AMERICAN UNIVERSITY OF BEIRUT

GREEN INFRASTRUCTURE AS AN URBAN DESIGN STRATEGY TO ENHANCE CONNECTIVITY IN THE CITY OF SAIDA

by:
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AN ABSTRACT OF THE THESIS OF

Rabab Salim Hammoud for Master of Urban Design
Major: Urban Design

Title: Green infrastructure as an urban design strategy to enhance connectivity in the city of Saida.

The thesis addresses connectivity problems in the city of Saida resulting from current zoning regulations and vehicular-based planning. Current zoning practices focused on real-estate evaluation and have resulted in the loss of the historical integration of the city and its surrounding landscape. Roads and streets that have developed since the 1980s have resulted in the loss of an agricultural asset being replaced by neighborhoods that are isolated from one another lacking urban character, identity, and walkable experience. To address this issue, green infrastructure is presented as an urban design strategy to reconnect the city with its surrounding landscape and develop an urban scale network that integrates neighborhoods by providing a cohesive urban experience through walkable connections across the city. Based on the blue-green network strategy proposed by the USUDS (Urban Sustainable Development Strategy) report for Saida, this thesis develops part of this strategy at the urban scale to demonstrate possibilities of pedestrian and natural networks in the city. It proposes an urban design intervention at one of the city's water streams in the aim of providing a prototype for possible future project implementation. It highlights the historical and natural assets of the targeted area, provides a connected urban space, and enhances the public realm of the city.

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CHAPTER I

INTRODUCTION

The urban planning approaches, in the early to mid-20th century, were driven by car dominated themes and single use zoning. While these approaches were perceived, during their time, as novel and new, cities today are realizing the impact of such approaches. Although many cities have gone beyond these approaches towards more contextualized planning tools, many cities continue to employ these approaches regardless of their detrimental impacts on city fabric, identity, and character. Furthermore, these development approaches come at the expense of ecological degradation and loss of open space. Roads are not designed at a scale to accommodate pedestrian activity. They usually don't ensure a welcoming experience nor an adequate place to walk. The road network plan is automobile centered (Southworth et al, 2003).

In fact, urbanized populations are expected to increase up to 60% of the world population by 2030. While cities are facing a phase of urban disconnectivity and high vehicular dependency. This reflects on city livability, and resident's urban perception. As, it threatens the city's natural systems (Jenks et al, 2013). Most cities today are structured around vehicular arteries. Roads act as the main organizing tool in modern cities, giving vehicles precedence. They break visual, social and physical connections (Reed & Chakraborty 2013). They also hinder pedestrian connectivity and result in major fragmentation of natural systems (Forman et al., 2003). Furthermore, they are a main source of air and noise pollution and are heavily resource dependent. In other

words, vehicular transportation lines negatively affect the community quality of life (Reed & Chakraborty 2013).

Spatial planning is a main tool for promoting healthy decisions. Connectivity of street layouts and accessibility to green open spaces are two of the main factors that have a direct influence on the public health of the community (Urban-Nexus, 2013).

Moreover, in the context of Lebanon, the built urban form is shaped by a series of singular developments with no comprehensive plan to guide the city expansion. This is the result of the outdated zoning practices that primarily highlight the land as a commodity for real estate developments. Zoning regulations, which can act as "place-breakers" instead of "place makers" (Adams & Tiesdell, 2012 p:13), are being implemented regardless of the possible negative effects that they may have on the urban fabric. Consequently, the result is an "unintentionally" yet not an "accidental" city (Adams & Tiesdell, 2012).

A. Thesis Objectives

The thesis addresses the degraded connectivity in the city of Saida by analyzing the impacts of vehicular arteries and outdated zoning on the inner-city fabric and on the relation of the city with its adjacent natural and built environment. Based on the USUDS proposal of a blue-green network, the thesis will develop part of this proposal into a more detailed city strategy aiming to enhance connectivity through employing the historical water courses in the city of Saida and the neglected rail line. This approach will provide the city of Saida with a network of green infrastructural spaces that is foreseen to improve connectivity and movements within the city.

B. Research Question

The USUDS report is the starting point of the thesis through proposing to revitalize the neglected blue and green assets in the city of Saida. Therefore, the research question that will guide the thesis is:

What is the potential of developing a green-blue infrastructural network, as recommended by the USUDS report, to improve human and ecological connectivity within the expanding urban fabric of Saida?

C. Thesis Hypothesis

Revitalizing the derelict blue-green spaces based on the USUDS proposal into a network of green infrastructure will enhance human and ecological connectivity in Saida to improve overall quality of living.

The thesis will discuss the existing city scenario through detailed historical analysis to deduct the factors that aided or hindered connectivity in the city. It will also highlight the city historical water streams and the green assets intersecting the rail line that are the basis of the USUDS proposal to evaluate the extent to which it can be transformed into an active and open green infrastructural network. The network aims to link the city from the sea shoreline to its extensions on the hillside. Based on the diverse character zones derived from the analysis in Saida, different thematic connectivity themes will be proposed.

D. Thesis significance

The findings of this study contribute to the literature on Saida and further develop the understanding of urban dynamics. It explores some of the possibilities of green infrastructure as a newly applied urban design tool in Lebanon. Through exploring part

of the USUDS proposal and developing a prototype intervention area, the project demonstrates the applicability of green infrastructure within a Middle Eastern city context. The City of Saida will be used as a case study. This highlights the value of the decaying natural resources in the city and shows how they can be regenerated to serve the communities in Saida. The study demonstrates how existing conditions can be transformed into meaningful open spaces and explores their viability as connecting urban elements. The results of this study can serve as a prototype for Mediterranean coastal cities in the Middle East.

E. Case study profile

Saida, is a coastal city, located 45 kilometers south of Beirut. It is part of the south Lebanon governorate. Saida is the third-largest city by population after the capital and Tripoli, with an estimation of 110,000 inhabitants in 2013 (Al Harithy et al,2013) and 60,151 registered voters in 2016 (Ministry of Interior and Municipalities as cited by Localiban, 2016). It covers a surface area of 786 ha (Localiban, 2016).

Saida is the first city the Phoenicians built in 2800 B.C (Nache, as cited by Saida gov.,2013). It is known historically for its strong relationship with the sea and its surrounding landscape, which inspired its name in Arabic as the fishing activity (الصيد). The city old port played a vital role connecting the city with the region through trade activity at different eras. It was also the main port for Damascus and internal Syria being the closest port and the most accessible one throughout the year (Saida gov.,2013).

Furthermore, the city is rich in natural resources. Multiple watercourses bisectthe city. It is bounded from the north with Al Awali River, and from the south with Sayniq river. The abundance of water bodies made agriculture a main feature along

the coastal plain, with mainly citrus trees. This yielded agriculture as the base of the economy of the city for a long time (Saida gov.,2013). However, this historic relationship of the city with its sea and land is being lost due to inadequate planning regulations, and the dominance of vehicular arteries in the city.

Saida is negatively affected by infrastructural projects that focus on the roads as a tool to facilitate vehicular access rather than highlight the intrinsic values of the city (Lilmadina by Dictaphone,2015). The city is labelled as the gate of the south. By focusing on North-South vehicular connection, the city is increasingly becoming a bypass area rather than becoming an attraction center (Al Harithy et al, 2013). Saida within its limited width is bisected by two wide vehicular arteries to enhance North-South connectivity. This negatively affected the city urban realm and strained it to be a through traffic zone. These road arteries are defined as follows: First, the coastal boulevard that was executed after the civil war in 1993. It aimed to connect the capital city with the south. The road detaches the city from its sea with high speed traffic lanes. Second, the eastern boulevard, executed in the 1980 (Al Kalash, 2001) to release the congested city streets and ease North-South connectivity. It cuts the city inner fabric and represents a heavy traffic artery. To add, Al Sultaneye expressway at the fringe between the city and its hinterland is also planned to facilitate North-South vehicular circulation. The Sultaneye road decree was issued in 1972 and still not implemented till the date. The narrow existing road is under study in the meantime to be widened as a solution to the North-South increasing traffic load. This would disconnect the city from its expansions in its adjacent hills.

Moreover, the building regulations (المخططات التوجيهية) in Saida are over simplistic, and are usually proposed by inexperienced unqualified people (SOE, 2010).

The undervalued data about the cultural, economic, social and natural characteristics in the city resulted in general ambiguous zones that addresses only the building density and land use (SOE, 2010). These zoning plans are considered fixed mechanisms that aren't capable of coping with the rapidly evolving city (Van Den Broeck, 2004) nor of presenting sustainable solutions (De Meulder et al., 2004).

Consequently, the city's connectivity is facing major ramifications. It is invaded by monotonous concrete structures (developments) with minimal regulatory guidance, giving the marketplace the power to control the space. No further regulations are set to develop a better urban space in the city. To add, the historical and public sites are not well preserved and defined within the larger urban fabric of the city. They are not highlighted with activities and performance shows that promote their livability.

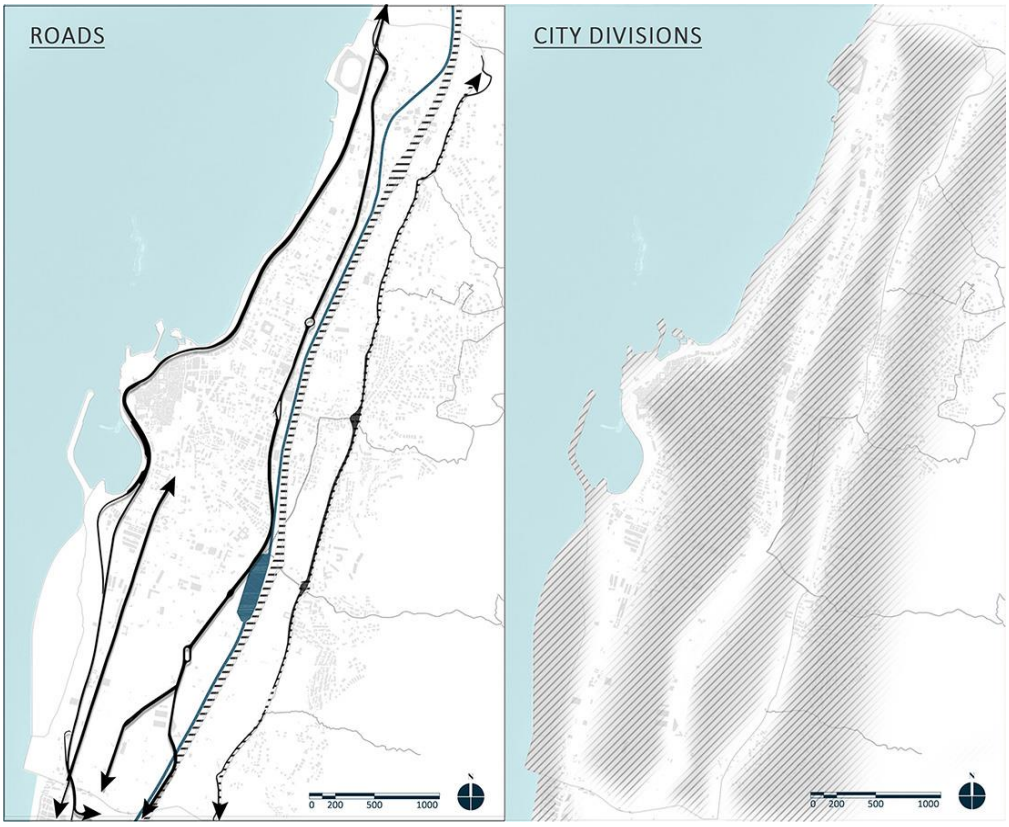


Figure 1:Map of main roads facilitating north-south vehicular activity and bisecting the city sphere. Source: Author

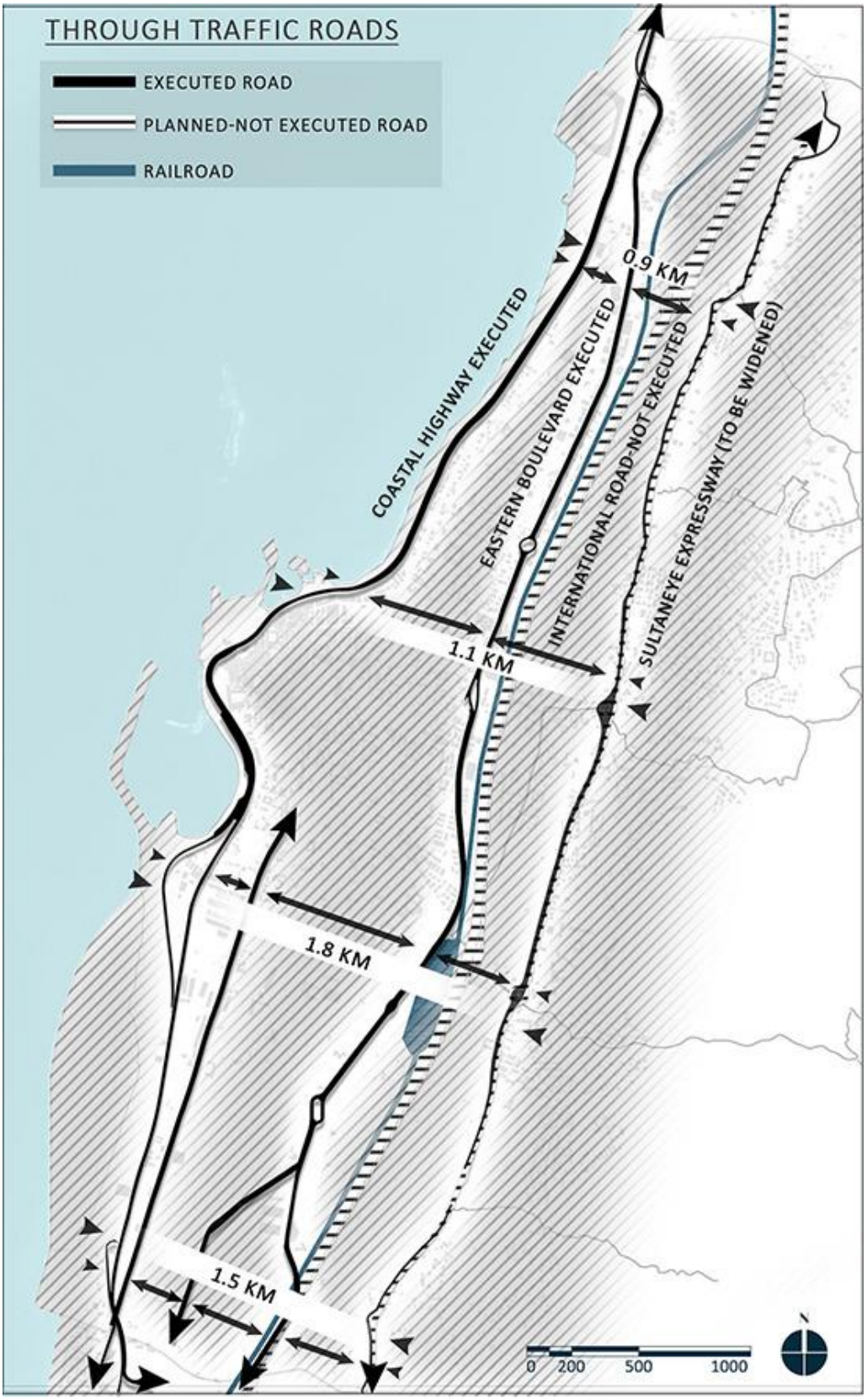


Figure 2: Map of main roads facilitating north-south vehicular activity and bisecting the city sphere. Source: Author

Furthermore, the unique social cohesion and street life is degrading in the city. Saida among other major cities in Lebanon is characterized by lack of open spaces such as parks and well maintained public beaches. This degrades the quality of living in the city and reduces community meetings possibilities (SOE,2010, p:228). The focal public space in the city is the waterfront. However, the coastal highway that was intended to ease vehicular circulation bisects active parts in the city. It is built on a fragment of the sandy beach, destroyed part of the historical castle bridge, and isolated the waterfront from the city (Dictaphone,2015). The seafront of the old city became disconnected form the coastal public space (Corniche) by a wide motorway which negatively affected the amusement and physical activities along the waterfront (Lilmadina by Dictaphone, 2015). Two new gardens were opened recently, Al Soudi Garden and Al Reaya Garden, both located along the coastal line. The two are not easily accessible due to the coastal boulevard. Furthermore, the municipal garden is the main public space within the city fabric. It is inaccessible, unplanted, and not maintained. The space is mainly a leftover that fails to represent a shared space for the community.

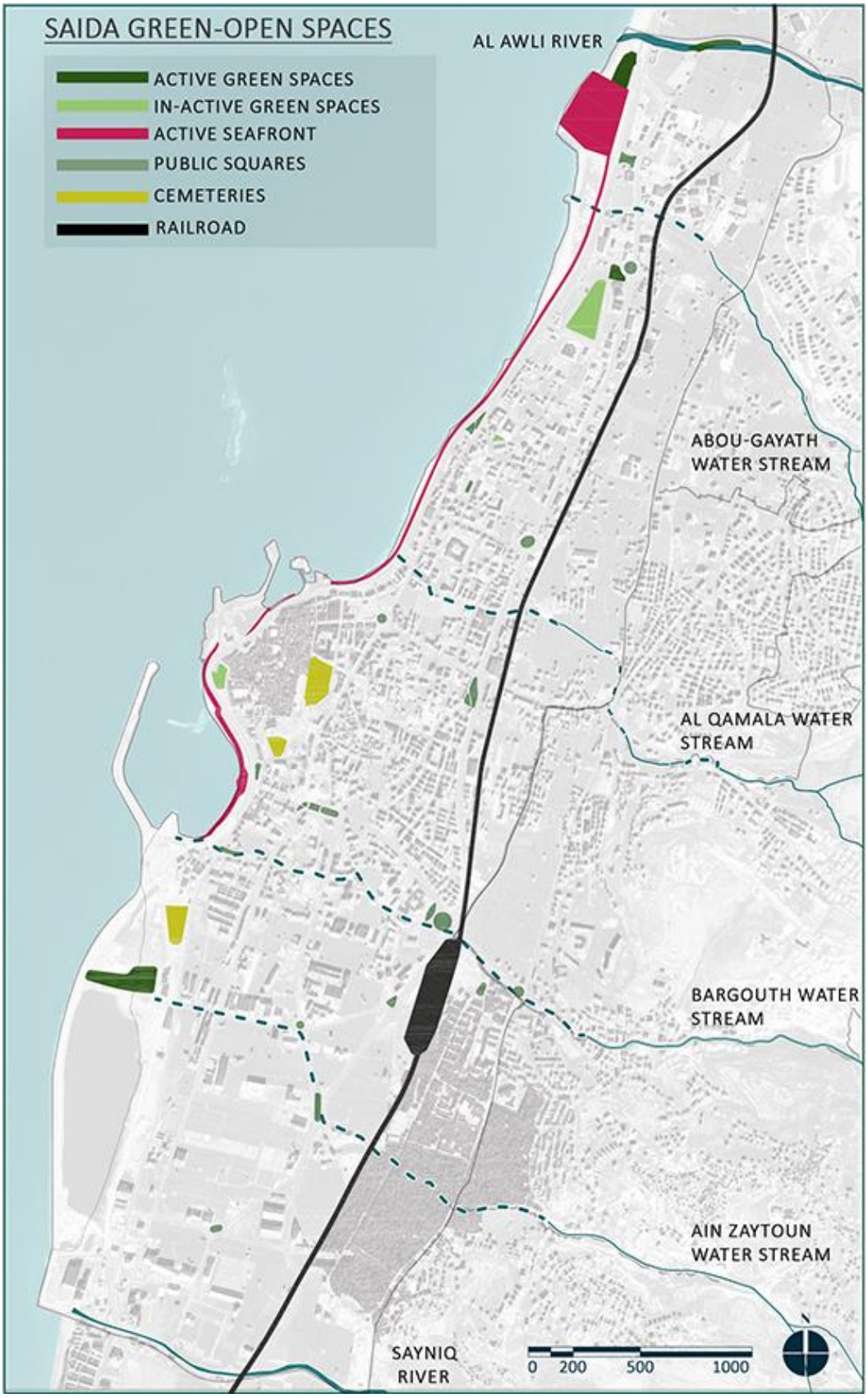


Figure 3: Map of Main Public Green Spaces. Source: Author

Figure 4: Saida Municipal Garden. Source : Makhzoumi et al. 2013, 83.

Furthermore, the biodiversity in the city is threatened and gradually being lost. Saida had been historically known as an agricultural city. The lemon blossoms in spring fill the air with a powerful fragrance giving the city its unique identity. However, today the city is losing that distinctiveness. Saida that had more than 470 ha of agricultural lands in the 1960's has lost more than half of this area for the sake of real estate projects (Makhzoumi et al. 2014). The main urbanization catalyst was the Israeli invasion in the 80's. Many residents from the neighboring villages fled to Saida to seek a safe haven, which rapidly increased the population density in the city. As a result, land pooling project was executed on the north-western part of the city (Western Wastani). The law permitted a low to medium density developments in the agricultural areas, thus failed to preserve the historical land character. Moreover, the increase in land prices in the city reflected on the economical return of agriculture, which as time passed became less profitable. Today, as the city grows, more agricultural lots are lost with an average of 9 ha every two years (Makhzoumi et al. 2014).

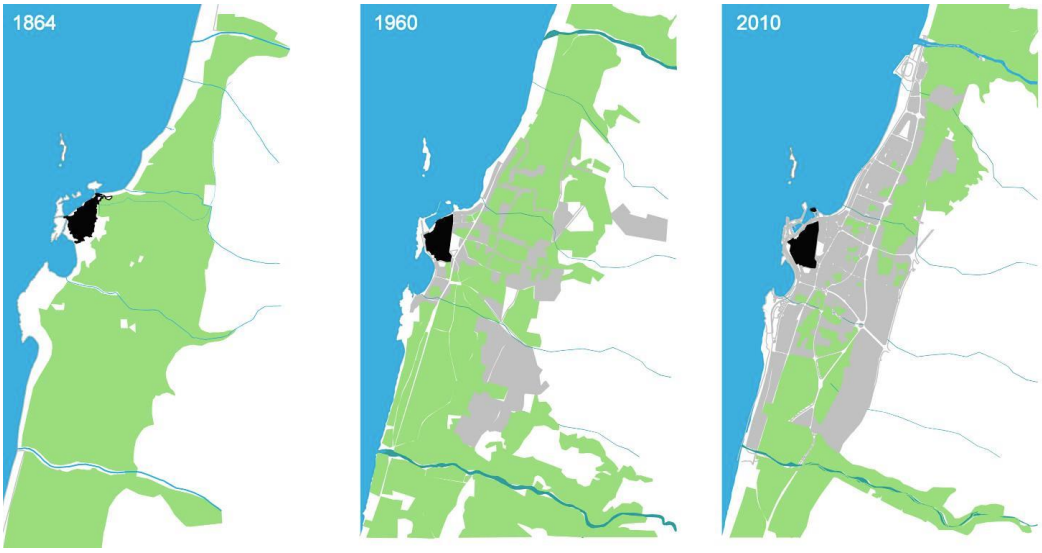


Figure 5: Evolution of agricultural lands. Source: Al Harithy et al, 2013, p: 17.

Consequently, it is important to question the effects of losing the most valuable city features; the features that define the city's identity and give its citizens pride; the features that also become part of the image of the city. Gradually, these are being inaccessible or are defined as "worthless" and are left to be sold as a commercial entity (Khalaf, 1998).

The city has no comprehensive plan, and is divided by multiple routes bisecting it from north to south stressing it as a bypass area. The liveliness in the city and the social and civic life are degraded and the existing natural resources are in risk. In 2014, the USUDS proposed a blue-green landscape network to protect the natural intrinsic values of the city and provide a pedestrian connected network throughout the city sphere. The proposal highlighted the agricultural lots, water streams, underutilized rail line and the shoreline within the strategy proposed. The strategic plan aimed not only to preserve natural features of the city, rather it aims for cultural, economic and social goals to be realized through this plan (Refer to figure 6&7). It thus rejected the concept of an enclosed park space and emphasized greenery connectivity that is based on the

city existing assets (Makhzoumi et al., 2014). Thus, this thesis further develops this network with focus on the underground channeled water streams, connecting the city expansions to the sea shoreline, and on the underutilized rail line in the city, connecting the water streams. It preserves the agricultural lots and the existing green spaces along them and proposes new ones. Accordingly, the purpose is to develop an urban design strategy to enhance physical and natural connectivity in the city through the water bodies and the railroad; developing a detailed urban design intervention at one of the city's water streams to propose a network of open spaces, and to explore the different possibilities.

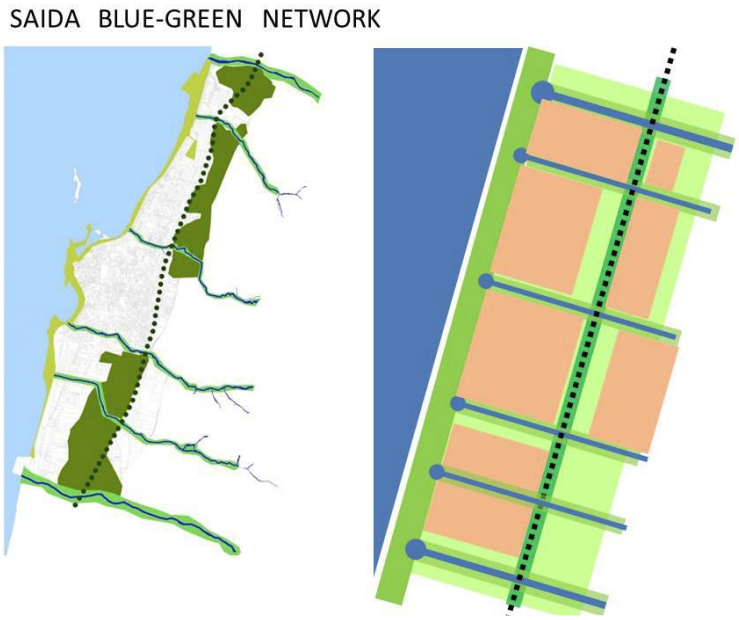


Figure 6: Saida, Blue- Green Network. Source: Makhzoumi et al., 2014.

