifunctional green infrastructure corridor modeling and design. Urban forestry & urban greening, 38, 305-317.