TRANSVERSAL # 2	ENVIRONMENT HEALTH	SOCIO-ECONOMIC BENEFITS	LANDSCAPE HERITAGE	AMENITY, QUALITY LIVING
WATERCOURSES	INTEGRITY OF ECOCORRIDOR	TOURISM, IRRIGATION	NATURAL & CULTURAL	GREENWAYS
SEA/COASTLINE	ECOTONE MGT	FISHING, TOURISM	NATURAL & CULTURAL	WATERFRONT
AGRICULTURE	SUSTAINABLE/ ORGANIC	LIVELIHOODS, BRANDED MARKETING	CULTURAL, QANAYA	AGRI-TOURISM
GREEN/OPEN SPACES	SUSTAINABLE MANAGEMENT	QUALITY LIVING	ARCHAEOLOGY, CEMETERIES	GREEN-BLUE NETWORK

Figure 7: Saida, Blue- Green Network. Source: Makhzoumi et al., 2014.

CHAPTER II

LITERATURE REVIEW

This section of the thesis addresses the consequences of wide vehicular networks and unregulated city growth on urban and green spaces. It then proposes a framework to reconnect them as a tool to enhance connectivity. The consequences in this section is divided as follows: Loss of character and identity, loss of street life, loss of social cohesion, isolation, and loss of biodiversity.

A. Consequences of unregulated city expansion and vehicular dominance on the urban sphere

1. Loss of character and identity

The city physical setting marks its legibility or imageability in one's perception. A highly-connected city with interrelated distinctive entities provokes a strong mental image. If well designed, the city will increase space awareness and ease the movement with apparent directionality (Lynch, 1960: 9, 10). Today, each building is designed independently regardless of the space networks. It is planned without real consideration of the building-street relation (Trancik, 1986:1). The residual area formed after development is usually left un-designed. Modern cities undervalued the rich street life and the importance of public spaces in creating strong and connected urban setting. This formed an "unshaped antispace" (Trancik, 1986:7). To add, as traffic increases near residential areas, people are less likely to identify the area as home. (Appleyard &

Lintel, 1971). The dense vehicular movement negatively affects the space identity (Alexander et al., 1977:82) and degrades street activity.

2. Loss of Active Street Life

Jacobs defined traffic flow lines and car service areas as "powerful and insistent tools of city destruction" (Jacobs, 1961), influencing the whole exterior public environment (Trancik, 1986:35). Streets and plazas don't provide the ground for the traditional outdoor activities and don't present a satisfactory connected setting (Trancik, 1986). When the urban planner Peter Calthorpe (2011) asked people in China about different urban design alternatives, people always chose the one that regards human scale and street life. They felt that street activity loss is a problem in the city. Streets of today depress activity and the viable relation between the built structure and its adjacent space. We mainly have roads, not streets (Louis Kahn, quoted in PPS, 2016). Narrow sidewalks, disconnected paths hinder pedestrian activities and limits it to and from parking spaces (Hess, 1997). Besides, the construction of large malls and shopping centers degraded the commercial activities at the street level and the social and physical activity it provokes. As a result, the city presented an undesirable space for living (Trancik, 1986).

3. Loss of social cohesion

"People had withdrawn altogether from (the heavy traffic street), leaving it to the traffic" (Appleyard, 1981). It is evident that design can promote social cohesion (HM Government, 2009). Streets that are planned for slow speed traffic, minimum car parking and pleasant environmental conditions inspire community development, happiness and social relations. It offers improved, more intense community meetings

that are less affected by roads as separation lines (Sauter, et al., 2008). As Griefahn (2000) observed, residences facing congested streets tend to stay less in the house garden and have less guests if compared with residents living on less busy streets.

Another study showed that walkable, mixed used communities tend to enhance social relationships, build trust among neighbors, and increase political participation. People are then more likely to know each other (Leyden, 2003). Strong communal relationships tend to affect the residents' perception of their environment. In an Australian study on older women, where residents enjoyed intense and deep relations between each other, women described their neighborhood as "nice and livable". This might be the result of the safe and deep social cohesion (Walker and Hiller, 2007). It is proven that our social environment can deeply reflect on our sentiments and thus on the perception of the space (Hart, 2008). Streets that can accommodate pedestrian activities present the city most essential assets. However, streets are not being designed for pedestrians, they reflect the vehicular domination in today's cities (PPS et al., 3). Streets can offer rich public spaces and if improved can be the easiest way to improve the quality of life in the community (PPS et al., 5). Pedestrian friendly spaces are fundamental to community happiness (ENRIQUE PEÑALOSA cited by PPS et al., 19) bringing people together and reducing community isolation.

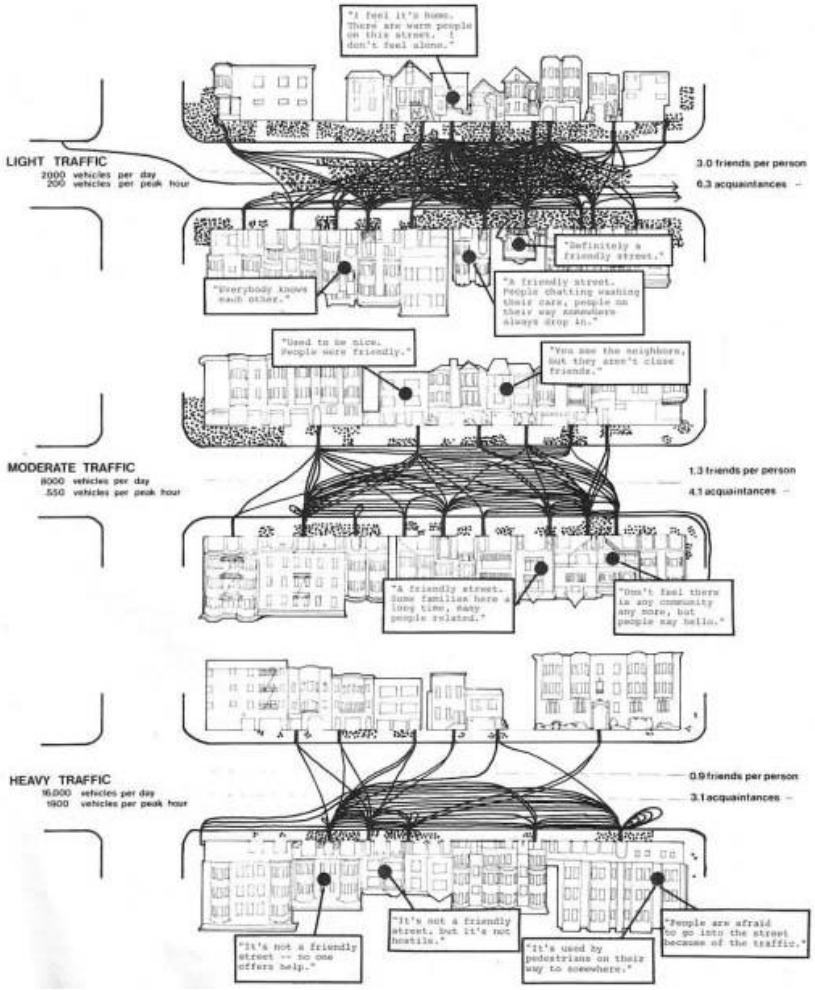


Figure 8: Effect of vehicular speed on social interaction (lines are a representation of social activity). Source: Appleyard, 1969.

4. Isolation

The highly car dependent streets increase segregation and create isolated communities. The highways separate buildings with large open spaces that don't make space for social activity (Trancik, 1986). Moreover, high car dependency modified internal roads into heavily used streets and hindered community interaction (Trancik, 1986). In a recent report from the city of New York, residents complained the effects of vehicular dominance in the city. It deteriorates air quality and increases levels of noise pollution. They also noted the risky street crossings and the sense of isolation from main public spaces (PPS et al., 11). In addition, the urban fabric in many cities fragments

green spaces and threatens its existence. Consequently, physical and natural aspects of isolation degrade the quality of life in the city.

5. Loss of Biodiversity

The unplanned unrestricted expansion of the city results in a gradual loss of formerly valued green areas and the decay of landscaped zones. Increase in population, city growth, and high reliance on automobiles results in more vehicular arteries and car density in the city, which in turn disrupt natural habitats and erode the natural system (Benedict &Mc Mahon, 2012). Roads present a main dividing entity to green spaces habitat (Forman et al., 2003). Isolated green spaces, even if preserved, are not sufficient for a viable ecosystem and functional biodiversity (Benedict & Mahon, 2012). As grey infrastructure need to be connected to have a well-functioning system, so are natural areas that act as a green infrastructure for the city. Olmsted noted that if green areas are to give all its benefits and flourish in an urban setting, then it must formulate a system (Coutts, 2016). In 1887, he designed the Emerald Necklace, a series of connected parks and green paths. In addition to the viable ecosystem services it offers, Olmsted stated that natural areas provide a sense of freedom, tranquility, and enhance aesthetics (Benedict &Mc Mahon, 2012). Multiple examples followed Olmsted plans in providing green networks in cities. Some US cities, among others, used this concept to naturally infiltrate runoff water while preserving the natural city identity and providing visual amenities such as Santa Monica in California, Alachua County in Florida, and Chicago in Illinois (EPA,2010).

If a city doesn't develop a green infrastructure network, green spaces will most likely be undervalued and be invaded by more development (Coutts, 2016). Green infrastructure (GI) is not a city luxury. It is a necessity for a healthy community

(Benedict &Mc Mahon, 2012). GI supports the natural, economic, and social functions for community wellbeing. In brief, it structures the “natural life-support system” (Benedict &Mc Mahon, 2012).

Consequently, cities of today are under the influence of many dynamics that degrade their sense of space, create detached districts, reduce street activity, and threaten their ecosystem. However, many factors could restructure the image of the city and shape successful places within the existing setting.

B. Enhancing Connectivity of the urban sphere

This section discusses the premises of vibrant connected urban spaces stressing that connectivity is an aspect that needs to be integrated in a set of other factors to present a successful place. Then the section highlights the principles of green infrastructure. It compares the two and deduce that the two themes interrelate and green infrastructure is proposed as a framework to shape better connected urban spaces.

The existing urban fabric and the extent it is planned and managed influence our daily contemplation or misery. They have foundational effect on community social cohesion, sense of safety, well-being, education, and harmony. They can help encourage investments and create jobs. In addition, the city structure plays a major role in providing a healthy diversified ecosystem with the increase threat of resource scarcity and pollution (HM Government, 2009).

Cities must act as a ground for everyone, and provide an attractive and inclusive environment. It must be sustainable and enjoyable. In a time of increased risk of extreme weather incidents and degraded ecosystems, cities must be designed to mitigate the effects of climate change, enhance biodiversity and preserve its natural assets.

Moreover, the obligation for a landscaped based approach is a tool to enhance cities livability and quality of life (HM Government, 2009).

1. Connectivity

Well-connected places and permeable places promote urban liveliness. Only few places can survive with isolation as they act as a main destination point. Well-connected spaces provide guidance through clear routes and enhance movement especially for pedestrians and cyclists. It provides attractive spaces and ease passage within different localities (Adams & Tiesdell, 2012). This acts as one of the main success factors for Circular Quay in Sydney. It connects two focal points in the city, Sydney Opera House and The Rocky (a historical site). In addition, Circular Quay is a main terminal for multiple transportation modes (ferries, buses, train) making it a central destination for city residents and tourists. Circular Quay also links multiple touristic sites offering a range of products alongside. It hosts numerous cafes, dining spaces and forms a welcoming space in the city (Placemaking, 2016).

Figure 9: Circular Quay. Source: Placemaking.com

However, enhancing pedestrian activity and connecting spaces must promote designs that are destined for people, mixed use, distinct, and sustainable. It is about the total sum of the space rather than the individual entities it presents, and the relationships people build with the area they stay in. It is a "place making activity" (Adams & Tiesdell, 2012). These space qualities are defined as follows:

First, places meant for people are attractive spaces that encourage communal presence and occupancy. They consider four points: activity, scale, safety and comfort. Activity is enhanced by diversified multi-scale settings which incorporate multiple age groups and social levels. A place that promotes conversations, includes rest areas to stop and sit and offers actions that integrate the street passengers. As for scale, the space must be oriented to serve pedestrians rather than automobiles. It calms vehicular speed to act in harmony with the street activity. It also increases the sense of safety. As the space is more crowded, people are more likely to feel safe in the environment. Lastly, it adds comfort, giving accessibility to places of rest and enjoyment regardless of age and disability (Adams & Tiesdell, 2012). Kungsträdgården or The King's Garden is a successful place in the heart of Stockholm presenting a central meeting space. It encompasses multiple restaurants and sitting areas. Kungsträdgården offers a stage for entertainment activities and exhibitions, and part of the park becomes an ice rank in winter. It is a highly-occupied space that portrays part of the city identity (PPS, 2007).

Figure 10: Kungsträdgården. Source: WordPress.com

Second, places of mixed use and varied density provide a range of benefits besides promoting space vitality. Having multiple uses within a walkable distance offer places for social interaction, minimize travel times and the use of transportation means. It aids businesses to thrive and presents a wide variety of choice for customers. Mixed use is a fine-grained scheme that can diminish the boundaries between the street and the building (Adams & Tiesdell, 2012). Times Square in NY offers a vibrant public space; it was transformed from a highly car dependent area into a primary pedestrian one where you can enjoy a pleasant shopping and entertainment experience. It presents a highly-defined space where you can sit, walk and enjoy the glowing façades promoting the liveliness in the city (Snohetta, 2016).

Figure 11: New Times Square. Source: Snohetta.com

Third, memorable spaces enhance physical activity (Nassar, 2015). The identity of space could be strengthened by celebrating the distinctive characters it acquires. A space rich in cultural or historic heritage can be reinterpreted through materials and activities. A derelict land or lost spaces can offer an opportunity for a new and remarkable contemporary space (Adams & Tiesdell, 2012). The high line in NY is a historic railroad that went out of service and was about to be demolished. The community fought to keep the structure in the city, and to redefine it as an accessible public space. The designer intended to use native NY plants to enforce its identity as part of the city structure (NYC Parks, 2016).

Figure 12: The High Line. Source: NYCParks.com

Fourth, sustainable urban design tends to reduce air pollution, decrease the dependence on limited fuel resources, and limit the "environmental footprint" of the built structures, among many others. It promotes walkability and cycling as tools of movement (Adams & Tiesdell, 2012). Old Mint Plaza in San Francisco presents a sustainable case study. It was closed to vehicular activity and urban meeting spaces were designed. The space was environmentally planned. Plantations soaked runoff, recharged ground water and enhanced air and water quality in a highly urban setting. The space shortly proved to be successful where cafes and restaurants speedily opened. The space holds public activities and performance while enhancing the environmental aspects for a more resilient space (Sarte, 2010).

Figure 13: Old Mint plaza. Source: www.cmgsite.com

The qualities of spaces, as explained above, provide the basis of well-defined and meaningful spaces, addressed for both today and tomorrow. These qualities could be fully integrated in a green infrastructure plan that offers an urban design approach to enhance connectivity and the quality of life in the city.

C. Urban design approach: Green Infrastructure as an too to enhance urban connectivity

Green infrastructure is an ecological framework based on two principal initiatives. The first is creating a series of connected green areas for the benefit of the community. Green infrastructure provides recreational places, aesthetic values and promote health. The Second is linking natural habitat, preserving intrinsic species and enhancing ecosystems processes (Benedict & Mc Mahon, 2012).

Green infrastructure endorses a landscape based approach that promote ecosystem preservation and public health enhancement. While public health covers a wide range of "biological, sociological, economic, environmental, cultural and political factors" (Tzoulas et al, 2007, p: 169).

1. Planning and design principles

This green approach entails the characteristics of successful spaces discussed above through its six main principles: Connectivity, Habitability, Multi-functionality, Identity, Resiliency, and Return on investments (Rouse et al., 2013).

a. Connectivity:

First, green infrastructure requires a well-connected network of vegetated spaces that are more beneficial than isolated green areas. For example, if parks and squares are linked in the urban development through trails, it could be used by a wider range of people if compared by an isolated park in a residential zone (Rouse et al, 2013).

High Point redevelopment project in Seattle incorporated 1600 residential units of different social classes. It formed a network of swales, ponds and multiple parks that served as water storage and as recreational spaces. 4500 linear meters of landscaped area were implemented as the longest natural drainage system in the city of Seattle. The street grid design ensured a safe pedestrian experience, connected natural drainage systems, and an upgraded water quality. The project enhanced the sense of place and the aesthetic value in a dense urban area (Johnson & Staeheli, 2016).

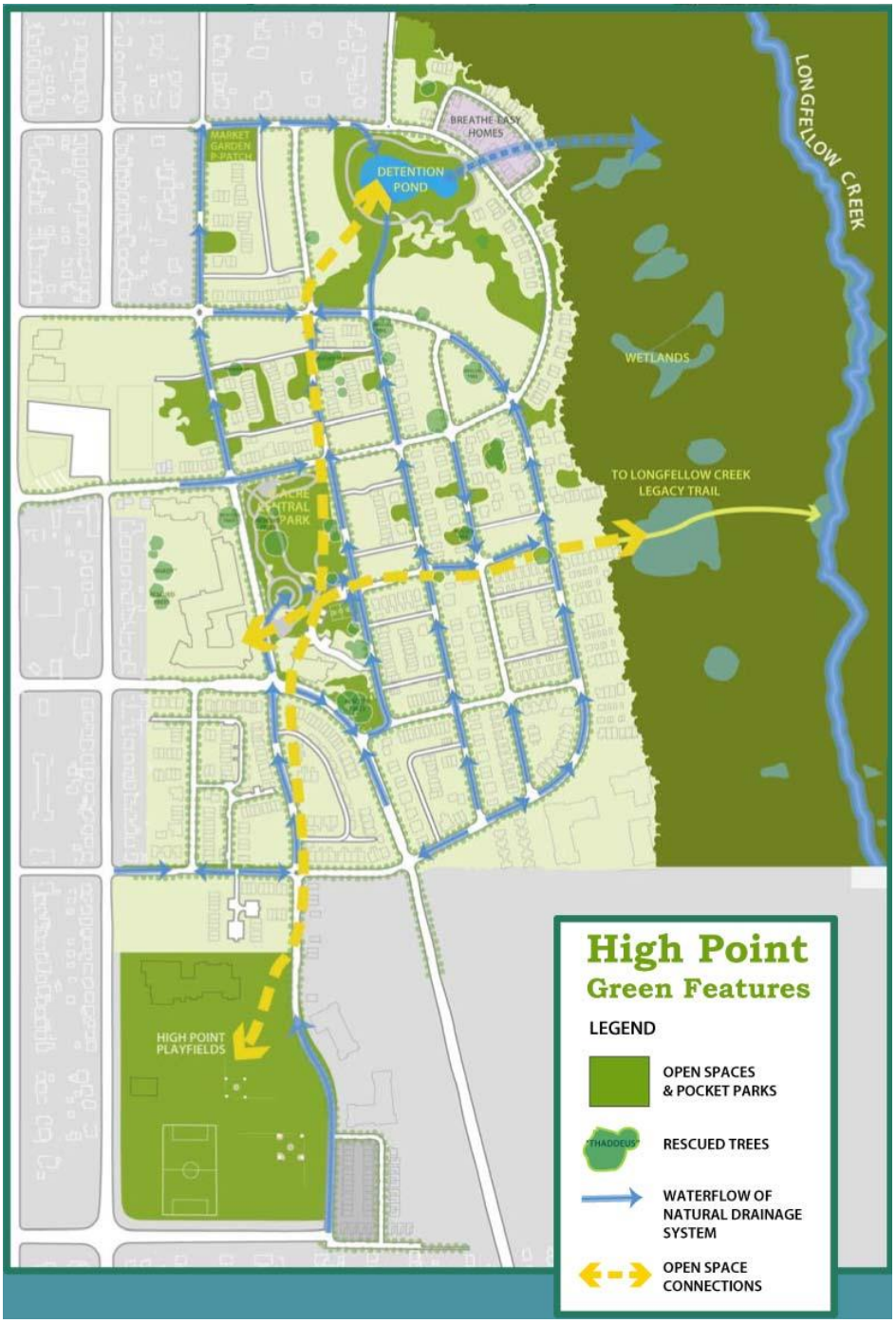


Figure 14: High Point green features. Source: Pedshed.com

b. Habitability:

Second, green infrastructure improves the habitability of the built environment. It purifies air and water, provides outdoor recreational spaces, and offers attractive settings that aid mental peace and encourages physical activity (Coutts, 2016). By

introducing shaded areas and calming traffic, green spaces enhance walkability, where the landscaped streets provide spaces for community gatherings, social interaction and promote connectivity. Moreover, green infrastructure provides habitat for flora and fauna and preserves natural features (Rouse et al, 2013).

SW Montgomery Green Street in Portland, is part of a green infrastructure. It introduces the street as a more welcoming space in the city. The “green street” connects West Hills to the Willamette River (ASLA, 2018). It is recognized for its innovative approach. In addition to storm water management and enhancing air quality, the street offers vibrant animated community spaces in ultra-urban fabric and propose various transportation modes giving priority to pedestrian and cyclists movements (ASLA, 2018).

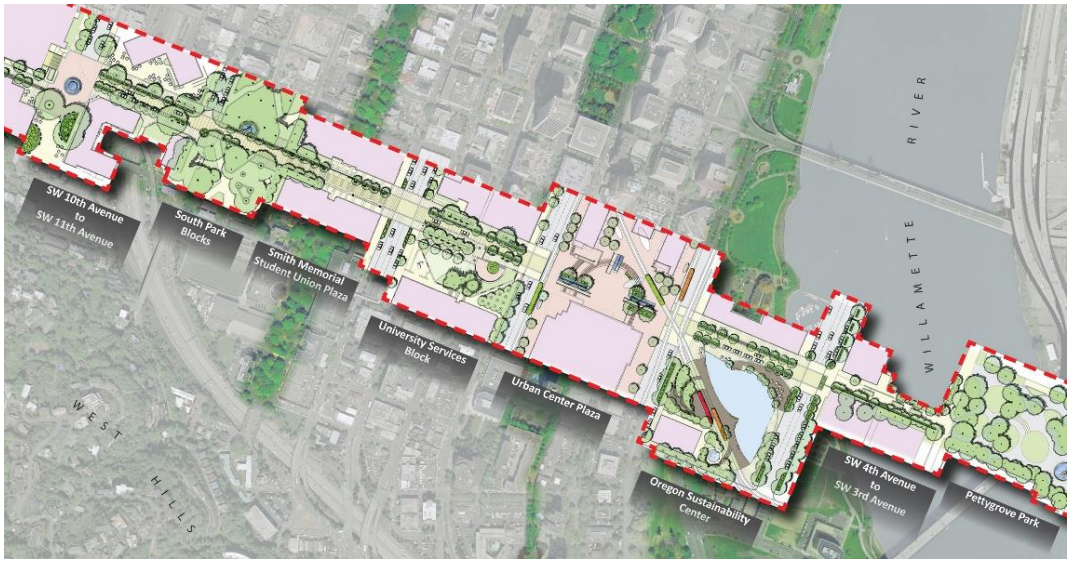


Figure 15: SW Montgomery Green Street plan. Source: ASLA.com

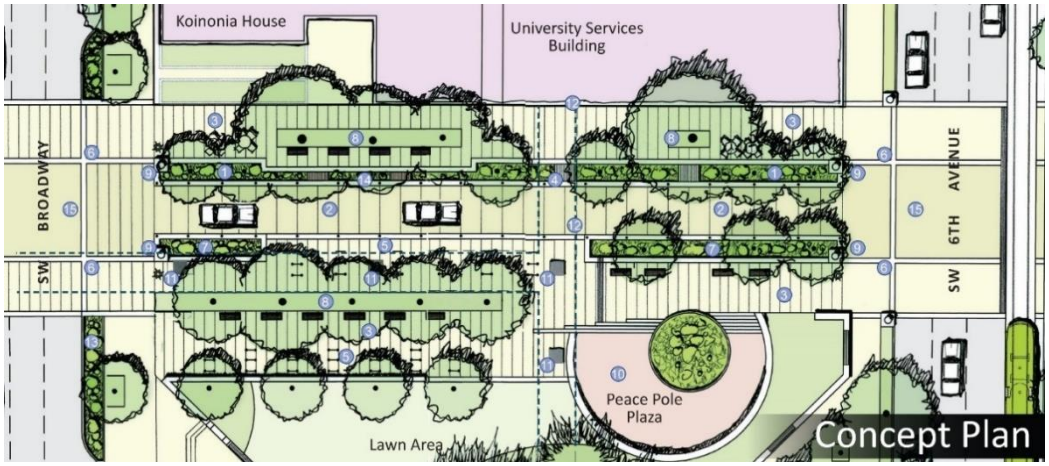


Figure 16: SW Montgomery Green Street concept plan. Source: ASLA.com

c. Multi-functionality:

Third, green infrastructure provides environmental, economic, and community benefits that are the base of the "triple bottom line" concept (Rouse et al, 2013). Through this model green infrastructure promotes spaces of mixed uses and diverse activities.

Examples could be:

i. Urban parks: Parks can host multiple recreational activities such as sports fields, amphitheaters, art exhibitions, water features, and ancient monuments (Rouse et al, 2013).

ii. Waterfronts: Community accessible open space along a water body can entail multiple cultural and recreational activities in a mixed-use site (Rouse et al, 2013).

iii. Plazas and Squares: Being part of the urban developments, it encompasses multiple events and activities. It is a place to relax, dine, play and enjoy the city. It hosts shows and concerts (Rouse et al, 2013).

iv. Boulevards-Reused train rails: A landscaped corridor can host motorways and pedestrian lines and connect focal green spaces (Rouse et al, 2013). It can offer spaces for social cohesion and relaxation if well planned and furnished.

v. Left over spaces: A vacant space is an opportunity to incorporate in a green infrastructure network. It can help provide leisure spaces and enhance the city aesthetics (Firehock, 2015)

vi. Revitalized river courses: River banks can act as a wildlife corridor, preserve water quality and provide social space for various activities. (Firehock, 2015).

Madrid Rio is an example of a vibrant waterfront. The project reclaims the Manzanares River banks as a public space after it was enclosed by automobiles for decades. The project erased the physical boundaries and barriers previously shaped by the motorways. The highly fragmented urban fabric along the waterfront was reunited through a smooth linkage between the different stations in the project. It provides safe and enjoyable spaces encompassing 54km of pedestrian passages and 30 km of cycling paths. The project offers new social opportunities and mix through connected and welcoming setting, enhancing the quality of life in the city. In addition, the project represents a fragment in an allied series of open spaces and natural areas along the Manzanares River, from the Sierra in the north to the agricultural lands at the south. The natural areas preserve the quality of the air and water previously affected by the high CO2 vehicular emissions. It thus offers a multifunctional open space promoting the quality of life in the city (Burgos et al., 2015).

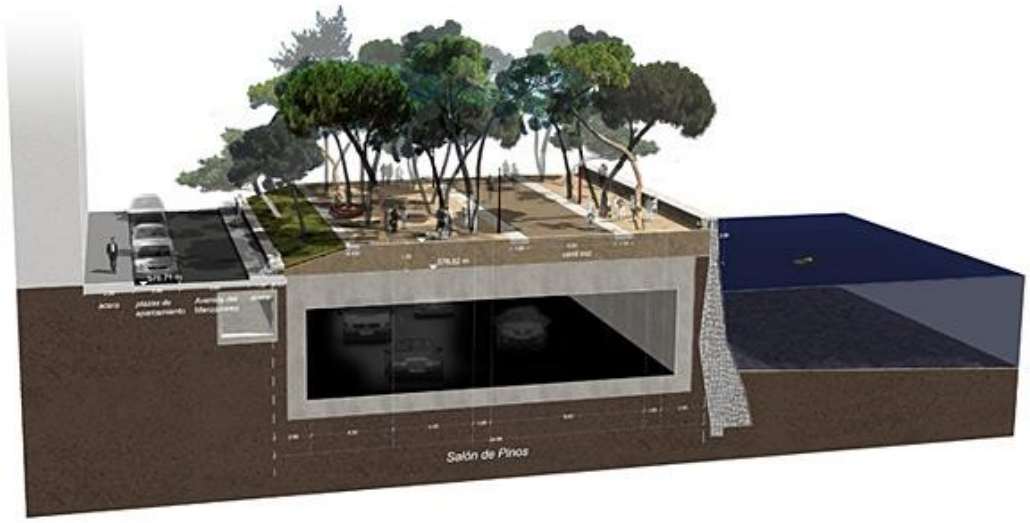


Figure 17: Madrid Rio. Section. Source: West 8.com

Figure 18: Madrid Rio Project. Source: West 8.com

d. Identity

Fourth, green infrastructure enhances space identity. It reflects the characteristics of place and the quality of living it offers. It blends natural and

engineered fabric that hold an imbedded symbolism of the community (Enache et al., 2013).

With the current emphasis on natural systems as a basic infrastructure, green infrastructure presents a vital tool to add value to community and to create attractive urban settings (Rouse et al, 2013). Local identity is highly related to spatial harmony, yet many existing urban landscapes may lack coherence and structure. Furthermore, spatial connectivity is essential for a memorable understandable and notable spaces. The landscape based approach can provide the linkage between different city identities, the contemporary and the traditional, highlighting the characteristics of each under a coherent framework (Enache et al., 2013).

Atlanta city demonstrates a good example. The city has a valuable urban forest which contributes to the city image. Through strict regulations the city preserves and enhances the natural features within. The restrictions ensure zero net loss in trees and maximum green areas preservation (Rouse et al, 2013). Furthermore, it protects wetlands through restricting adjacent developments and ensuring a riparian buffer zone (Rouse et al, 2013). Therefore, the legal greenery framework conserves the intrinsic values in the community.

e. Resiliency

Fifth, green infrastructure (GI) enhances community resiliency. Based on the concept that people and nature are interdependent (Alberti, 2004), framing a green infrastructure plan improves the resiliency of the urban developments. It decreases CO2 levels, manages storm water rate and volume, mitigates increased temperature, offers a buffer area to protect against increasing sea water levels, and provides wildlife

migration corridors (Abunnasr & Hamin, 2012). As green infrastructure supports a healthy biodiversity, it promotes resiliency (Peterson et al., 1998 cited by Alberti & Marzluff, 2004). Today, increased urbanization fragments ecological habitats and enhances their degradation (Alberti & Marzluff, 2004), though GI acts as a linkage for such areas.

Examples on green elements could be:

- Trees: provide shade, create microclimate, and mitigate heat island effect.
- Green roofs: reduce the need for cooling mechanisms in buildings.
- Natural drainage systems: reduce grey infrastructure costs and increase their capacity, such as rain gardens, permeable tiling, and wetlands (Rouse et al, 2013).

This is demonstrated through Seattle green infrastructure. Being one of the leading sustainable cities in the US, Seattle is implementing green storm infrastructure to reduce runoff water that is degrading its waterbodies and threatening the marine life. Seattle targets to implement GSI (Green Storm water infrastructure) at the maximum extent possible to protect human life, property, and nature from danger. The city set a well-crafted regulatory framework such as the stormwater code and the green factor, in addition to other financial incentives to widely implement the green strategy. The plan is based on a public private collaboration to attain a more resilient city (SPU, 2015).

f. Return on investments

Finally, while green infrastructure appears as a viable tool to enhance the community livability, it is important to consider the economic side for a feasible implementation. Green infrastructure offers multiple ways to generate financial returns

for both, the public and the private sectors. This could be through the resultant increase in property values, the decrease in grey infrastructure costs, and the reduction in resource dependent vehicles usage. A protected green area in Pennsylvania generated 240 million dollars from tax revenue on annual bases, increased the overall residential unit value by 16.3 billion dollars, and created nearly 6900 jobs. Moreover, it enhanced the community well- being, saving additional amounts of money (Rouse et al, 2013).

The demonstrated themes of green infrastructure are portrayed through three executed case studies. The projects support the theoretical framework and inform the design approach in Saida.

D. Case Studies

The case studies are recent urban design projects, some of which are still under implementation. The projects are fulfilling the themes of green infrastructure in an urban setting and integrating grey, green, and blue infrastructure to support a sustainable design approach. The projects provide a new vision for their urban environment crafting livable, healthier and better-connected communities.

While green infrastructure is hardly realized in the Middle East, the case studies are chosen from different settings. They are from diverse regions in the USA, from Oregon, Louisiana and Lexington. The projects are **SW Montgomery Street, Town Branch Commons, and Lafitte Greenway**. They vary in scale, context, and project goals. The three projects main clients are the public authorities and they are Portland Development Commission and Partners, Lexington Downtown Development Authority, and City of New Orleans respectively. This emphasizes the fact that a planning approach needs an effective government to be realized.

1. Projects Backgrounds

The case studies are revitalization projects that target different sections in the city. They hold a vision to enhance the urban space through different approaches. The first project focus on SW Montgomery Street which has been defined as a main pedestrian artery since 1988. Multiple efforts were held to improve the street scape. In 2006, a combined effort between the Portland Development Commission (PDC), Bureau of Environmental Services (BES) Portland State University (PSU), and Gerding Edlen Development, Inc. to create a green street and manage stormwater ensuring an environmentally friendly infrastructure and enhancing the street esthetics. The vision was to provide a primary pedestrian street and contribute to the city culture (Nevue Ngan Associates, 2009).

The second project, Town branch commons, is based on a historical creek trail, the project aims to revitalize a blue element in the city that passes through Lexington downtown and the surrounding rural communities. The water stream was buried under an existing road and it acted as part of the sewage system (SCAPE, 2018). Other than being a blue asset in the city, the creek is a historical pedestrian and bicycle path and a part of a waterfront. It has the potential to upgrade the economic status of the area (Town Branch Tiger, 2018).

The third project, The Lafitte Corridor, is a proposed greenway that served for decades as a rail road to transport merchant goods. It is a 3.1-mile-long underutilized public space linking multiple neighborhoods to the center of the French Quarter, the downtown. The railroad is a mixed-use corridor that holds residence, retail, and industry presenting a rich diversity of land use. The multiplicity of settlement patterns along the corridor represents different eras of development ranging from 200 years ago till the

date. It holds multiple socioeconomic conditions which presents a challenge of integration within any new vision set for the corridor. The main transformation catalyst for the green corridor project is the 2005 Katrina Hurricane. Many projects were issued to decrease the impacts of the tragedy on the affected communities (ASLA, 2018). So, the three revitalization projects target a main street in a city, a trail creek, and an underutilized railway, each of which relate to parts of the proposed blue-green network in Saida.

2. Projects goals

The projects goals vary according to the scale of the project, this reflects on the level of details presented in each approach.

The SW Montgomery Street aims to achieve many goals including:

- Build on the country reputation as a place for innovative green strategies and designs.
- Provide a model for a green street through managing stormwater to enhance street livability.
- Connect green and cultural facilities to the urban business districts within a walking distance and link it to the larger context through different transit modes.
- Enhance the relationship between city residents and university students.
- Present the street as a research lab for university students and simplify the themes of sustainability to city residents and passersby through an executed project.
- Activate the whole street through its active central plaza.

- Promote the street as an eco-zone that connects the overall area (ASLA, 2018).

While the goals of the first project are mainly to link and activate the street through a green approach, the two other projects consider connectivity yet, at a larger scale. They aim to connect multiple neighborhoods along a green walkway. The Town Branch Commons goes beyond merely daylighting the water stream. It aims to revitalize the area, craft vibrant spaces, provide pedestrian-friendly zones, and create a series of connections. First, the project connects the city to its historical blue and green identity. Second, it connects the city existing urban core with the emerging neighborhoods and the surrounding rural communities. Third, it creates a linear green network of open spaces connecting existing and proposed parks (SCAPE, 2018).

When completed the connected network will foster the role of the urban core and facilitate residents' linkage to their businesses and to recreational facilities. It will also increase lot prices along the trail and attract new developments. The quality of life in the area will improve with access to more than 2000 acres of parks and open spaces and improved economic cycle (Lexington-Fayette Urban County Government, 2016).

The last project, the Lafitte green corridor, presents an opportunity to unite the surrounding neighborhoods through activated public spaces after its historical position as a dividing entity within the urban fabric. The revitalization project respect the historical value of the place. It integrates a water feature for it passes next to a water canal, and the existing green features along the railroad. It creates a weaved linkage for the city assets (ASLA, 2018). The goals in this project are centered on four main headings: Environment, community, art and economy and are "Specific, Measurable,

Action-oriented, Realistic and Time-based (SMART)" goals to evaluate the project success.

The Lafitte corridor presents a new vision for the area through a connected and accessible public space that holds multiple recreational facilities to ensure a better life quality in New Orleans (Design workshop, 2013).

All of the three projects are based on the theme of connectivity, they relate the success of the projects to the degree of connections created. The projects link the urban fabric through the existing and proposed natural city assets.

3. Planning tools utilized

The SW Montgomery Street is a single project. The planning tools utilized are precise and cover a range of specific aspects. The other two examples are a combination of multiple projects joint through a strategic vision with general planning means. As for the SW Montgomery Street, the planning tools are:

- Craft wide sidewalks with curb-less edges and place different street furniture facing retail spaces.
- Limit vehicular movement. The street that accept vehicular usage will hold only one lane for movement and another for parking with an opportunity to close the auto lane for pedestrian activity on special occasions.
- Craft a continuous storm water vegetation strip to visually connect the multiple blocks throughout the street.
- Integrate green wall and green roof in future projects along the street.
- Respect the character of the street when adding green elements.
- Use water as a unifying feature that enhance the identity of the SW Montgomery Street and create gathering places around (Nevue Ngan Associates, 2009).

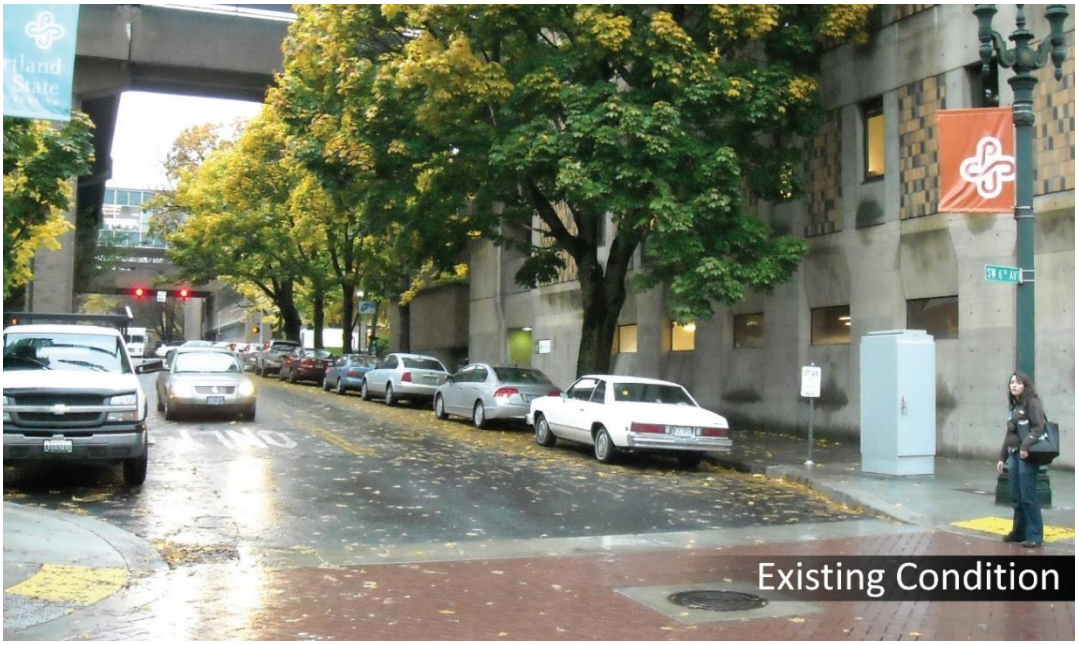


Figure 19: Existing condition at University Service Block, part of the SW Montgomery Street. Source: ASLA.com

Figure 20: Proposed design at University Service Block, part of the SW Montgomery Street. Source: ASLA.com.

The second example, Town Branch commons, is a series of projects that can be categorized into three main headings: Introduce the Town Branch Park, enhance existing public space, and create connections.

The Town Branch is a designed park that will act as the central space in the spine. It is aimed as a primary destination to fit all types of users (Town Branch Common org., 2018). To add, the project entails five existing parks. To improve these public spaces small and short-term projects will be executed to test innovative ideas and activate and highlight these areas (Town Branch Common org., 2018).

Moreover, to ensure connectivity, the Town Branch Commons proposes two main bike lanes that link the project and provide a sustainable mode of transportation along 2.5 miles. The planned lanes link two existing trials to create an uninterrupted path of 22 miles connecting two existing trials, the Legacy Trail and Town Branch Trail. It also provides a connected pedestrian experience and a wider shade canopy. The streetscape will be improved through lighting fixtures, resting spaces, and numerous signs and crossing enhancements to ensure pedestrian safety (Lexington-Fayette Urban County Government, 2016). A vegetated strip will be added or enlarged to offer a buffer zone separating different modes of transportation and ensuring a safe walking and riding experience. It will also act as a natural system to infiltrate rain water and recharge underground water. The project thus aims to create complete streets utilizing parking lots and right of way and incorporating existing green and blue assets in the city (Lexington-Fayette Urban County Government, 2016).

The Town Branch Commons is scalable project, where parts of it can be implemented in a separate manner, yet the connectivity of the project is lost if the vision is not fully realized (Lexington-Fayette Urban County Government, 2016).

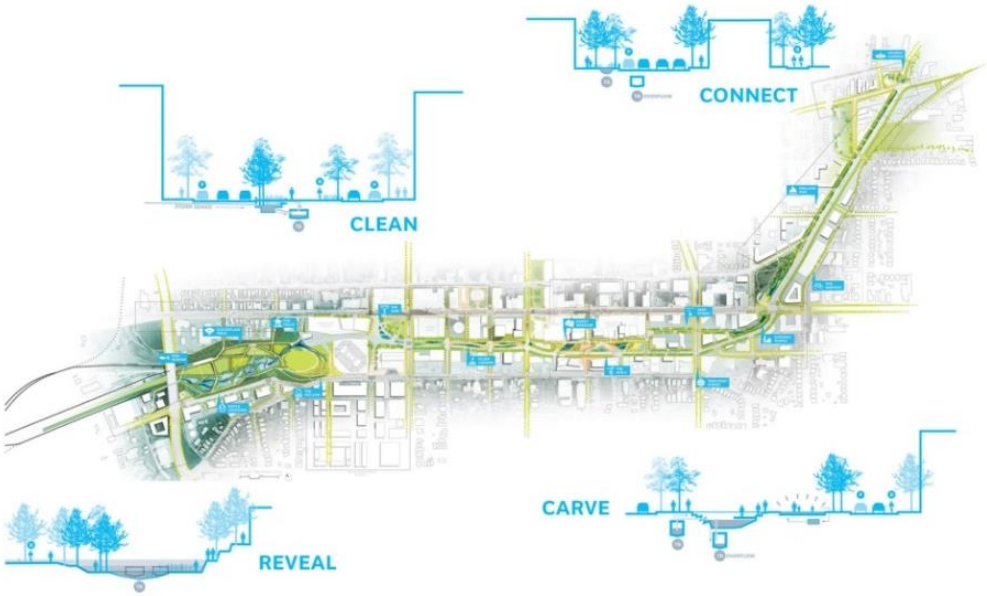


Figure 21: Town Branch Commons water concept. Source: scapestudio.com

Figure 22: Vine Street: Before and After. Source: scapestudio.com

The third case study, The Lafitte corridor, links four zones which are an industrial zone, a historical canal, urban residential communities, and the downtown. The planning scheme respects and integrates each zone character and location. It is a public-private collaborative approach. The community is engaged throughout the whole project phases through multiple workshops. The latter proposed the possible public spaces activities and programs.

The Lafitte corridor builds upon green infrastructure as a thematic connecting entity throughout the project. It incorporates native plantation respecting the site identity. Rain gardens and bio swales are proposed to manage and purify rain water. By thus, wild life habitat is enhanced and the effect of global warming is reduced. To add, the high levels of rainwater in the area caused flooding problems, carved spaces are created to act as water reservoirs and a shared public space.

The project ensures adequate seating, lighting, leisure facilities, and a green buffer to reduce noise and light pollution (Design workshop, 2013). It also ensures a multi model transportation arteries to enhance walking and bicycling. It also presents and supports public art work displays. The historic canal, as an example, is part of the green corridor and holds opportunities for art work display about the history and ecology of the place. The Lafitte corridor creates various meeting spaces along the water path.

The project tried to abide to a low budget plan, with a return on investment opportunities scheme (Design workshop, 2013). One of which, promoting the trial as a touristic destination through programed trips, signage facilities, and advertisement campaigns.

To ensure a full revitalization project other parallel plans are incorporated:

- Benefit from existing central projects as a catalyst for the area.
- Encourage private investments through low interest or zero loans.
- Improve the neighborhood districts. This could be through better management and enhanced facades (Design workshop, 2013).

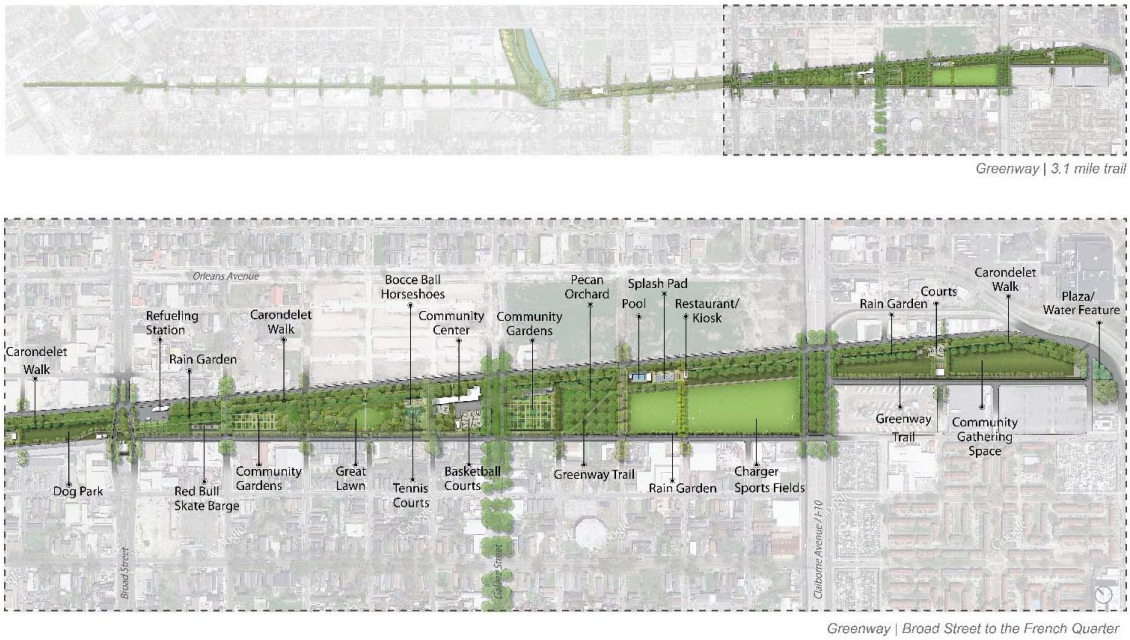


Figure 23: Lafitte Greenway links multiple open spaces and integrates the urban fabric in a distinct greenway design. Source: Design Workshop, 2013

Figure 24: Part of the historical canal is envisioned as a recreational space along the Lafitte greenway. Source: Design Workshop, 2013.

The three projects aim to revitalize the chosen zones based on their existing assets respecting the area character, history, and natural features. Through adopting sustainable planning tools, the projects not only aim to craft livable communities, they also aspire to enhance the economic status of the areas where needed.

4. Awards

The projects are chosen for they are well known for their success and have received awards from reputable parties. The SW Montgomery Street had received the 2012 ASLA professional award (ASLA, 2018). The Town Branch Commons design scheme won the Town Branch Commons competition in 2013 (SCAPE, 2018). The Lafitte green corridor received 2013 ASLA professional excellence award (ASLA, 2018).

5. Lessons Learned

The projects highlight green infrastructure as a main tool in the revitalization model. The greenery proposed is not merely an aesthetic element added. It holds a variety of benefits to the environment and the community enhancing the quality of life in the area as a whole. The projects result in healthier communities through increased vegetation and sustainable transportation modes. It presents the green and blue assets as tools to generate revenue and ensure better economic status in the targeted area.

The SW Montgomery Street rejects the street as merely a tool for vehicular movement. It crafts the latter as a space to gather, enjoy and rest. It is a place to extend business for outdoor seating space and host events and city activities. Also, the street hosts natural habitat and infiltrates rain water (Nevue Ngan Associates, 2009). It is an evident that we can craft livable spaces and introduce sustainable tools in a dense urban fabric.

The second project, the Town Branch Commons, holds the vision of a green corridor along a historical water path. While it crafted a natural blue environment where possible, it held its traces through a green path where it is still buried underground. As the case of SW Montgomery Street, the project suggests a complete street in the urban areas that suffer from congested streets and high pollutant emissions. The plan ensures the possibility of improving the urban city sphere through green infrastructure.

While the third project also suggests a green walkway, the main project catalyst is to uplift the zone economic status and reactivate a deteriorated area. The community engagement in this project presents a valuable informative tool to better understand people needs and prospects to offer the city scape they aspire for.

All of the three projects inform the design approach and assist in building the project vision in Saida. They support in developing urban design principles based on the themes of green infrastructure (Refer to figure 25). Some of these principles are:

a. Create a vision for the project and set measurable goals to evaluate the project success.
b. Suggest programs and attraction nodes to activate the project
c. Test pilot projects and adjust according to the feedback
d. Value city assets and weave it through linkages to enhance their livability.
e. Connect natural areas and people walkways. Connectivity is a main theme to provide healthy ecosystem. It is also a priority for pedestrian and bicycle paths. By providing linkages people are more likely to walk and ride a bicycle.
f. Ensure bicycle riders and pedestrians with needed facilities. Upgrade streetscape through furniture, greenery, lighting, and signs to ensure pedestrian comfort and safety.
g. Utilize derelict spaces in the city as part of a green infrastructure strategy.
h. Utilize parking spaces and right of way where possible as part of the community public space.
i. Prioritize pedestrians where possible

Figure 25: Planning tools based on the themes of GI and Successful Places

In brief, green infrastructure can render vibrant spaces, connect city fabric, and offer rich city experience. It is a guiding framework that can control growth in the city and enhance the quality of living, while preserving the natural features even in a dense urban setting. In this context, the thesis aims to explore the application GI to reconnect the neglected yet valuable green and water features and provide open spaces in the city of Saida (Refer to figure 25).

Green infrastructure (GI) could be developed along the blue- green network proposed by the USUDS, linking city parts through its watercourses and derelict railway. It thus links open spaces in the city and enhances the visual and physical connection with its waterfront. These spaces can be activated through GI multi-functionality aspect while preserving the natural identity in the city. This network can also perform as a natural drainage system that aid replenishing ground water reservoirs and enhancing water quality in the city. It is a holistic approach that can highlight the city character and provide a better and more resilient space for living.

CHAPTER III

Research Methods

The thesis research methods stem from the research question and from the analyzed case studies. It is composed of the following steps:

A. Historical analysis of the development of Saida

Analysis of previous plans, aerial images, regulations, zoning plans, and executed projects is done to assess the degree of connectivity of the city inner fabric and its relation with its surrounding landscape. This section allows an in-depth understanding of this process.

B. Analysis of current trends of development

The purpose of this step is to understand current trends of development in line with the historical analysis. This step will provide an in-depth understanding of the data that will support the development of the USUDS strategy. An analysis of city wide loss of connectivity is conducted to understand the extent that zoning and vehicular roads have impacted connectivity within the city and along arteries towards the surrounding landscape. To achieve this step, data is gathered from Saida municipality, google earth, personal surveys, and legislative forms. The following spatial data is mapped and analyzed at the full city scale:

a. Topography lines

b. The city focal and attraction points

c. Public transportation lines

d. Vacant and parking spaces

e. Main Sidewalks

f. City zoning scheme

g. Road Hierarchy

A map is developed to display different character zones in the city

C. Development of the city scale blue-green network strategy proposed by USUDS

The purpose of this step is to develop the strategy set by USUDS along the water streams and the rail line and to go beyond general guide lines to assess its applicability and to select a detailed intervention area. The following sub-steps are carried out:

a. Collect, map and analyze the following spatial base information:

   i. Mapping urban fabric through figure ground map and sections to analyze the extent of development along the railway and water streams
   ii. Mapping land use to detect Cultural, educational buildings, Commercial centers, Agricultural lots, vacant lots, parking spaces along the railway and water streams
   iii. Mapping green areas, derelict areas, and possible intervention areas
   iv. Mapping river and rail road encroachments.

b. Develop a map for opportunities and constrains along the blue-green network.

c. Develop a master plan of the green-blue network at the city scale setting types of strategies and intervention focus.

The aim of this step is to:

i. Build on the city assets to propose a network of open spaces based on identified underutilized and derelict areas.
ii. Preserve and highlight the city unique ecology.
iii. Connect the unregulated growth of the city.
iv. Stimulate lines of connection for a sustainable economic growth of the city
v. Enhance the historic value of the city. Greenways have been used for heritage conservation as well as ecological and recreation.

D. Green-Blue network prototype proposal

Based on the selected intervention prototype area, the following sub-steps are developed to propose a detailed urban design scale intervention:

d. Derive design principles through case Study analysis: Three case studies are analyzed using a template of common criteria to develop urban design guidelines that inform the design at the intervention area.

e. Analyze Resident surveys: An online questionnaire is conducted. The questionnaire targets at least 40 persons of whom have been living or working in the city for more than one year. The questionnaire is sent arbitrary for people of different age groups, gender, and educational background. It aims to better realize the residents' awareness about their city assets and to understand their prospects for Saida. The questionnaire analysis will enrich the design program

with the residents' viewpoints and assist in developing the overall program. In addition, the questionnaire will help in assessing the extent of disconnectivity of neighborhoods through questions that address mobility modes and the effect of vehicular arteries on the city sphere.

f. Collect and analyze spatial data: develop the following layers at the site scale to assist in the development of the urban design proposal. The data layers are conducted along the defined proposal area:

i. Mapping land use
ii. Mapping attraction nodes
iii. Mapping road hierarchy
iv. Mapping site character zones
v. Mapping zoning layout
vi. Mapping Permeability and accessibility
vii. Mapping opportunities and constrains
viii. Mapping existing case

The intervention area aims to:

- Create a multi-functional ecological network to attract different types of users throughout the year.
- Create safe and easily accessible spaces for diverse activities
- Decrease the visual, social and physical breaks created by the transportation network

g. Urban Design Proposal: Propose a design intervention; based on the spatial and collected data and on the interview results to address the named connectivity issues. The proposal includes the following drawings:

i. Demonstrative strategy map highlighting the design guiding tools.

ii. Layout Plan: Rendered proposal scheme if to be realized

iii. Sections: Five street sections at different intervals

E. Proposal Assessment:

The proposal is assessed on the degree to which it was able to integrate the following criteria:

a. Access and connectivity: Provide safe, accessible, and connected pedestrian circulation to different age groups along the intervention site with careful integration to vehicular movements.

b. Design quality:

i. Provide a high quality urban design space for people to enjoy through carefully designing building street relationship.

ii. Respond to the city fabric and grain through the proposed buildings and open spaces. Respect the scale, proportion, and the context of the intervention site.

iii. Propose the land use to accommodate variety of uses such as retail, business, and housing. It should be planned to work together and attract different types of users.

c. Sense of place: Respond to city character through design features that reflect the local identity and highlight the distinctiveness of special sites and landmarks.

d. Public space: Enhance the street activity and community gatherings by providing properly defined open spaces that enhance movement and flexibility of use.

e. Green Space: Introduce visually continuous landscape to connect the urban fabric using thematic greenery.

CHAPTER IV

STUDY AREA ANALYSIS

A. Connectivity over Time

The history of the city was tracked from the 1873 till the date, passing through the Ottoman Empire, the French mandate and the independence. The aim of this data collection is to better understand the city layers, patterns of urbanization, drive movements and their influences on connectivity in Saida.

In the 19th century, Saida was a walled city depending on her deep relation with the sea for trade and fishing. In the 20th century, the city witnessed multiple planning schemes following different planning eras. It was first planned by the French architect and planner Michael Eco chard in the mid of the 20th century. Based on modernist movements, Eco chard planned vast vehicular network to connect the old center with a new modern center that he proposed. Eco chard used vehicular connectivity to link the city with its hinterland, the capital and the country. The scheme, not executed, yet became a main reference point in the city for a long period of time (Ghorayeb, 1995). The adjusted and implemented masterplan was a blanket zoning that had no respect to the city natural resources or site features. In 2014, following sustainability theme, the USUDS report focused on the blue-green network to highlight derelict city natural assets and the need to consider an environmental approach. However, the scheme was not implemented and the city zoning is still the base point for any construction process. Up to date the city is controlled by land owners' interests and market speculation with no vision that organizes the urban developments of the city.

Through overviewing the historical evolution of the city, major events are identified to highlight the relation between the city inner fabric and its surroundings considering connectivity at multiple dimensions.

1. 1873- The construction of the first road outside the walls of the city

Residents lived inside the ancient gated walls. As the number of population increased, and the vacant lands became scarce, residents started moving outside the old city to find a new place for living (Kalash, 2001). The city main connection with other areas was through the port facing the old city, holding a historical relation between the city and its Sea. It wasn't until **1873** that the residents of Saida constructed *Al Shakreye Road* at the eastern edge of the old city (Kalash, 2001). The Road that later became a live commercial strip outside the old city (Al Nashra, 2015). It linked the Sea Castle to the Land Castle, connecting the old city to the new urban extensions. It was later developed as a transport station for different destinations such as "Saida-Beirut", "Saida-Palestine", and "Saida-Syria" (Al Nashra, 2015).

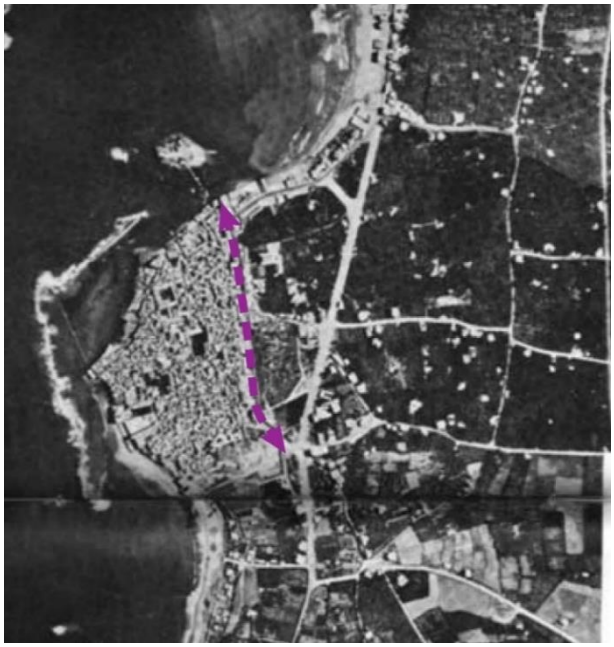


Figure 26: Saida Aerial Photo 1916 (Al Shakreye Road highlighted). Retrieved from Saida Municipality, 2017

2. 1942- The railroad connecting Saida with the country and the region

The history of the railroad in Lebanon goes back to **1895**, where the first rail road was established during the Ottoman Empire. It connected Beirut to Damascus in a 147 Km journey. In **1906**, a track was added to connect Rayak to Aleppo passing through Homs and Hama. Thus, providing access to Istanbul and Ankara through Aleppo station. The ottomans wanted to provide a network to link their empire. The third track was added in **1911**. It linked Tripoli to Homs. The railroad was not planned to transport civilians only. It had political and military purposes. During the Second World War, the last track was built between Tripoli and Haifa along the coastal line passing through **Saida** (Refer to Figure 27). It was intended to provide transportation for the British military forces and their equipment. While the Germans saw it as a way to link Europe to North Africa through the Middle East connecting their empire to be (Speetjens, 1998 as cited by Al Mashriq.com).

In **1948**, Arab- Israeli war ended with the foundation of Israel state on the Arab land. The year was later called "*Al Nakba*", *the crisis*. The relationships between Lebanon and the occupied state were ended and the railroad was activated within the Lebanese territories only. The Tripoli-Haifa line stopped at the Nakkoura, South Lebanon (Hughes, 1981 as cited by Al Mashriq).

The rail line hasn't been functional for a long time in Lebanon. During the first two years of the civil war it faced mass destruction (Speetjens, 1998 as cited by Al Mashriq). However, till the day, the rail line land is owned by the Ministry of Transportation, and the traces of the rail line are still present. It is an underutilized public space, with no other public transportation network is realized in Lebanon.

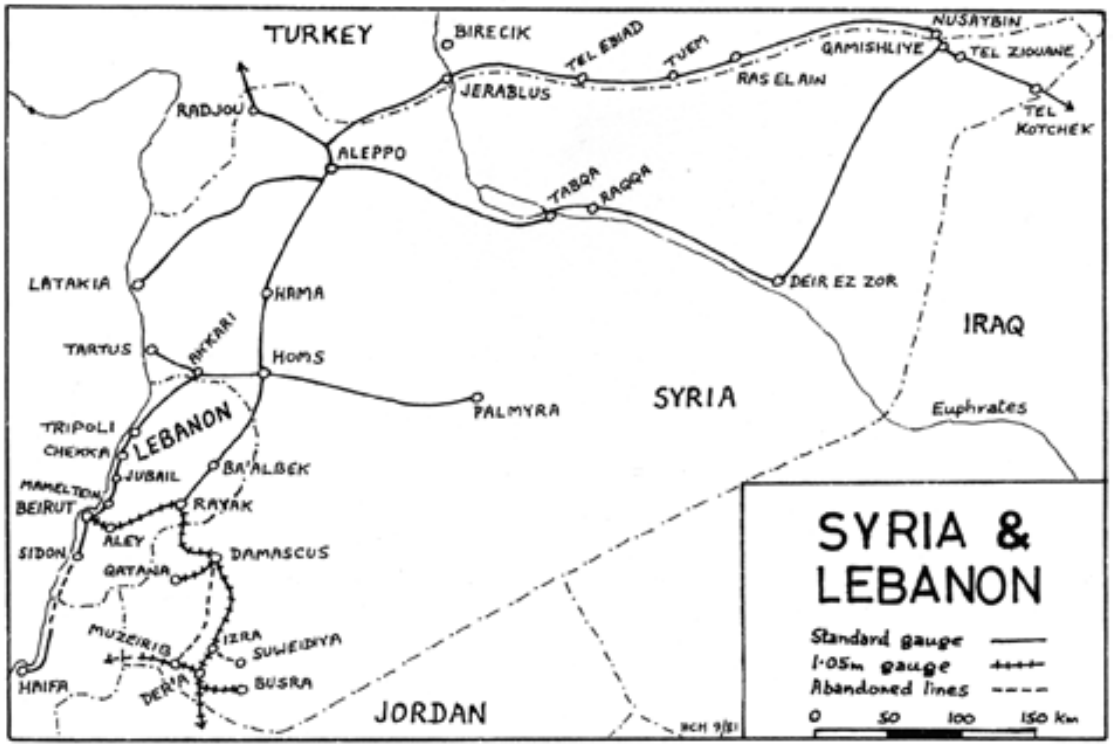


Figure 27: Rail line track. Source: Hughes, 1981 as cited by Al Mashriq.com

3. 1948 Establishment of Ein El Hilweh Camp, a highly dense gated community in the city.

In **1948,** Ain El Hilweh camp was initiated to provide shelter for the Palestinian refugees fleeing the Israeli invasion to their country. Saida alone hosted 100,000 refugees (design studio at AUB, spring 2013). The camp, located at the South-East of Saida, was a cluster of tents established by the International Committee of the Red Cross. It wasn't until 1952 that the tents started to be substituted by built up units (UNRWA, 2017). In 1967, additional 67,000 refugees joined the camp (design studio at AUB, spring 2013). However, the camp was bombed in 1982 by the Israeli forces. More than 70% of the camp was destroyed (Saleh, 2017). Afterward, the camp footprint gradually increased to become the **largest camp in the country**, in its number of population and in its total area (UNRWA, 2017). During the civil war, many refugees

were displaced from their camps and resided in Ain El Hilweh Camp. It is now called by the Palestinians in the city, *"The diaspora capital", "Asemat al Shatat".*

The Lebanese government has no official forces within the limits of the camp. It is headed by multiple forces within the Palestinian community. One of the most recognized is "*Fatah*", the Arabic also known as the Palestine Liberation Organization (PLO). The Lebanese soldiers guard the entry points of the camp and the limits are defined by steel wires and concrete bars. Many from the *"wanted list*" flee to the camp where beyond the reach of the Lebanese government.

Palestinians living in the camp are mainly daily workers in construction sites and orchards. At an early age, many Palestinians are forced to leave their schools to support their families (UNRWA, 2017). Living on low wages, many Palestinians can't afford to leave the camp. They gradually build their homes. As the family extends more floors are added without any legal framework or formal constrains. The camp is densely built where many houses don't receive adequate ventilation or sunlight and are in poor conditions.

The case makes the camp a security zone in the city of Saida with no stable security situation. This negatively affected the municipalities at the borders of the camp, Saida as the main one. This also hinders many projects around the camp.

Figure 28: Ain El Hilweh Camp in the 60s. Source: Lilmadina Initiative, Facebook page.

4. 1950- Riad Al Soloh road facilitating north-south vehicular connectivity. The city started expanding into the agricultural fields

Riad Al Soloh Street, was constructed during the mandate of the Prime Minister Riad AL Soloh. It was the only road that links Beirut to the South. The road became a dynamic commercial street in Saida (Kalash, 2001).

Figure 29: Riad Al Soloh Street in the 60s and now. Source: Saida between the past and the present صيدا بين الماضي والحاضر Facebook page.

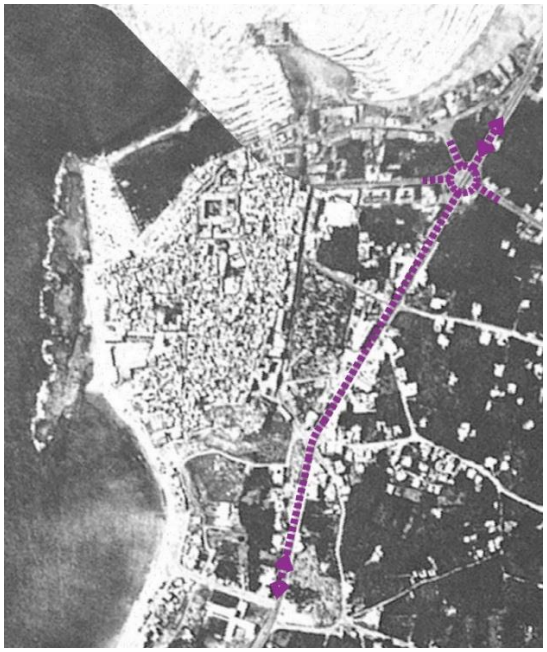


Figure 30: Riad Al Soloh Street highlighted in the map of old Saida.

Thus, the city started expanding outside the limits of the old city. Many city residents started moving to Dekerman and Wastani (Kalash, 2001), and multiple projects were executed. Along the coastal line, the Saidon hotel and the municipal playground were constructed at the northern entry point of the city (Kalash, 2001).

Figure 31: Saida municipal stadium. Source: Saidagate.com

5. ***1954- Issuing the legislative 11/1954 defining the administrative boundaries of the city***

The city was defined by three administrative zones. They were named as follow: The Old City, Al Dekerman, Al Wastani (Kadflash, 11). The limit between Wastani and Dekerman Zones is Al Qamla water stream.

Figure 32: Saida Administrative Boundary

6. ***1956-58 & 1962- Michael Eco chard Planning Saida***

Before Eco chard (1905-1985) practice in Lebanon, the country had no planning agency to regulate the built-up environment. Eco chard is a French architect and planner who worked on several sites in the third word such as Syria and Morocco. Eco

chard was influenced by Le Corbusier and his work reflected functionalism in the modernism era in the post-colonial countries. His proposed urban layouts created spatial areas according to function (work, leisure, residence with wide vehicular arteries...) (Verdeil, 2012).

His work had a great influence on the tools and ways of thinking in the planning field. He was the mentor for many Lebanese planners, some of whom he trained personally (Verdeil, 2012). Even though most of his plans were not executed, it remained the oldest and main reference for the new developments in the city for a long time (Ghorayeb, 1995). Eco chard plans were consistently faced by the bourgeois class and the political elites who saw that the results of these plans didn't embrace their interests and were not in their favor (Verdeil, 2012).

Between mid of 1950's and 1968 Ecochard was assigned to propose a master plan for Damascus, Beirut, and Saida in addition to other missions. The earthquake that hit Lebanon in 1956 destroyed about seven hundred houses in the old city of Saida (Al Kalash, 2001). This called for a quick action. In the proposed masterplan, low income public housing units were designed (Verdeil, 2012). It was the largest neighborhood built by the government in Lebanon. A total of 1253 new houses was established for sheltering the victims of the earthquake. They were constructed in Saida and Mieh w Mieh by a national reconstruction authority (مصلحة التعمير لايواء المتضررين) (Al Kalash, 2001). This created a new residential area away from the dense city core.

Ecochard master plan for Saida was based on three main principles: **The old dense neighborhoods at the center of the city, the new city and the wide transportation networks that connected the city districts.** The roads defined the

design guiding framework, giving priority for pedestrian activity. The housing units were designed to receive adequate sunlight and ventilation. He discarded the dense fabric and narrow streets that linked them. **The built form was restricted by a setback limit from the street and a garden space was planned to each building** (Ghorayeb, 1995).

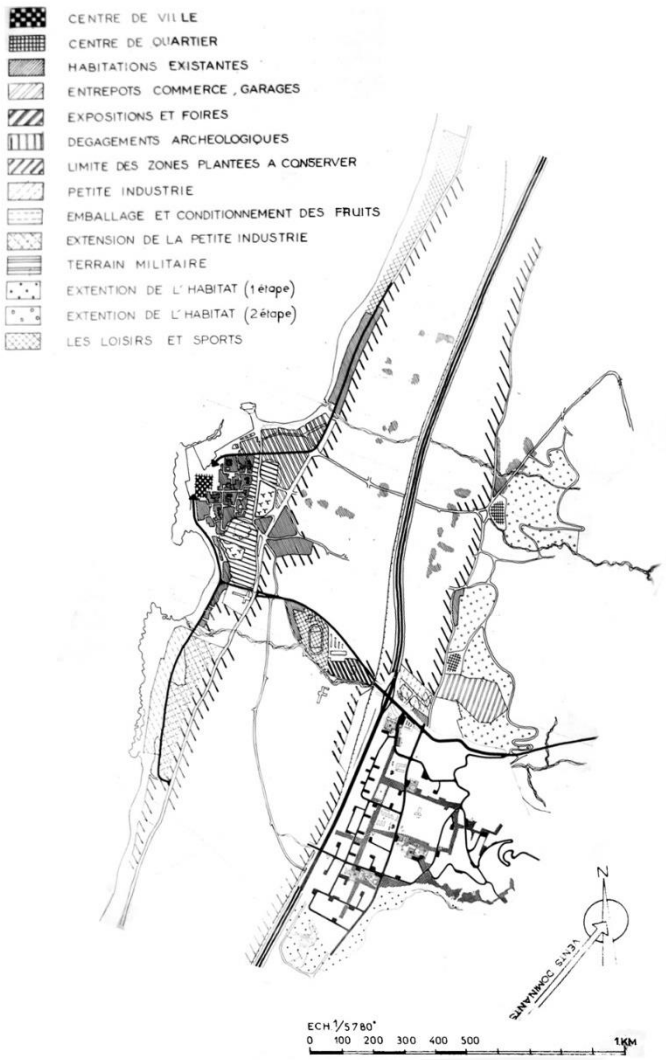


Figure 33: Saida Mass Plan as Proposed by Ecochard. Retrieved from Saida Municipality, 2017.

The main reference for the French architect was the Athens charter, written by elite architects at CIAM. It stated the principles of modern planning. Yet, Eco chard

adjusted his planning scheme to match the **ancient layers** of the city he was studying. In the old city of Saida, he defined the historical zone where he banned any new construction to replace the archeological sites that signify the city identity (Ghorayeb, 1995).

Eco chard submitted the master plan of Saida in 1957. The proposal acknowledged the city's belonging to its wider territory and the country as a whole. He studied how the surrounding territory influenced Saida and the impact of the city on its surroundings. He realized that the city can retrieve its glory days through its link with the adjacent hills. It can thus support the whole region to prosper. Ecochard's vision for Saida was not limited to its geographical boundaries. It was projected to have an influence on the neighboring urban fabric and on Lebanon as a whole (Ghorayeb, 1995).

One of the main themes that Ecochard defended was vehicular connectivity. He proposed building the coastal highway that passes from the north to the south, a highway that cuts Al Beqaa to Syria and connected Jezzine to Mashgharah (Refer to figure 34). This road network will give Saida a strategic economic position and will connect Saida to Syria and facilitate exporting citrus fruits from the city to the Gulf. The plan focused on reviving the economic status of Saida as the capital of the South (Ghorayeb, 1995). The coastal highway aided national connectivity yet bisected the city sphere by a wide vehicular artery.

The proposed urban design aimed to lead an economic growth in Saida and its surroundings to reach Jezzine. Ain El Hilweh was visualized as an active economic zone.

At the south of the city Eco chard defined a light industrial zone. It was mainly for fruits and vegetables processing. He identified the location of the juice and wine industries and the vegetable market (Ghorayeb, 1995).

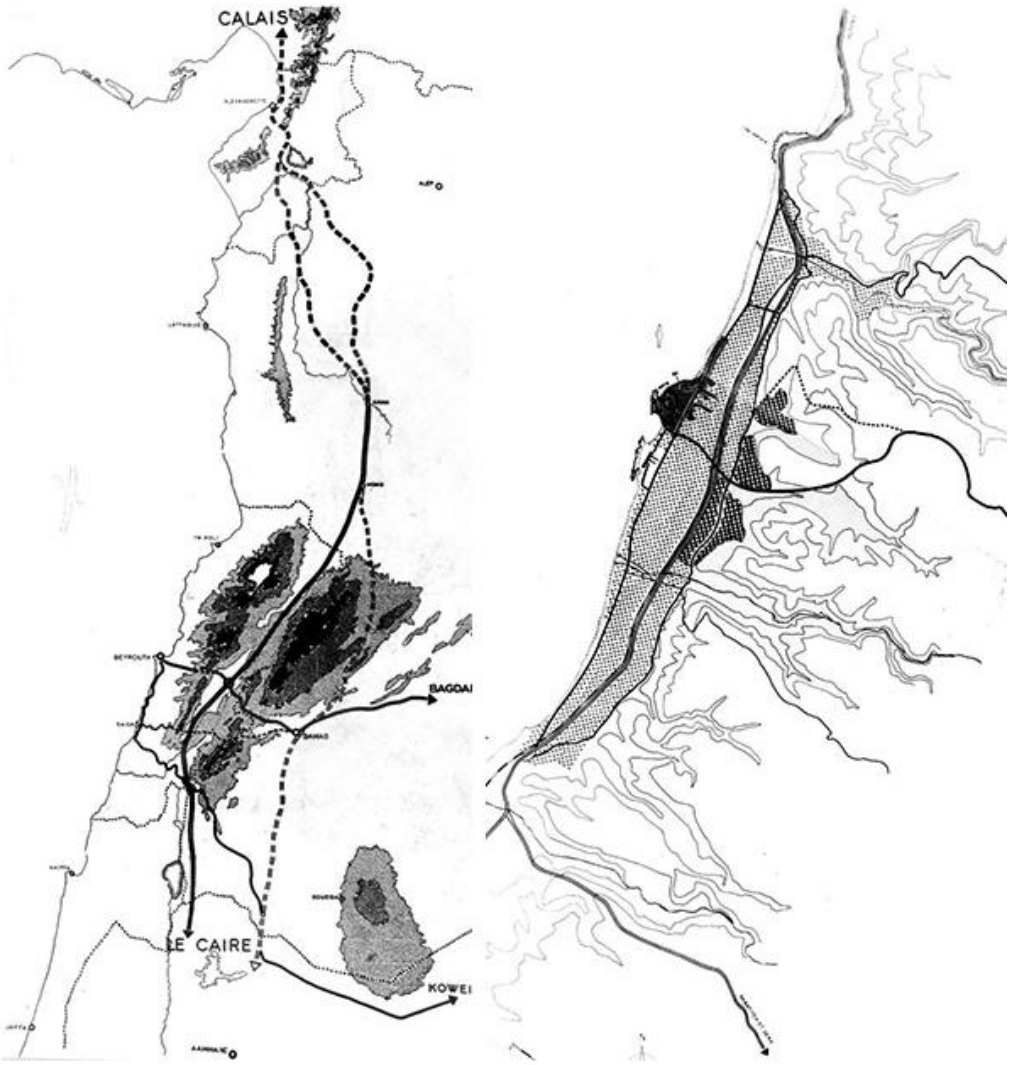


Figure 34: Ecochard envisioned regional highway and how it passes through Saida. Retrieved from Saida Municipality, 2017

Furthermore, Ecochard saw Saida a coastal city that flourished from her relation with its sea, but has lost that link. The coastal highway, 17 m in width, gives accessibility to its port to transform it into a vibrant sector. An inner road, connecting

East-West sides of the city and reaching Ain El Hilweh will be connected to the highway. This will form a well-connected road network. However, Eco chard recommended the demolition of many of the old houses in the historical city to realize this scheme. His proposal focused on removing the dense fabric around the archeological monuments and ease accessibility through the coastal road. The destruction that Ecochard demanded is not acceptable nowadays, yet back then they believed it would bring order to the old city and would regulate its circulation (Ghorayeb, 1995). In addition, the coastal road that was proposed and later executed with increased width, disconnected the city from its sea. Recently, the Barcelona report requested the highway to be narrowed to enhance the connectivity of the city to its shoreline.

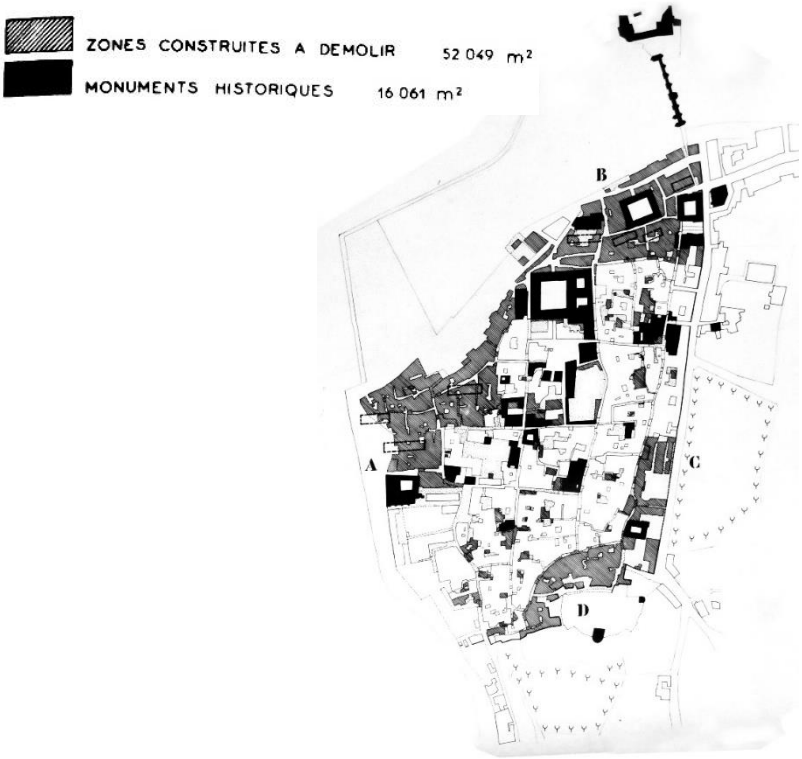


Figure 35: Ecochard proposal for buildings demolition in the old city. Retrieved from Saida Municipality, 2017

As for the existing fishermen port, Ecochard recommended improving productivity of the fishing industry by introducing new equipment, and by teaching the fishermen new skills. Furthermore, Ecochard suggested a touristic port southern the existing port that would be designed based on an economic and social study. This will aid the city to integrate with its surrounding territories (Ghorayeb, 1995).

Based on the ports location, Eco chard suggested a commercial line along the coastal road that faces the Sea castle, a large parking space and a hotel that overview the Sea and has an easy access to Saida central district (Ghorayeb, 1995).

Thus, Ecochard reconnected the old city with the Sea and connected the city with its adjacent districts and the country as a whole. His scheme combined the value of the past and the vision for the future. He cherished the historical monuments in the old city, yet he planned it to efficiently perform as a modern city (Ghorayeb, 1995).

Ain El Helweh as the new city:

Ecochard stated that the legacy of Saida embraces both, the city on the coast and the city on the hills. His new city was planned based on the city historical structure. Eco chard kept the old city as the central city for economy, culture, and administration. The new neighborhoods will be initiated to meet the natural growth rate and to provide houses for the people that are living in the buildings to be destroyed in the old city. To meet the standards of a modern city, he included a city for labors, a hospital, two high schools, all located at the eastern side of Saida, in Ein El Hilweh (Ghorayeb, 1995).

He planned the new city as the heart of the expanding urban areas at the hills. He connected it with Jezzine main road, and positioned multiple facilities in Ein El Hilweh: Two large office buildings, a fruit market, a center for light industries, a cinema, and

cafes. He wanted Ein El Hilweh to aid the economic development of the surrounding rural areas. Furthermore, he planned further expansions to handle the city local needs. Two other small centers, the first and the second expansions, were outlined (Ghorayeb, 1995).

Figure 36: The mass plan for the new city located at Ein El Helweh. Retrieved from Saida Municipality, 2017

He also noticed that the vehicular circulation is incompatible with the pedestrian movements. For that Ecochard planned green areas with a pedestrian network that doesn't interfere with the vehicular movements. He placed along this network public-benefit buildings such as mosques, churches, and medical dispensaries. This will

activate the network and ease access to the open spaces in the city. Moreover, he proposed a bus station and a sport and exhibition zone between the old city and Ein El Hilweh in the green zone (Ghorayeb, 1995).

Ecochard plans sought not only to solve the problems of the meantime but to build a vision for the future of the city. The zones defining the functions in the city aimed to bring order to the city and aid economic development. However, urban planning needs a central effective government, a general social agreement on the plans, and regulations to support its implementation. This clears out the reason why these plans were not executed (Ghorayeb, 1995).

a. 1962- formation of the General Directorate for Town Planning

The General Directorate for Town Planning and the Higher Council for Town Planning were formed in 1962 during the mandate of President Foaad Chehab (1958-1964). However, the directorate had small influence on planning for the impact of the French ideas was dominant for several years (Verdeil, 2012).

b. 1964- Eco chard's plans not realized

No plan of Eco chard was fully realized. Since the end of president Chehab mandate, he never worked again for the Lebanese government. The plans were altered and Eco chard left the country with a feeling of betrayal (Verdeil, 2012).

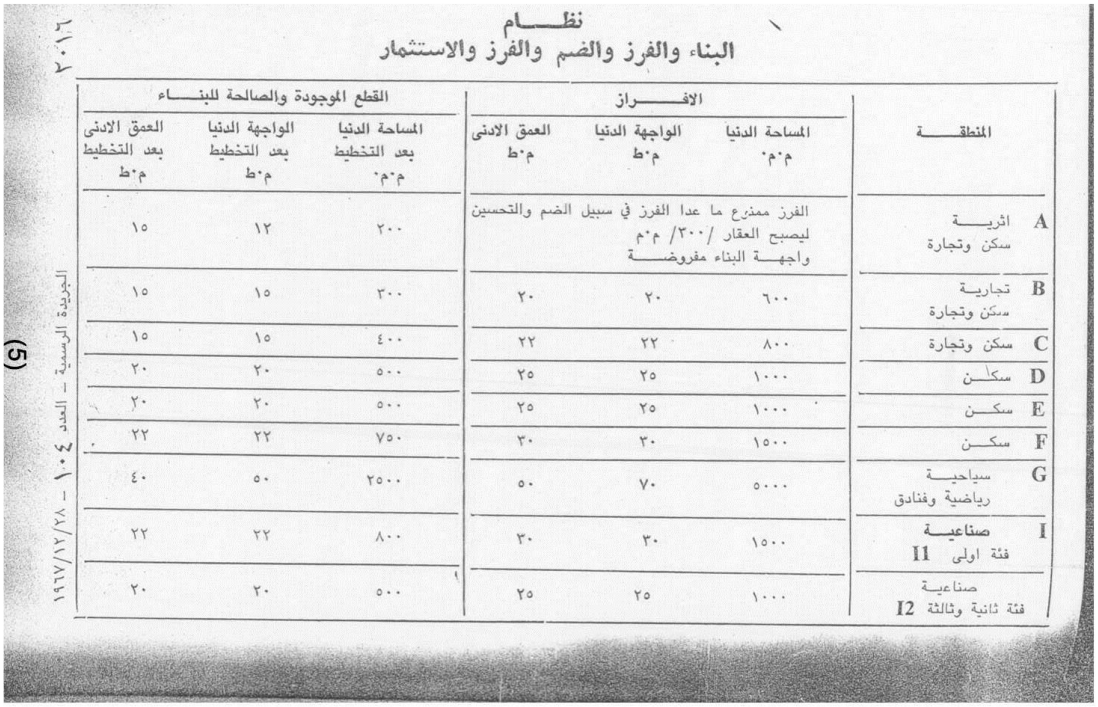
Similarly, the plans set during the Chehab mandate were partially realized. To begin with, landowners were able to alter the zoning scheme by the force of pressure before implementation. Second, the country faced hard economic status after the regional crisis in 1967 (Nasr et Verdeil, 2008). Lastly, Lebanon had various political

alliances from the independence till the civil war which affected its planning ordinances (Verdeil, 2012).

The influence Eco chard had left in the developing countries will keep his memory. The French planner held the themes of modernism as set by CIAM yet tried to implement it in accordance with the existing urban layers. Even though most of his plans were not implemented; his legacy holds a respectable model for urban planning in Lebanon (Verdeil, 2012).

7. 1967- Adjusted masterplan of Saida

In 1967, the adjusted masterplan of the city of Saida was issued. It was the primary version of a general zoning scheme for the city. By thus, Saida residents started moving to the eastern hills where exploitation ratios are higher (Al Kalash, 2001). Furthermore, the south highway based on Eco chard study was issued by the decree no. 9016 but wasn't executed.



نظـــام
البناء والفرز والضم والفرز والاستثمار

المنطقة	الافراز			القطع الموجودة والصالحة للبناء		
	المساحة الدنيا م٠م٠	الواجهة الدنيا م٠ط	العمق الادنى م٠ط	المساحة الدنيا بعد التخطيط م٠م٠	الواجهة الدنيا بعد التخطيط م٠ط	العمق الادنى بعد التخطيط م٠ط
A اثرية سكن وتجارة	الفرز ممنوع ما عدا الفرز في سبيل الضم والتحسين ليصبح العقار /٣٠٠/ م٠م واجهة البناء مفروضة			٢٠٠	١٢	١٥
B تجارية سكن وتجارة	٦٠٠	٢٠	٢٠	٣٠٠	١٥	١٥
C سكن وتجارة	٨٠٠	٢٢	٢٢	٤٠٠	١٥	١٥
D سكن	١٠٠٠	٢٥	٢٥	٥٠٠	٢٠	٢٠
E سكن	١٠٠٠	٢٥	٢٥	٥٠٠	٢٠	٢٠
F سكن	١٥٠٠	٣٠	٣٠	٧٥٠	٢٢	٢٢
G سياحية رياضية وفنادق	٥٠٠٠	٧٠	٥٠	٢٥٠٠	٥٠	٤٠
I صناعية فئة اولى I1	١٥٠٠	٣٠	٣٠	٨٠٠	٢٢	٢٢
صناعية فئة ثانية وثالثة I2	١٠٠٠	٢٥	٢٥	٥٠٠	٢٠	٢٠

الجريدة الرسمية – العدد ١٠٤٤ – ١٩٦٧/١٢/٢٨

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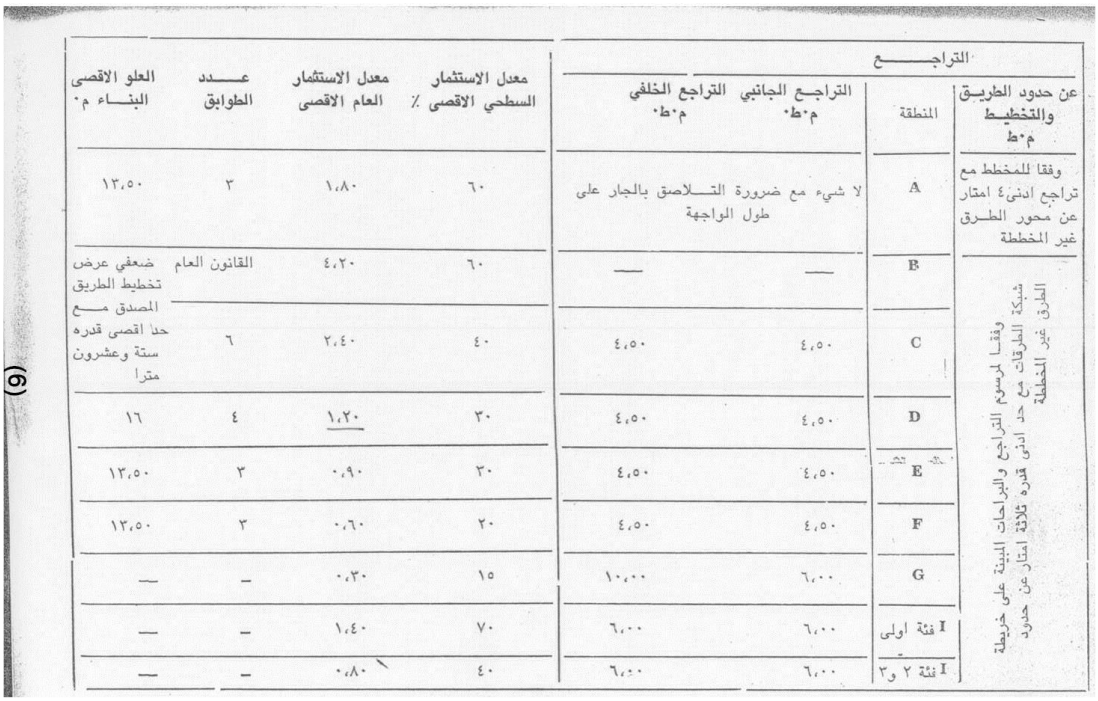


عن حدود الطريق والتخطيط م٠ط	المنطقة	التراجع الجانبي م٠ط٠	التراجع الخلفي م٠ط٠	معدل الاستثمار السطحي الاقصى ٪	معدل الاستثمار العام الاقصى	عدد الطوابق	العلو الاقصى البناء م٠
وفقا للمخطط مع تراجع ادنى ٤ امتار عن محور الطرق غير المخططة	A	لا شيء مع ضرورة التلاصق بالجار على طول الواجهة		٦٠	١،٨٠	٣	١٣،٥٠
شبكة الطرقات مع حد ادنى قدره ثلاثة امتار عن حدود الطرق غير المخططة وفقا لرسوم التراجع والبراحات المبينة على خريطة	B	—	—	٦٠	٤،٢٠	القانون العام	ضعفي عرض تخطيط الطريق المصدق مع حدا اقصى قدره ستة وعشرون مترا
	C	٤،٥٠	٤،٥٠	٤٠	٢،٤٠	٦	
	D	٤،٥٠	٤،٥٠	٣٠	١،٢٠	٤	١٦
	E	٤،٥٠	٤،٥٠	٣٠	٠،٩٠	٣	١٣،٥٠
	F	٤،٥٠	٤،٥٠	٢٠	٠،٦٠	٣	١٣،٥٠
	G	٦،٠٠	١٠،٠٠	١٥	٠،٣٠	—	—
	I فئة اولى	٦،٠٠	٦،٠٠	٧٠	١،٤٠	—	—
	I فئة ٢ و٣	٦،٠٠	٦،٠٠	٤٠	٠،٨٠	—	—

(6)

Figure 37: Saida building law. Source: The public newspaper 1967 retrieved from Sabbagh, 2015

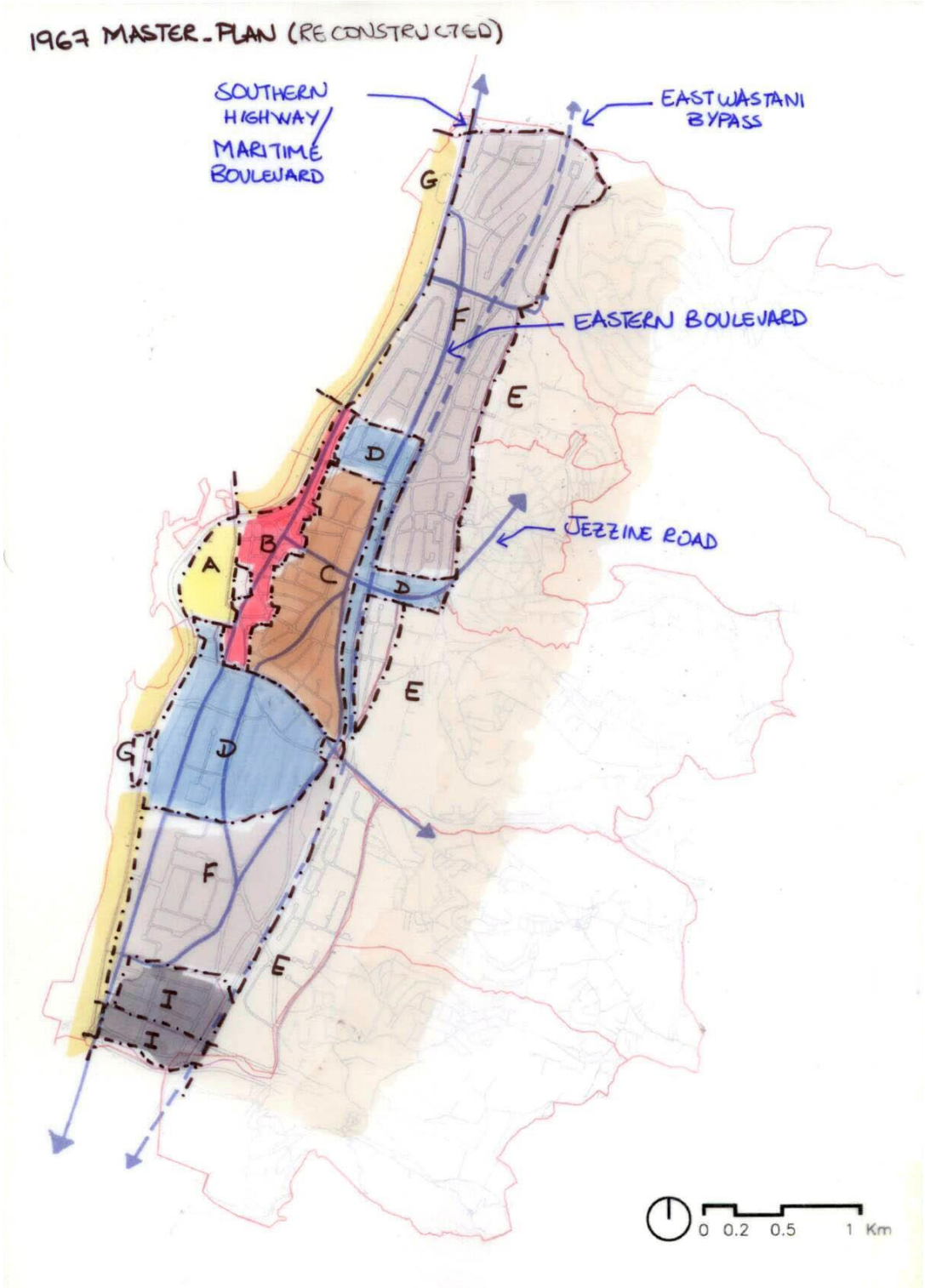


Figure 38: 1967 Masterplan. Source: Sabbagh, 2015.

8. 1972- Sultaneye Expressway Decree:

The Sultaneye Road links North-South ends of the city. In 1972, Decree 3407 was issued to transform the road into an expressway (Dar Al Handasah, 1994). However, to this day it has not been executed. The expressway is located at the eastern city boundary, its execution will form an edge between the city and its extensions on the hillside.

9. 1975- The beginning of the Civil war.

The Lebanese civil war extended from 1975 till 1990. The war left traces of sectarian divisions in the country and laid a sectarian political regime that the country still suffers from till the day. In Saida, the war in eastern Saida is well known by the residents. Numerous Christian residents left their houses to settle in other parts of the country where Christians present the majority of the population.

10. 1978-1998- The formation of an active municipal council five years after the dissolution of the previous municipal council and related events

The municipal council, headed by Engineer Ahmad Al Kalash, led the construction and reconstruction process in the city after the Israeli Invasion among other major projects in the city (Al Kalash, 2001). A brief description of the council actions and the related events at the time are illustrated.

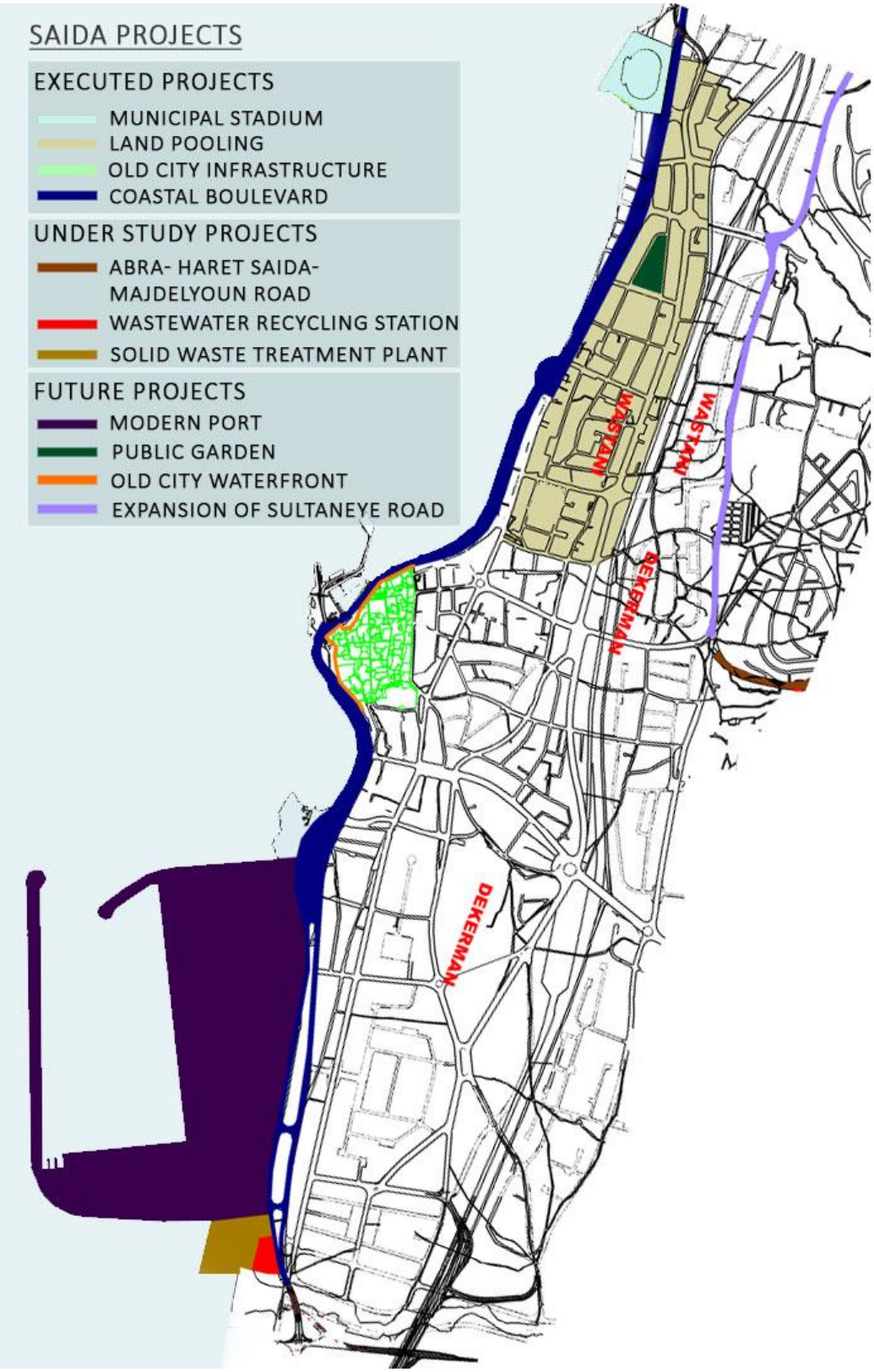


Figure 39: The city considered projects between the years of 1982-1994. Source: Hariri Foundation, Saida the gate for the east, 2001.

a. 1978- Saida-Zahrani municipal union

In 1978, the Saida-Zahrani municipal union was created. It was formed based on the decree 1097, to execute projects for the benefit of the union (Kalash, 2001). The union includes: Saida, Bramieh, Hilalieh, Abra, Salhieh, Majdelyoun, Haret Saida, Al Mieh w Mieh, Darb el Seem, Magdoshi, Al Ghazieh, and Ankoun. Its total area is 4500 Hectare (Al Kalash, 2001). In 2001 and 2002 Ain El Deleb and Bqosta were added respectively to reach a total of fifteen municipalities (localiban, 2017). The union is headed by the municipality of Saida, for having the largest area within. The union is formed from multiple political and religious affiliations. The fact that hindered its activity and a resulted in a very weak coordination between Saida and many of its neighboring municipalities.

b. 1980- The Eastern Boulevard construction

The Eastern Boulevard construction was executed in 1980 (Al Kalash, 2001) to reduce the congestion at Riad Al Soloh Street and provide better vehicular connectivity in the city (Dar Al Handasah, 1994). The boulevard aided North-South vehicular connectivity, yet bisected the city inner fabric with a wide vehicular artery.

c. 1982- Western Wastani land pooling

In 1982, the decree for Western Wastani land pooling was issued. However, it wasn't executed until 1985. The project needed five years to be implemented (Barcelona Report, 2014). As a result, all lots have access to the road, are buildable, and their economic value increased. The total area of the project was 823 acres divided as follows: 215 acres new roads, 83 acres gardens and services, 525 acres new lot divisions (Daher, 2001). However, the garden lots were later developed as public institutions. As

a result, the executed land pooling project today holds only one fenced vacant lot that is still waiting to be developed as a public garden.

d. 1982-1985- Israeli Invasion:

Between 1982 and 1985, Saida faced economic recession due to Israeli invasion. Private and public buildings were destroyed; including the municipality building. The old city waterfront was bombed. The electrical, telephone, and sewage networks deteriorated. As a result, the city was disconnected from the rest of the country (Kalash, 2001).

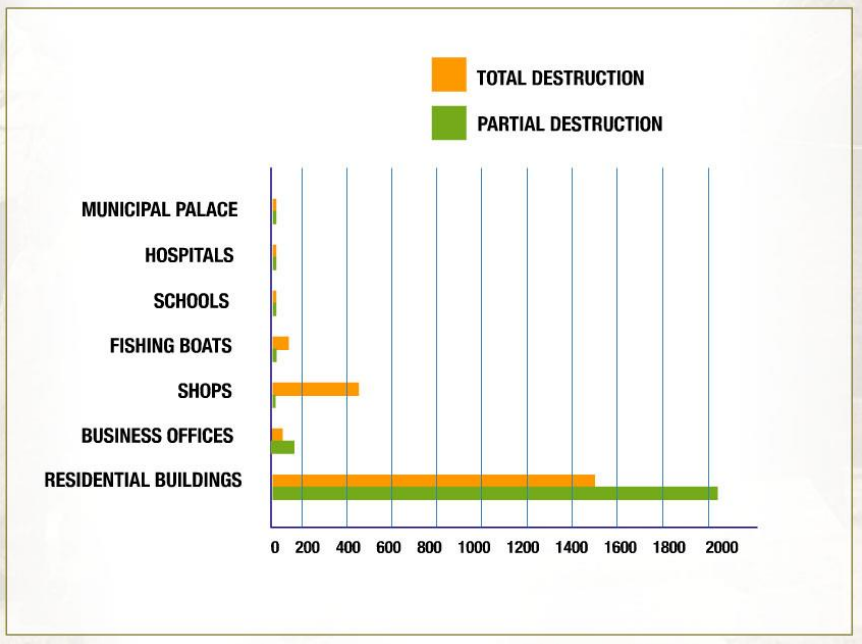


Figure 40: The destruction caused by the Israeli Invasion in Saida. Source: Hariri Foundation, Saida the gate for the east, 2001.

e. 1982-1989- Improving vehicular connectivity

During the 1980s, the municipality was active with the support of the former Prime Minister Rafiq Al Hariri. Buildings were reconstructed, Streets were widened and renovated, and electric, telephone and sewage networks were channeled under street

network (Kalash, 2001). The percentage of roads in the city increased from 7% to 17% (Kalash, 2001). During these construction works, rivers were channeled in pipes under newly constructed roads, Al Qamlah River, Al Barghouth River, BouGiath and Ain Zaytoun (Kalash, 2001). Back then, this was considered as an act of city modernization. However, today the USUDS report recommended to daylight these streams.

Figure 41: Saida roads executed and rehabilitated between 1982 and 1994. Source: Hariri Foundation, Saida the gate for the east, 2001.

Figure 42: Al Qamleh River was channeled in concrete pipes under the city roads. Source: Saida municipality, The accomplishments of Saida municipality in 20 years, 1998.

f. 1987- Construction of the vegetable market at the southern entrance of the city

The market acts as a main wholesale market for fruits and vegetables in the city till the date. It aided to activate its surrounding area with numerous retail stores that later opened around.

g. 1994- Construction of the Coastal Highway

In 1994 Dar Al Handasah, Shair and Partners proposed a solution for the increasing traffic in the city. Through studying different alternatives, Dar Al Handasah proposed a design for a coastal highway. Because of the limited area between the old city and the harbor, it suggested a shifted line to be executed above the harbor. It will be elevated about 4.5 M to provide access underneath it for the fisherman harbor to the sea. The elevated expressway provides a panoramic view to both, the old city and the sea and will move traffic away from the historic sea front (Dar Al Handasah, 1994).

Dar Al Handasah recommended this design for its cost and efficiency if compared to other alternatives. The coastal expressway could be executed along with urban landscape to provide a more sustainable solution. Dar Al Handasah emphasized that the city infrastructure needs to be adjusted to accommodate the projected through traffic (Dar Al Handasah, 1994).

In 1995, the Decree for a coastal highway was issued, and the execution phase was initiated in 1998 (Al Kalash, 2001). Yet, the design of Dar Al Handasah was not fully realized. The highway acts as a through traffic artery negatively affecting the surrounding areas, the old city as one example and hinders a safe pedestrian crossing to the shoreline.

Figure 43: Saida Corniche urban treatment Proposal. Source: Dar Al Handasah, 1994

Figure 44: View of the improved old town area. Source: Dar Al Handasah, 1994 retrieved from Saida Municipality.

11. 1995- Adjustments in the building law: The general zoning layout is adjusted and a higher exploitation ratio was released.

التصميم والنظام التوجيهي والتفصيلي العام لمدينة

صيدا

مرسوم رقم ٦٥٥٢ تاريخ ١٩٩٥/٣/٢١

نظـــــام
البناء والفرز والضم والفرز والاستثمار

المنطقة	الافـــراز			القطع الموجودة الصالحة للبناء			التراجع			معدل الاستثمار السطحي الاقصى ٪	عامل الاستثمار العام الاقصى	حده الطوابق	العلو الاقصى للبناء باستثناء أقاصي السلالم والمصاعد وخزان المياه ولكتات القرميد والمدخنات
	المساحة الدنيا م٢	الواجهة الدنيا ط٢	العمق الادنى ط٢	المساحة الدنيا م٢	الواجهة الدنيا ط٢	العمق الادنى ط٢	التراجع عن حدود التخطيط والطريق	التراجع الجانبي ط٢	التراجع الخلفي ط٢				
A اثرية سكن وتجارة	الفرز ممنوع ما عدا الفرز بهدف الضم للتحسين ليصبح العقار ٢٠٠م٢			٢٠٠	١٢	١٢	وفقاً لمرسوم التراجع عن المحور فقط والبراج المبين على خريطة شبكة الطرق مع حد أدنى ثلاثة أمتار عن حدود الطريق او التخطيط	–	–	٦٠	١,٨٠	٣	١٣,٥٠
B سكن كثيف جداً وتجارة	٦٠٠	٢٠	٢٠	٣٠٠	١٥	١٢		–	–	٦٠	٤,٢٠	–	–
C سكن كثيف وتجارة	٨٠٠	٢٠	٢٠	٤٠٠	١٥	١٥		–	٤,٥٠	٤٠	٢,٤٠	–	–
D سكن متوسط الكثافة وتجارة	١٠٠٠	٢٥	٢٥	٥٠٠	١٦	١٦		–	٤,٥٠	٣٠	١,٢٠	–	١٩
D1 سكن متوسط وتجارة	تخضع هذه المنطقة لنظام D إذا أعدت للسكن والتجارة وفي حال تخصص العقار للاستعمال السياحي فقط (شاليهات ومطاعم فنادق) ترفع عوامل الاستثمار لغاية ٤٠٪ السطحي و١,٥٠ عام												
E سكن	١٠٠٠	٢٥	٢٥	٦٠٠	١٨	١٨		٤,٥٠	٤,٥٠	٣٠	٠,٩٠	٣	١٣,٥٠
F سكن خفيف	١٢٠٠	٣٠	٣٠	٧٥٠	٢٠	٢٠		٤,٥٠	٤,٥٠	٢٠	٠,٦٠	٣	١٣,٥٠
I صناعية	١٥٠٠	٣٠	٣٥	١٠٠٠	٢٢	٢٢		٦	٦	٧٠	١,٤٠	–	–
I1 صناعية	١٢٠٠	٣٠	٣٠	٨٠٠	٢٠	٢٠		٤,٥٠	٤,٥٠	٤٠	٠,٨٠	–	–
G سياحة	٥٠٠٠	٦٠	٦٠	٢٥٠٠	٥٠	٤٠		٦	١٠	١٥	٠,٣٠	–	–
G1 سياحة	٤٠٠٠	٥٠	٦٠	١٥٠٠	٣٠	٣٠		٦	٦	٢٠	٠,٦٠	–	–

Figure 45: Saida adjusted building law in 1995

12. 1996- A new port in the city

In 1996, the decree 8938 was issued to initiate The Lebanese Society for the Development of the Coast of Saida. It was assigned to build a new port in the city. After

a detailed area study, Dar Al Handasah, Shair and partners and in coordination with the port of Hamburg suggested a port located at the south of the city. It was designed on an area of 120 Hectares with a 70 Hectares water body area. However, this study was not executed (Al Kalash, 2001).

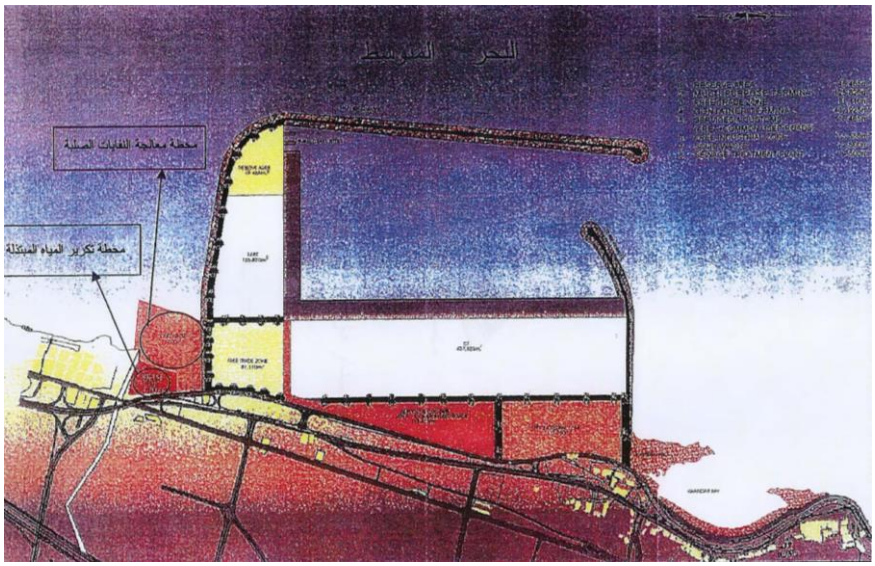


Figure 46: New port Design with water and solid treatment plans. Source: Al Kalash, 2001

13. 2000 Opening of the Municipal Stadium

At the northern city entrance, a sports complex was designed as a renovation for the old municipal stadium. The project included a shopping center, commercial spaces, hotel, and a marina next to the upgraded stadium (Laceco, 2017). The project aimed to be a main destination point in the city, however only the stadium was executed and it is poorly activated.

Figure 47: Saida Municipal Stadium. Designed. Source: Laceco.com.

Figure 48: Saida Municipal Stadium. Executed. Source: Laceco.com.

14. 2002- Saida Seafront Proposal

In 2002, Dar Al Omran restructured the coastal line as a touristic, commercial, and Sports Avenue. They proposed three poles, heritage, trade, and sport pole.

1. The heritage pole proposition included:
    - Urban renewal to conserve character and identity of the old city
    - New green spaces within and around the old city
    - A heritage trail in the old city
    - A fish market facing the old city
    - A buffer area between the old city and the new city expansions

- An urban typology for the expansions along the seafront that holds the spirit of the old town (low rise buildings with porched shops

2. The trade pole incorporated a new port southern the old city.
3. The sport pole increased the municipal playground area at the city north entrance to include touristic activities such as hotels and restaurants (Dar Al Omran, 2002).

The proposal aimed for a cohesive seafront, however it was not implemented.

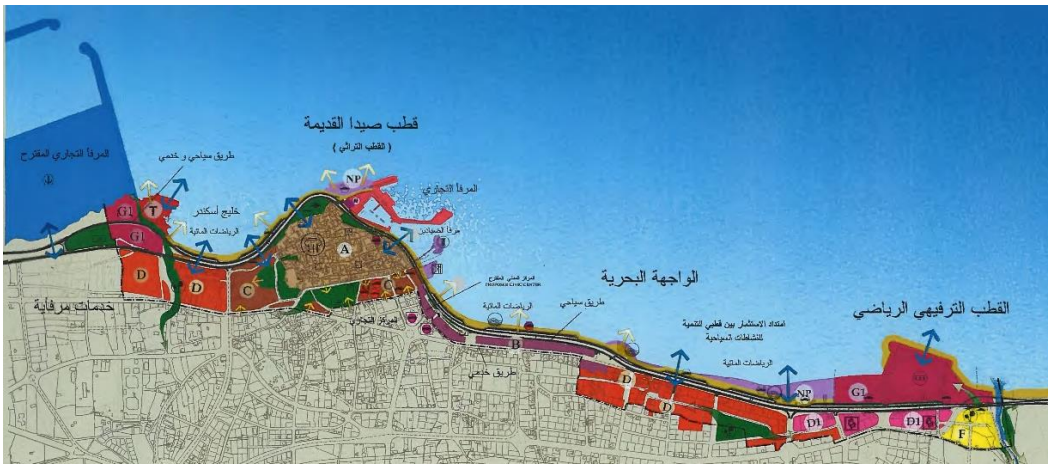


Figure 49: Saida Seafront Master Plan. Source: Dar Al Omran, 2002 retrieved from Saida Municipality 2017.

Figure 50: Saida Seafront Proposal. Source: Dar Al Omran, 2002 retrieved from Saida Municipality 2017.

15. 2005- National physical masterplan

The national master plan in 2005 analyzed the urbanized areas to be in the next 30 years considering cities and their bordering areas. It concluded that Saida being one of the main agglomerations in Lebanon will need 6000 to 10000 hectares to accommodate its increasing population. These numbers depend on the Palestinians settlements in the city. It will significantly change if any resolution led to their return to their country and to the closure of Ein El Helweh camp (DAR-IAURIF, 2005).

	Urbanized surfaces in 2000 (km^2)	Resident population 2000	Urbanized surfaces in 2030 (km^2)	Resident population 2030
Saida	3.3	88,000	4.0	80,000
Suburbs	12.1	86,000	21.0	186,000
TOTAL	15.4	166,000	25.0	266,000

Figure 51: Urban and demographic growth in the agglomeration of Saida. Source: DAR-IAURIF, 2005.

The population growth will increase the demand on natural resources. Groundwater is already negatively affected by infiltrated pollutants and is in critical situation. The projected scenario may be catastrophic if no treatment or solution is applied. It is one of the major pressures that face the country in the coming years (DAR-IAURIF, 2005).

In addition, solid wastes in the country are not well managed, and are left in unregulated dumps, Saida as a clear example. There is a need to build a treatment plant in the city among other cities to manage the expected increase in solid wastes. These basic services are in need for further study (DAR-IAURIF, 2005).

As for the plans for Saida, the report proposed developing commercial activities in the city for being "a gate" of the South region. It is one of three main agglomerations in the South. These urban areas, forming more than 44% of the south population, are Saida, Tyr, and Nabatiyeh. The three must have complementary activities and are suggested as follows, trade for Saida, tourism for Tyr and higher education for Nabatieh. Al Zahrani could act as an industrial area in between them (DAR-IAURIF, 2005).

As for commerce, the city is well known for its agricultural plains and fishing activity. Furthermore, Saida must focus on its assets. The city has a heritage site and is well known for its traditional crafts. Thus, it could serve as a touristic destination. However, the report noted that its proximity to the capital may negatively affect it from the economic and leisure base. (DAR-IAURIF, 2005).

Saida is a prime residential location, surrounded by hills overlooking the sea. Building regulations must be adjusted to benefit from this advantage and to preserve the greenery vision at the coastal plain (DAR-IAURIF, 2005).

As for the port in the city, it faces huge competition from other ports in the region and it is not capable of handling an increase in its capacity. Any increase will cause difficulties for the city. Saida port can only be developed and upgraded to offer better services. If there is a need to increase the port capacity, a new port could be located outside the city in mid-way between Saida and Tyr. (DAR-IAURIF, 2005).

Additionally, the report highlighted the need to preserve the coast line along the northern part of the city and the Sea castle (DAR-IAURIF, 2005).

The addressed points aimed to elevate the city economy and improve its condition, yet very little is implemented.

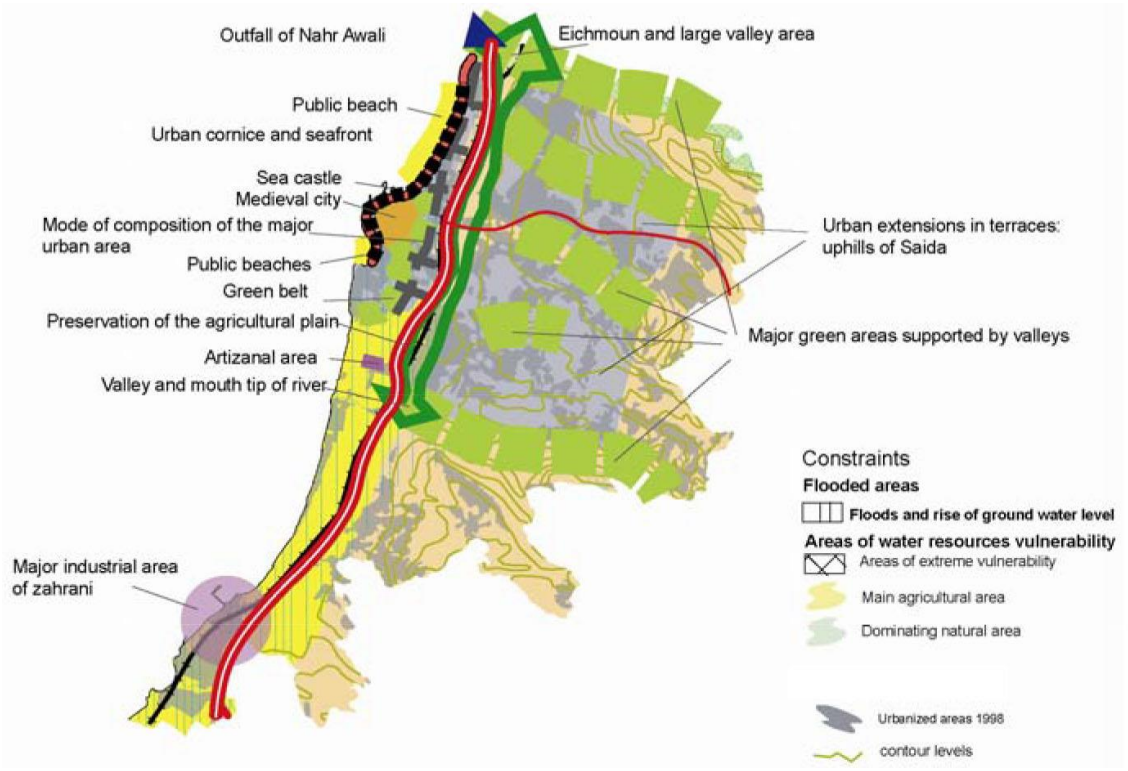


Figure 52: Saida masterplan Source: DAR-IAURIF, 2005.

16. 2011- Al Hara (Al Shammaa) Highway

The highway Connects Saida to the eastern villages, Majdelyoun, Salhieh, Kfar Jarra, Ein El Delb and starts at Al Qaneye Square.

17. 2012- The public garden

The municipality of Saida launched on Oct 2012 a project aimed at closing down the city's dump and transforming it into a public garden (Barcelona Report, 2014). The project was highlighted, for the city lacked open spaces and has no active public garden. In 2018, two years after the garden opening, a new garbage dump is being formed as a result of a political agreement. It is located beside the previous one, repeating the story of the old dump.

18. 2012- Degree for a new highway outside the city boundary

The aim of the highway is to release the city from the north-south increasing through traffic (CDR, 2012 as cited by Al Harithy et al., 2013). The city needs to consider plans to minimize the effects of vehicular arteries on the connectivity of its urban sphere. While planning new highways in the country no other tools are thought of, such as a public transportation network, and the utilization of the railroad (Al Harithy et al. 2013).

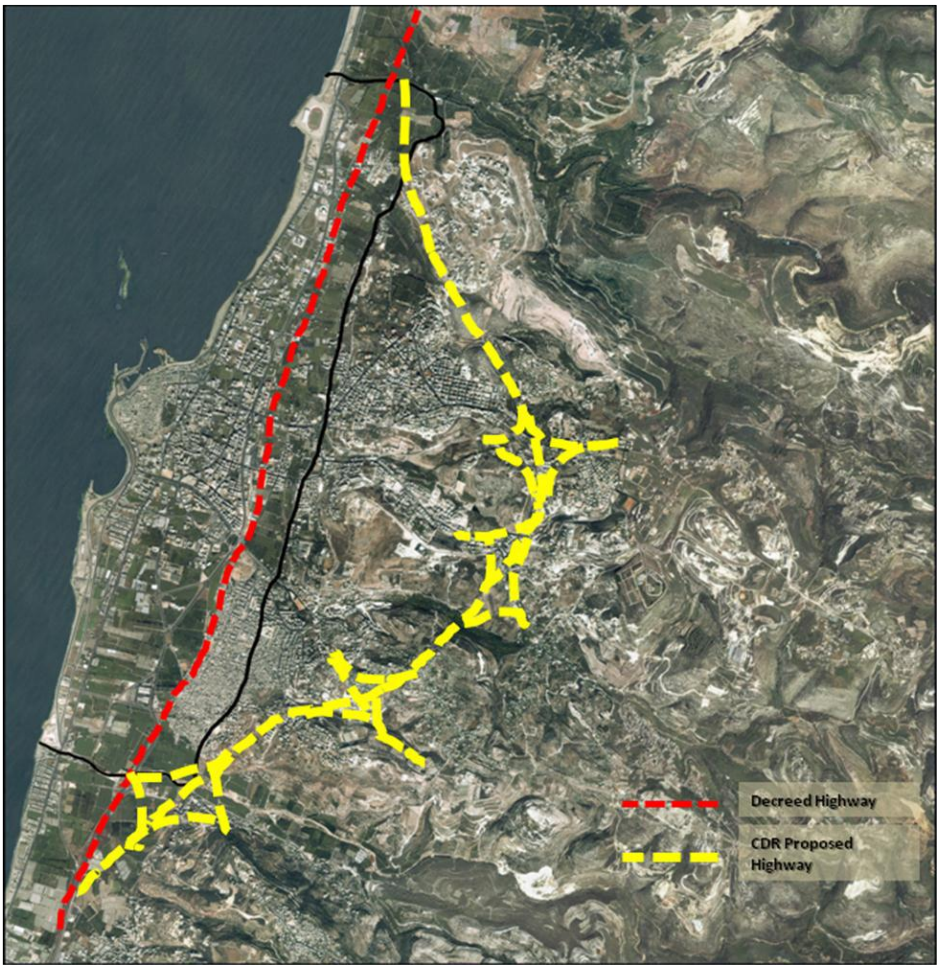


Figure 53: The CDR proposed highway as a substitute to the decreed and not executed highway. Source: CDR traffic plan, 2012 retrieved from USUDS descriptive memory report 2013.

19. 2014- USUDS Report

In 2014, Saida municipality in partnership with HFSHD (Hariri Foundation for sustainable human development) set the Urban Sustainable Development Strategy (USUDS) for Saida. It is a Euro Mediterranean project that aims to provide a holistic city study and aid its sustainable development. It embraces enhancing socio-economic status, preserving environmental resources, ensuring connection, collaboration, and cooperation between the city and its adjacent areas, setting legal framework, and increasing security in the city.

As the NPM (National physical masterplan), the USUDS report also focused on the city assets. It noted its strong political management, distinct green cover, vibrant cultural heritage, and its diversified based economy. It indicated that the city has to better manage its natural resources.

Some highlighted points in the report are:

1. The city proximity to the capital doesn't have a positive reflection on the city. On the regional scale, it faces hard competition with Tyr and Nabatiyeh. The two cities are strengthening their economic base and activating their resources. The advantage of having Saida as an administration center in the Mohafaza is also not being utilized to enhance the city economy.
2. On the municipal level, there are no inter municipal cooperation on projects that could serve the region. Missing such opportunity is negatively affecting Saida.
3. On the economic side, the city is over dependent on the real estate sector. Investors are deserting other existing sectors, and no new economic bases are initiated. This is not sustainable solution, the money invested in real state could have provided jobs for thousands of people. Besides, the fast urbanization in the city need to be regulated. In terms of public services, the low-density investments are pricier to the public sector than a dense urban pattern. Agricultural lands are not preserved in the city. They are future real estate projects awaiting investment.
4. As for the water resources in the city, population growth and urbanization extension have prevented replenishing existing springs.

Sayneq, a main river in the south of the city witnessed high reduction in its flow.

5. Public transportation in the city is dependent on the private sector. There is no vision to provide a public network in the city. The old railroad represents an abandoned opportunity that could serve as a public transportation way especially that the right of way is still owned by the government.
6. Poverty and security issues are highly threatening the city, especially by the increasing number of Palestinian refugees and the existence of the largest Palestinian camp in the country. In the meantime, some Syrian refugees also reside in the camp due the Syrian war. The total estimated number of Palestinian camp residents is around 105,000 persons compared to 217,747 persons residing in the entire union of municipalities.
7. Even though there are multiple initiatives considering the city cultural heritage and natural resources, little is implemented on the ground. There is a need to raise awareness and set a strategic vision to activate these assets. Saida visiting tourists are decreasing. This is due to the lack of future plans, touristic campaigns, coordination, security, and scheduled maintenance.

The report listed a number of suggested projects based on a multi layered analysis. Some are:

1. Initiating an agropole and managing the ecological network in the city to organize the rapid urban expansion and preserve natural resources. The

project holds a more sustainable vision for the city through valuing its distinctive assets. Thus, it aims to preserve the natural environment and enhance the city character. The network aims to improve the quality of living in the city though providing social encounters and enhance economic growth. The ecological network proposal is the thesis starting point. It is being analyzed and further developed.

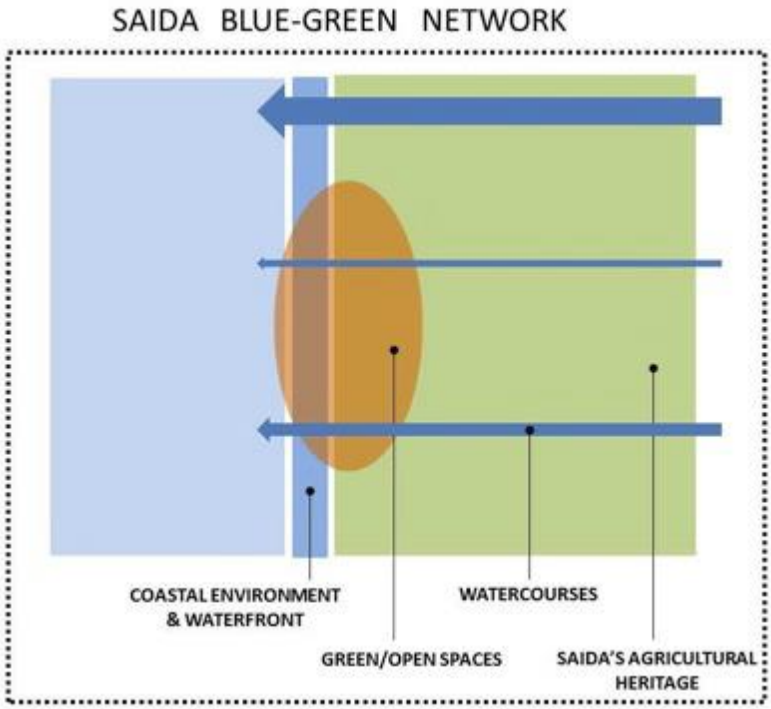


Figure 54: Saida Blue-Green Network. Source: Makhzoumi et al, 2014.

2. Planning a mixed-use urban zone in the reclaimed land at the coastal line and organizing land use at the seafront to obtain a coherent seafront.
3. Designing a sustainable port extension, upgrading fishing mechanisms and tools to connect the city to its sea.
4. Branding the old city and supporting traditional crafts to activate tourism.

The report as many other previous ones is not being realized in the city until the date.

20. 2014-6- Barcelona Report

In 2014, Saida municipality partnered with the municipality of Barcelona to restructure its shoreline. The released report enhanced the corniche facilities, rest areas and greenery. It widened the corniche width and enhanced accessibility to the sandy beach. It also recommended narrowing the coastal highway to decrease the speed of the vehicles along the public beach.

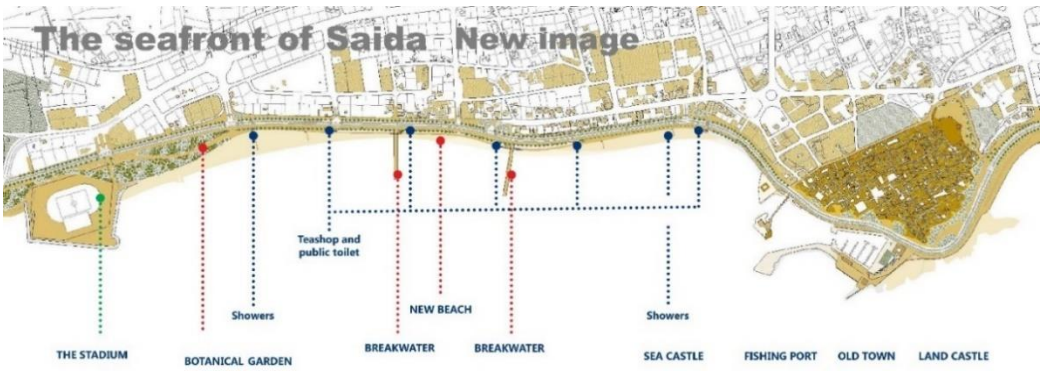


Figure 55: Saida Seafront Proposal. Source: Barcelona Report,2016

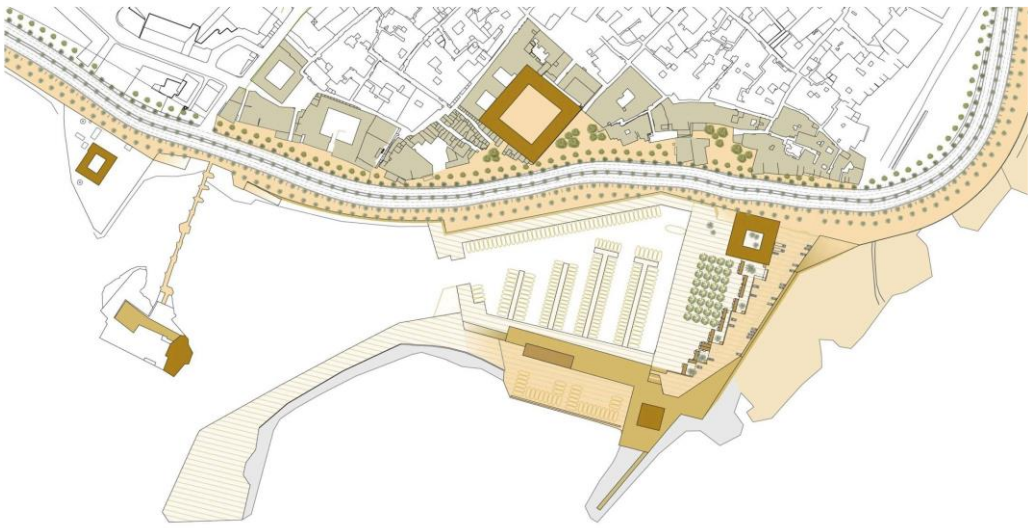


Figure 56: The port and fishermen dock. Source: Barcelona Report, 2016

The proposed design restructured the fishermen dock. It proposed a fish market, bars, shops, and a museum. All were designed within a wide public space (Barcelona Report,2016, 85). Yet, the project is not executed till the date.

Figure 57: New Saida's promenade Source: Barcelona Report, 2016, 65

21. 2014- New Commercial port

A new port is designed for tourism and commercial activities with adjacent public parking (JCC, 2017). It is located south of the old city. The project that was not recommended by the national physical masterplan nor by the USUDS report is being executed on a fast pace based on a political agenda.

Figure 58: New Commercial Port. Source: JCC, 2017

Figure 59: Saida new commercial port, 2017. Photo by: Mohammad Al Hariri

22. 2015- Saida Downtown Redevelopment

In 2015, the municipality aimed to redevelop the main commercial strip in the city, *the Souq*, and to provide an attractive pedestrian space within. Existing infrastructure was upgraded and urban scape was designed to enhance the economic status of the souk and the city as a whole (LDRS, 2015).

Figure 60: Saida Souks proposed vision. Source: LDRS, 2015.

23. 2017- Eastern land pooling project

Eastern Wastani land pooling project is hotly debated in the city. The municipality has no funding for the project and aims for the solution that gives the highest economic revenues to be able to execute the project. It is a large agricultural space in the city that is threatened to be totally urbanized through an outdated law.

Figure 61: Eastern Wastani land pooling limit. Retrieved from the DGU,2017

The city as a layered history

The described historical fragments expose the different planning approaches in the city. The underlying political

motivations, principles, or ideals were reflected in the urban proposals. Eco chard plan for Saida designed in the mid-50s was the first and only plan to propose a comprehensive scheme for the city, regarding the city economy, social, and natural assets. It was a feasible approach based on a future vision. Detailed in each proposition yet regarded the larger geographical context and the need to connect on a multi-level scale.

Eco chard project, among many other proposals, was not implemented. It was clear that the failure in executing many of them was the result of a weak state and a lack of solid political attitude. Today, the city is regulated by an outdated general zoning system, where many of its natural assets are threatened by rapid urbanization. These tools fail to accommodate the transformations in the city and to present a flexible mechanism to support the city social and ecological needs. The city is losing in the competition for nearby agglomeration for her little consideration of its valuable assets. In 2014, the USUDS analyzed the city layers thoroughly and suggested a strategic plan as a solution to the city problems. However, the implantation of this plan doesn't seem anywhere on the horizon. The easy way out is always considered in the city by executing short term solutions.

Table 1: Summary of main projects that affected connectivity in the city

YEAR	PROJECT	PHASE	IMPACT
1873	The construction of the first road outside the walls of the city	Executed	Vehicular Connectivity: Connecting the old city to its larger context

YEAR	PROJECT	PHASE	IMPACT
1942	The construction of the railroad	Executed Active between 1942&1948 in Saida.	Railway connectivity: Connecting the city with the country and the region.
1948	Establishment of Ein El Hilweh Camp	It is now the largest Palestinian refugee camp in Lebanon in terms of population and area.	It formed a gated security zone threatening the security of the city and creating a disconnected zone in the city.
1956-58 & 1962	Michael Eco chard Planning Saida	Not Executed	Economic Connectivity: Enhancing the old city economic connection with the sea Vehicular Connectivity: Connecting the old city with a modern new center Connecting the city with the eastern hills reaching Jezzine Connecting the city with the capital through a national network that bisected the city sphere Pedestrian Connectivity: Connecting pedestrians through a network that linked different city facilities.
1967	Adjusted Saida Masterplan	Implemented	General zoning blanket that is centered around market speculations No considerations for natural resources or site significance. One-layer plan of simple building regulations that failed to consider urban planning as a tool to incorporate a future vision and implement strategic goals.

YEAR	PROJECT	PHASE	IMPACT
1972	Sultaneye Expressway Decree	Not Executed	Vehicular Connectivity: North-South Road facilitating connectivity with Beirut and the south.
1978	Saida-Zahrani Municipal Union	Formed- Not active	Political Connectivity: The union formed for executing projects that could benefit the municipalities within. However, different political and religious affiliations weakened its activity.
1980	The Eastern Boulevard construction	Executed	Vehicular Connectivity: North-South Road facilitating connectivity with Beirut and the south. It negatively affected pedestrian circulation in the city.
1982	Western Wastani land pooling	Executed	Linking build-able lots to the city through a network of roads. Very little consideration to the city assets.
1982-1989	Upgrading, renovating and widening Street network	Executed	Vehicular connectivity: Better connectivity in the city sphere and the adjacent areas.
1994	Coastal Highway	Executed	Vehicular Connectivity: North-South Road facilitating connectivity with Beirut and the south. It negatively affected pedestrian circulation in the city.
2002	Saida Seafront Proposal	Not Executed	Pedestrian Connectivity: Restructuring the waterfront with a holistic vision
2011	Al Hara Highway	Executed	Vehicular Connectivity: East-West Road facilitating connectivity with Saida and its eastern villages

YEAR	PROJECT	PHASE	IMPACT
2012	CDR proposed Highway	Not Executed	Vehicular Connectivity: Facilitating north- south connectivity outside the city administrative boundary and releasing the city from increasing through traffic.
2014	USUDS Report	Not Executed	Pedestrian and green assets connectivity: One of the main projects proposed: Ecological network to highlight the city natural assets and suggest a series of connected open spaces to enhance the livability in the city.
2014	Seafront Proposal	Not Executed	Pedestrian Connectivity: Proposing a coherent city water front. Upgrading and providing different amenities to create a well-connected livable space along the coastal line.
2014	New commercial-touristic port	Under Construction	Enhancing tourism in the city and enforcing its connection with the region through the sea. However, it was not recommended by the national masterplan and the USUDS.
2015	Saida Downtown Upgrade	Executed	Pedestrian Connectivity: Renovating Saida main souk, creating pedestrian connected spaces and designing urban landscape.
2017	Eastern Wastani Land pooling	Under Study	Linking build-able lots to the city through a network of roads

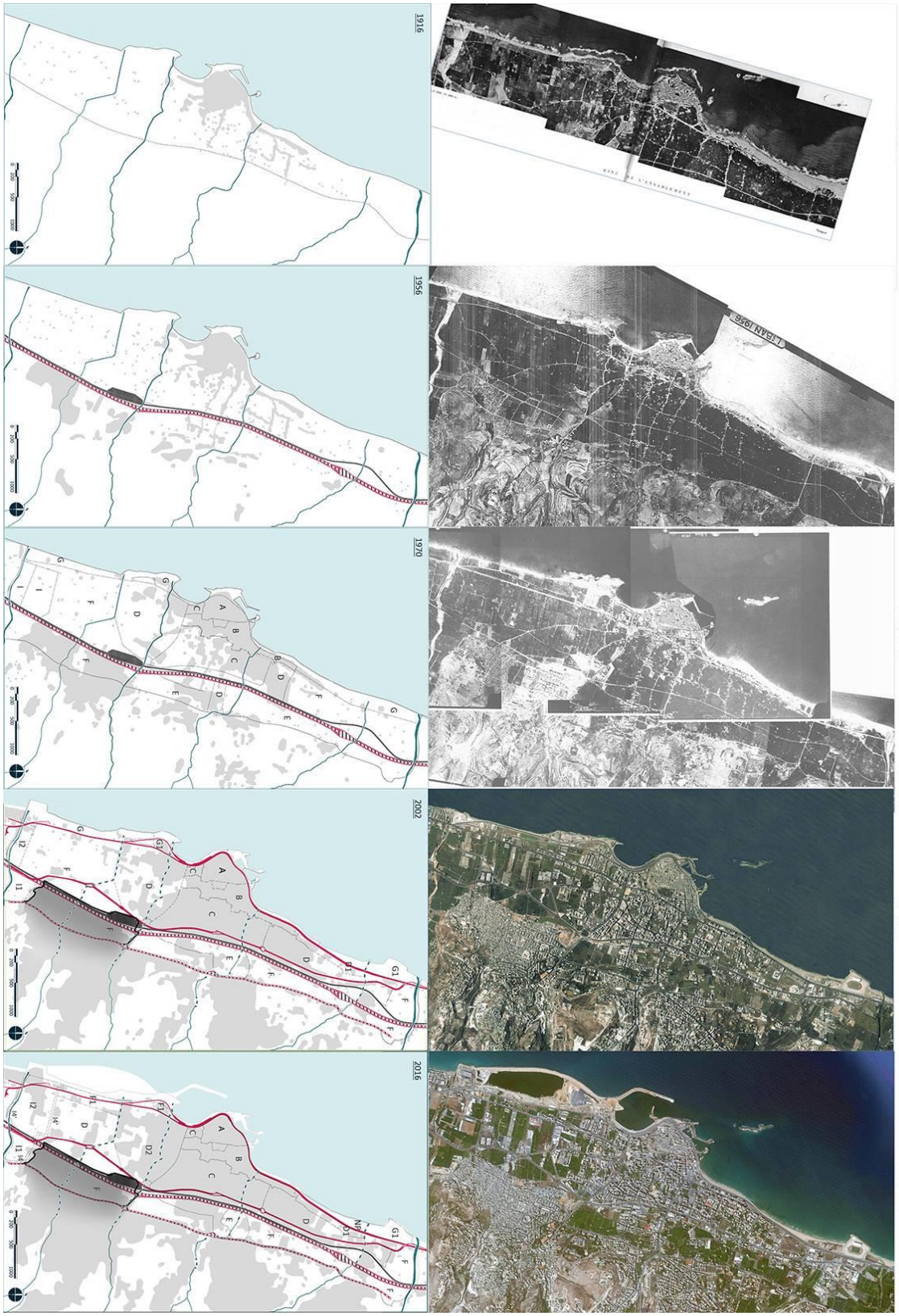


Figure 62: The evolution of major vehicular arteries bisecting the city over time.
Source: Author

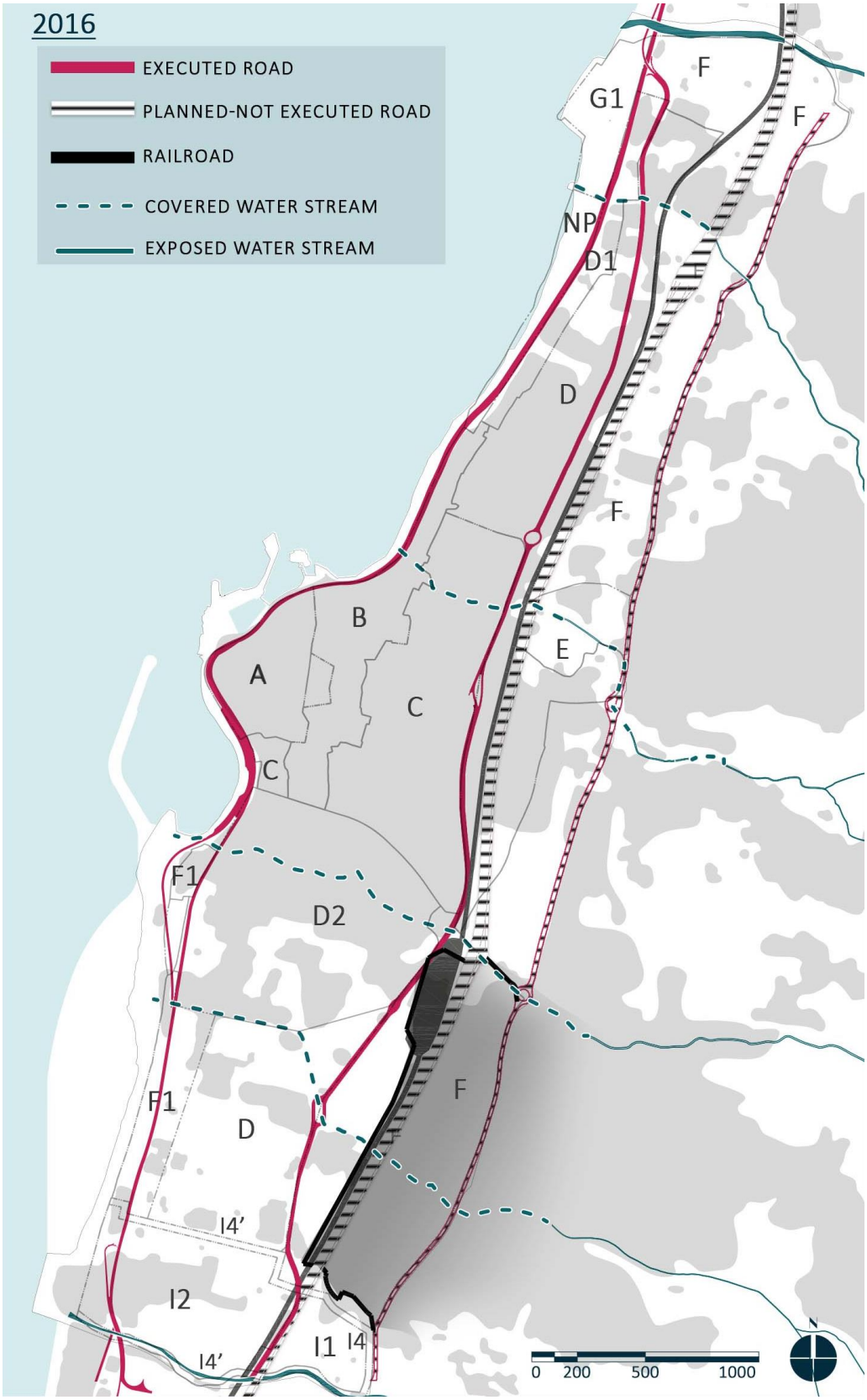


Figure 63: The existing vehicular arteries bisecting the city. Source: Author

B. City Scale Spatial Analysis

After a detailed historical analysis, the aim is to better understand the current urban sphere of the city. In this chapter, a general spatial analysis is presented to highlight the green assets and walkability layers in the city. By thus, it presents the city topography, administrative zones, main facilities, vacant and parking spaces, agricultural lots, public transportation network, and main sidewalks. It ends with defining the city character zones.

1. Topography

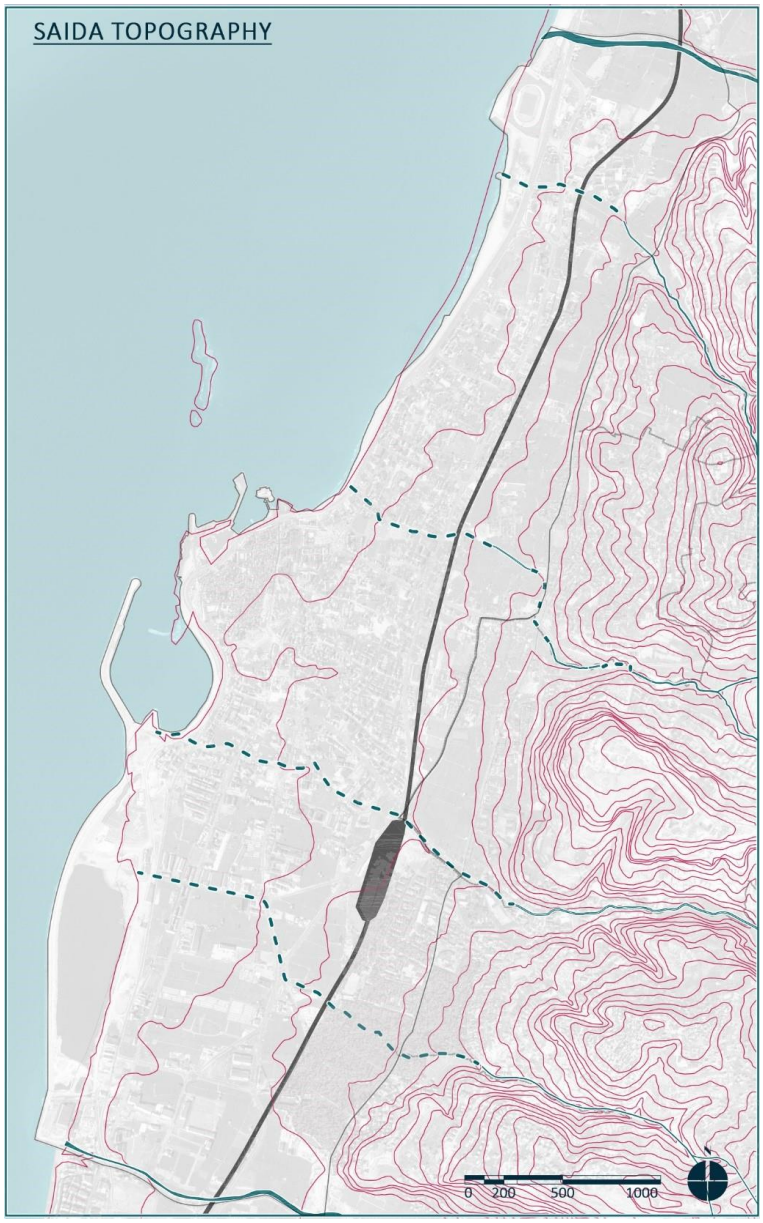


Figure 64: Saida contour Lines. Source: Author

Saida, had been an agricultural city for its fertile soil and gentle sloped land. The graph shows 10-meter contour intervals. While the administrative boundaries of the city lay within 3 contour lines the slope starts to be steep at the city eastern limit connecting Saida to its eastern expansions. This emphasizes the opportunity of developing a pedestrian network that connects the city boundaries and the need to enhance walkability experience within.

2. Administrative Zones

Figure 65: Saida zoning scheme. Source: Author

The city administrative divisions lay within a general ambiguous zoning scheme. It divides the city into multiple parcels defining the building heights, setbacks, percentage of exploitation and the land use of the zone. The land uses are defined as follows: A represents the old city, as a heritage residential and trade zone. Zone B has the highest exploitation ratio in the city that gradually declines respectively in C, D (D, D1, D2, and D3), E, and F. All are defined as residential and commercial zones. Note

that zone F and D3, have high percentage of agricultural lots. However, the law doesn't regard any preservation of these lots. They can be easily transformed into built up spaces. The agricultural spaces still survive in the city for multiple reasons. While the profit of real estate surpasses the profit of the agricultural lots, land owners still plant their lands and sell their agricultural products. In eastern Saida, the lots are waiting for a land pooling project, where numerous lots don't have access to the road nor do their proportions allow for a construction project. Some lots are bisected by an unexecuted road planning schemes which prohibited building on large parts of the lots. These factors negatively affected the prices of the lots yet preserved the old character of the space. Landowners consider agriculture as the best current way to profit from their lots.

Furthermore, the city south holds many agricultural lots that still exists. Zone I (I2, I2', I4, I4'), at the south of the city is defined as industrial. Due to high land prices in the city many preferred to build their industries on cheaper lots in nearby areas, Ghazieh as the nearest example. To add, the shoreline line around this point held for years a garbage mountain emitting bad odors and creating an unhealthy atmosphere in the surrounding neighborhoods. Last, the south of the city holds Ain El Hilweh Camp, an unsecure area that constantly threaten the nearby districts. All of the above facilitated in retaining part of the historical agricultural lots in the city. However, they are still under the threat of transformation in favor of real estate. The green character in Saida is gradually degrading with no implemented green vision in the city.

3. Main Facilities

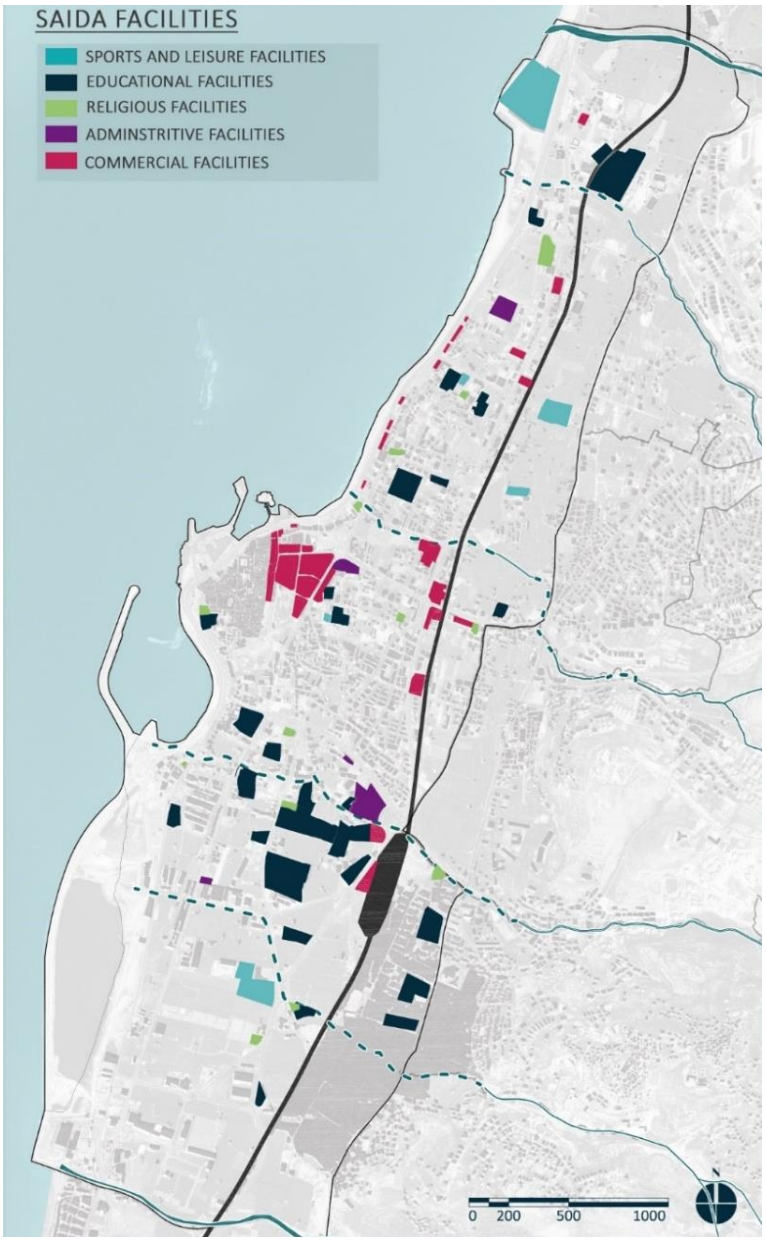


Figure 66: Saida main Facilities. Source: Author

The city has multiple facilities that act as attraction points and can be part of a series of nodes in a pedestrian network. These are focused around the city center and *the* western Wastani land pooling project. The rest of the city is poorly connected to the residents' daily routine because it is enclosed or inactive space in Saida.

4. Vacant- Parking Spaces

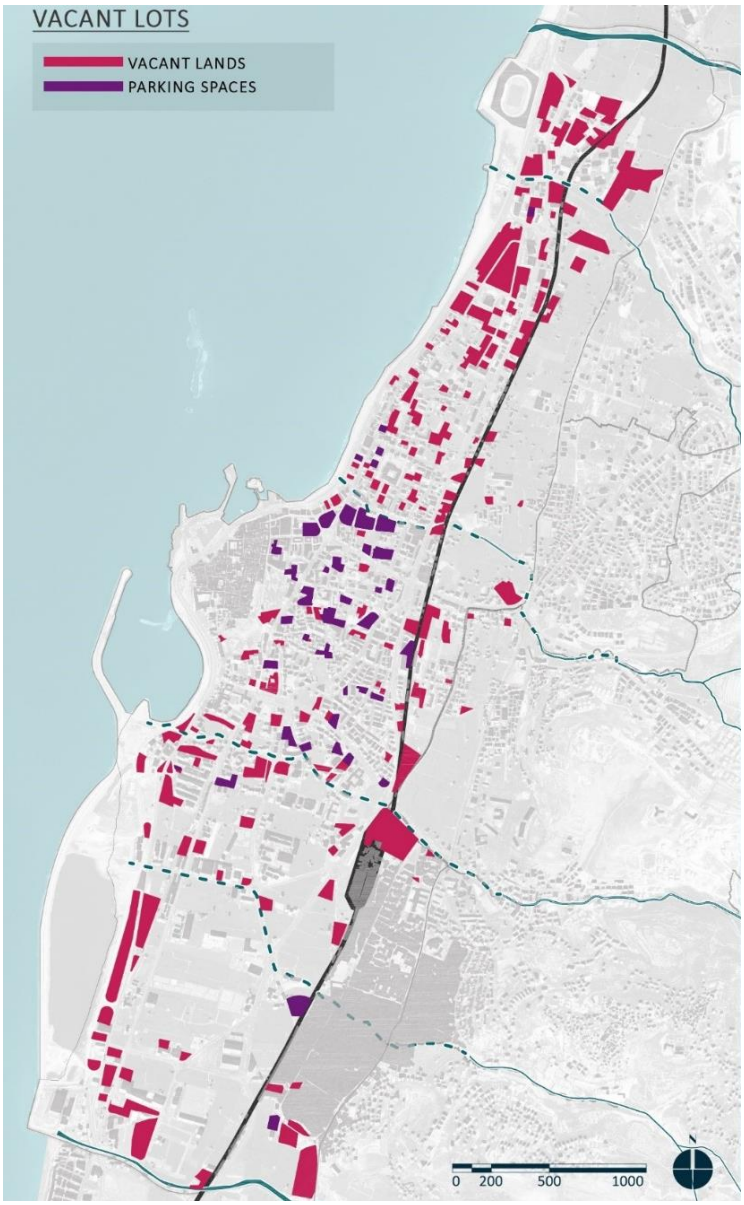


Figure 67: Saida vacant and parking lots. Source: Author

Saida still has many opportunity spaces for its numerous vacant and parking lots. Many of the residents of Saida live outside the administrative boundary of the city in search for an affordable housing on the adjacent hills. The construction activity around the city, mainly in Bqosta, is much more active than within the city administrative boundary. The moderate exploitation ratios and cheap lots, if compared to the city land prices, aided the rapid expansions on the city nearby hills. To add, the hillside has

opportunities for open vistas to the sea for its steep slope. This resulted in desired spaces for residence that lays within minutes from the city center.

Thus, the city can benefit from lots vacancy if a green strategy is to be adopted through different regulatory tools.

5. Agricultural Lots

Figure 68: Saida agricultural lots. Source: Produced by Author based on google earth 2018.

As explained before the agricultural lots are a major city asset with no law to preserve them. They represent a high percentage of the lots in the city, yet are urbanized in a fast pace.

6. Road Hierarchy

Figure 69: Saida Road Hierarchy. Source: Author

The road network in the city is related to the city historical evolution and the relation of the city to its larger context. The primary roads are mainly north- south connections as stated before. The intensity of road division is high at the city center and

at the north-west land pooling project. These areas present the main residential spaces in the city and are in primary need of enhancing the pedestrian experience within.

7. Public-Private Transportation Network

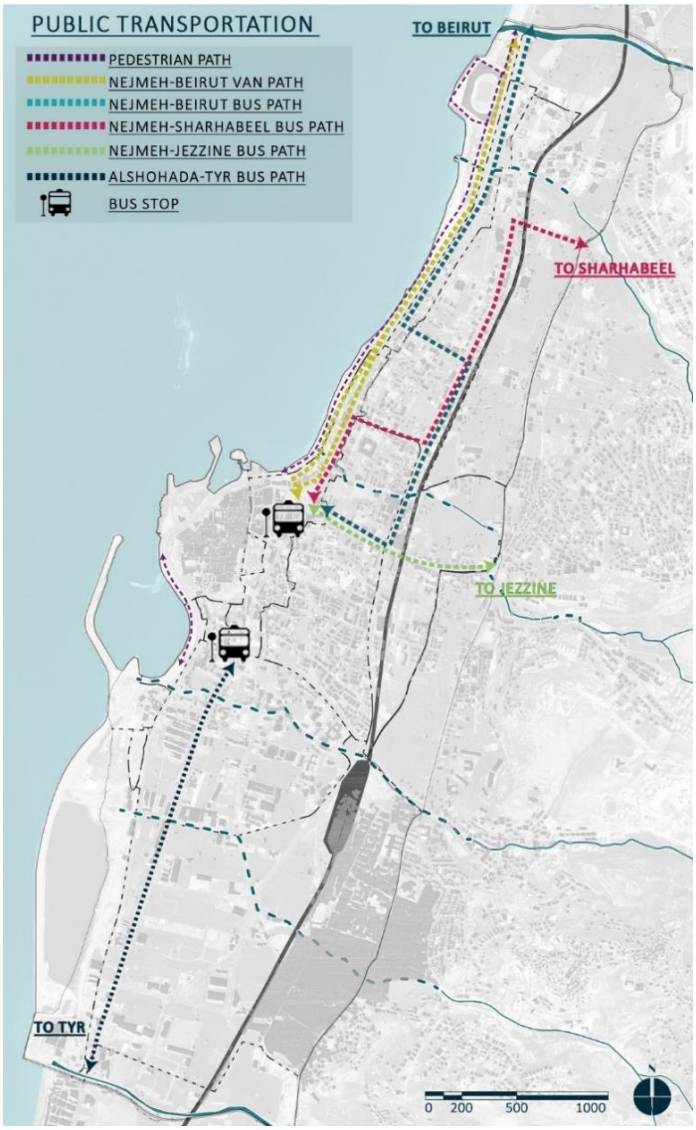


Figure 70: Saida public-private transportation network. Source: Author

Saida as other Lebanese cities lacks a public transportation network. The transportation in the city depends or private companies or individuals. “Al Sawi Zantout” and “the vans parking” are the main bus stations in the city. They are privately owned and managed. These stations connect the city with the capital, the south and in

the recent years to Jezzine and Bqosta (Sharhabeel). The transportations within the city administrative boundary depends on private vehicles or taxis. This resulted in high dependence on the private cars and consequently in the increase in car ownership. The vacant spaces when found are in many cases transformed into a parking lot. To add the streets congestion is increasing forming a rising problem in the city. If any green strategy is to be considered in the city, an effective public transportation network must be developed to decrease the private car usage in the city.

8. Sidewalks

Figure 71: Saida wide Sidewalks. Source: Author

The northern corniche is considered the main walking destination in the city. People use their cars to reach the shoreline and enjoy a walk along the beach. Then they use their cars to return back home. The sidewalks in the city are not consistent and *don't* offer a pleasant walk. They are not continuous and well maintained. Many use the sidewalk as a parking space for their vehicles. The car has the precedence along the roads and people depend on it in their movements. The sidewalk is not valued as a necessary network for pedestrian movements. While walking has many psychological

and physical benefits, it is considered merely a hobby. People don't embrace it in their daily routine for it is usually seen inferior to riding a car.

9. Character Map

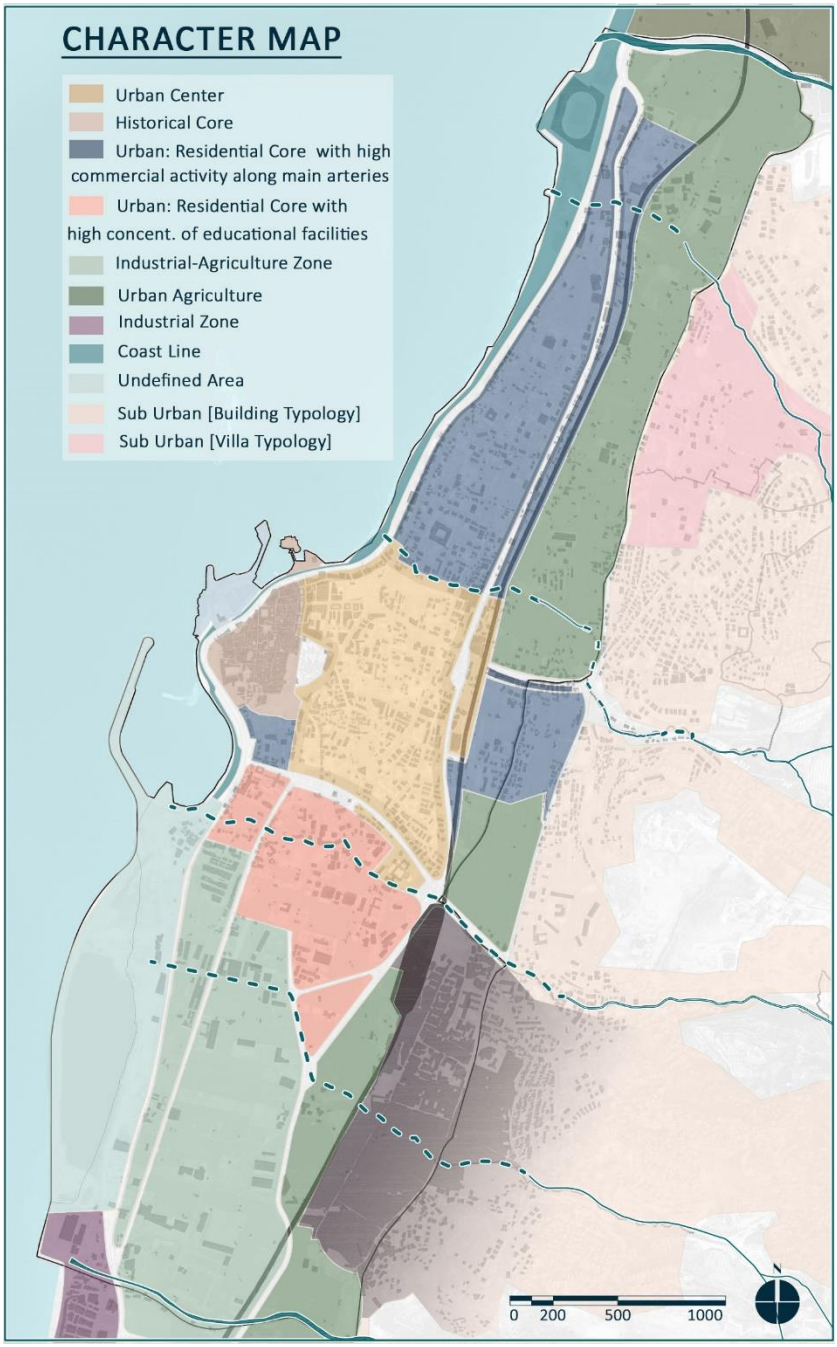


Figure 72: Character Zones derived from the city analysis and overlap with many of the USUDS defined zones. Source: Author

While the blue green network bisects the city in multiple spines it passes through different city character zones. Each path along the network holds a different character and must be treated accordingly.

C. Blue Green Network Analysis

After the general city analysis, this section presents a more detailed analysis along the rivers and the railroad. The analysis aims to better understand their current condition and to extract the opportunities and constrains of each. It ends with a general strategy to better address the city assets.

1. Rivers and Railroad Figure Ground Map

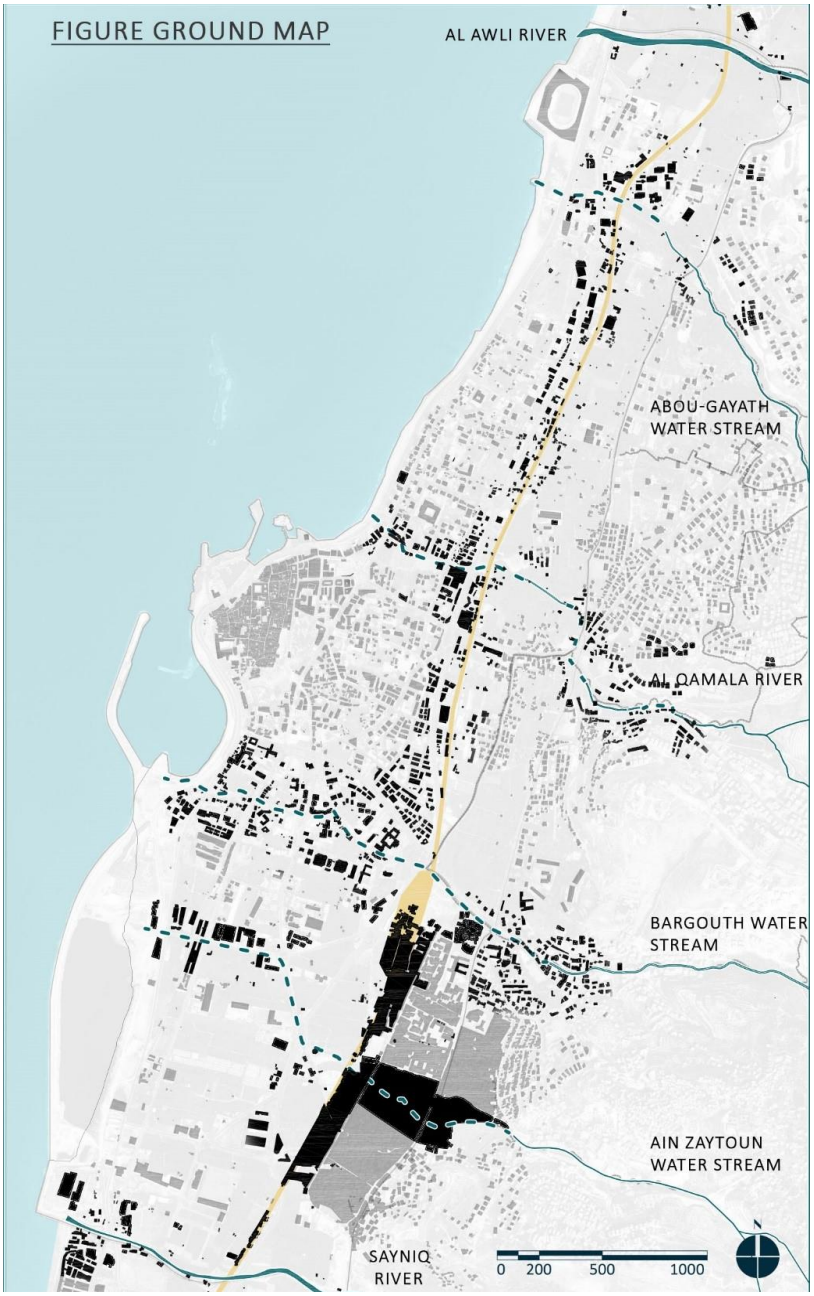


Figure 73: Figure ground map at rivers and railroad. Source: Author

The aim of the figure-ground map along the blue-green network is to highlight the concentration of the built-up environment around the linkages and the extent to which the network could be realized. The degree of concentration of the built-up area ranges from high density around the city core to low density as we move to the city

peripheries excluding the camp area. Ain El Hilweh camp is the densest area in the city. Many of the buildings within lack proper lighting and good ventilation. The camp doesn’t follow any formal law. Consequently, it represents the most problematical space in the city. Excluding this area, the map shows high potential of developing the network with high vacant areas along.

2. Land Use

a. Rivers Land Use

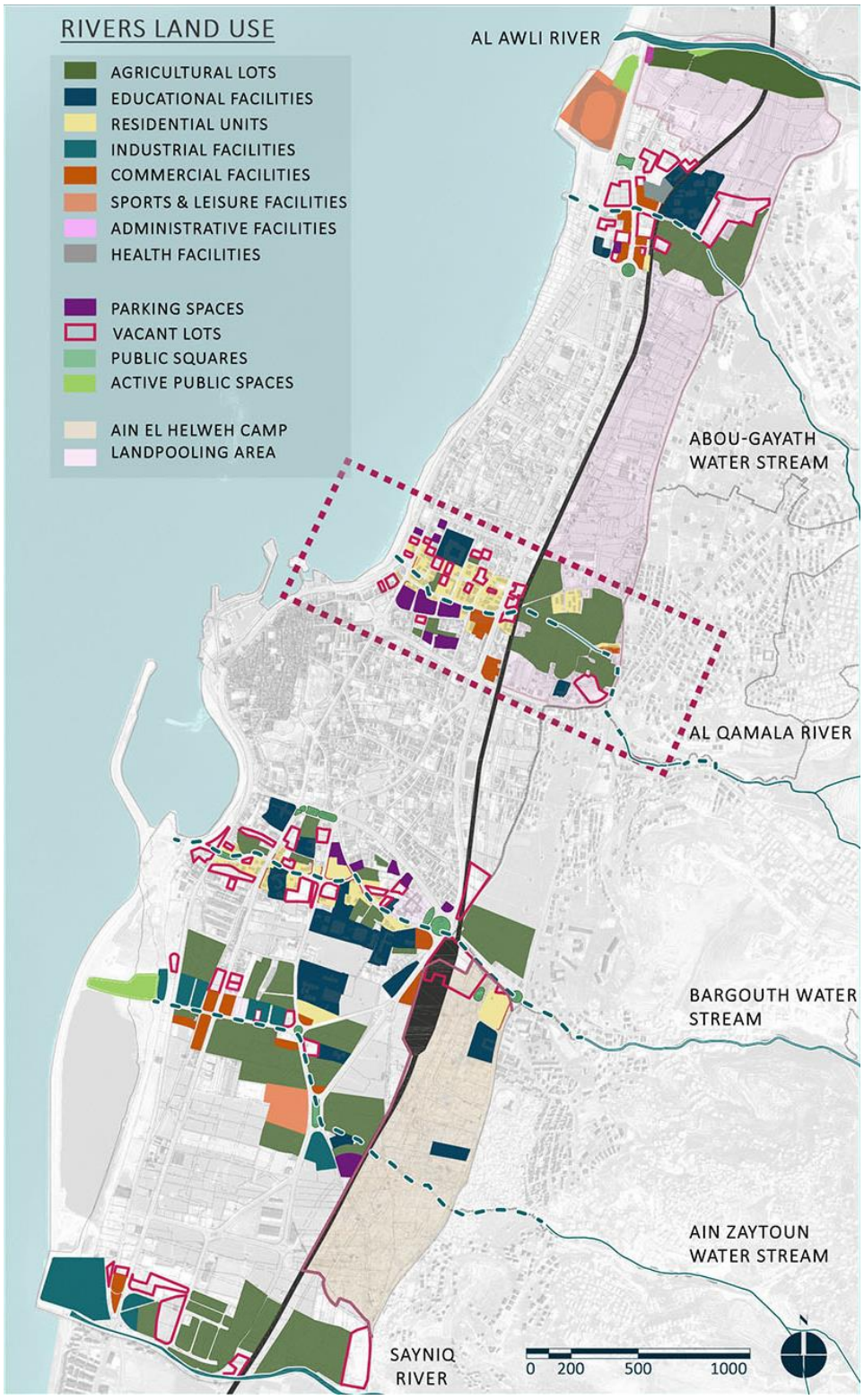


Figure 74: Rivers land use with the intervention area highlighted. Source: Author

b. Railroad Land Use

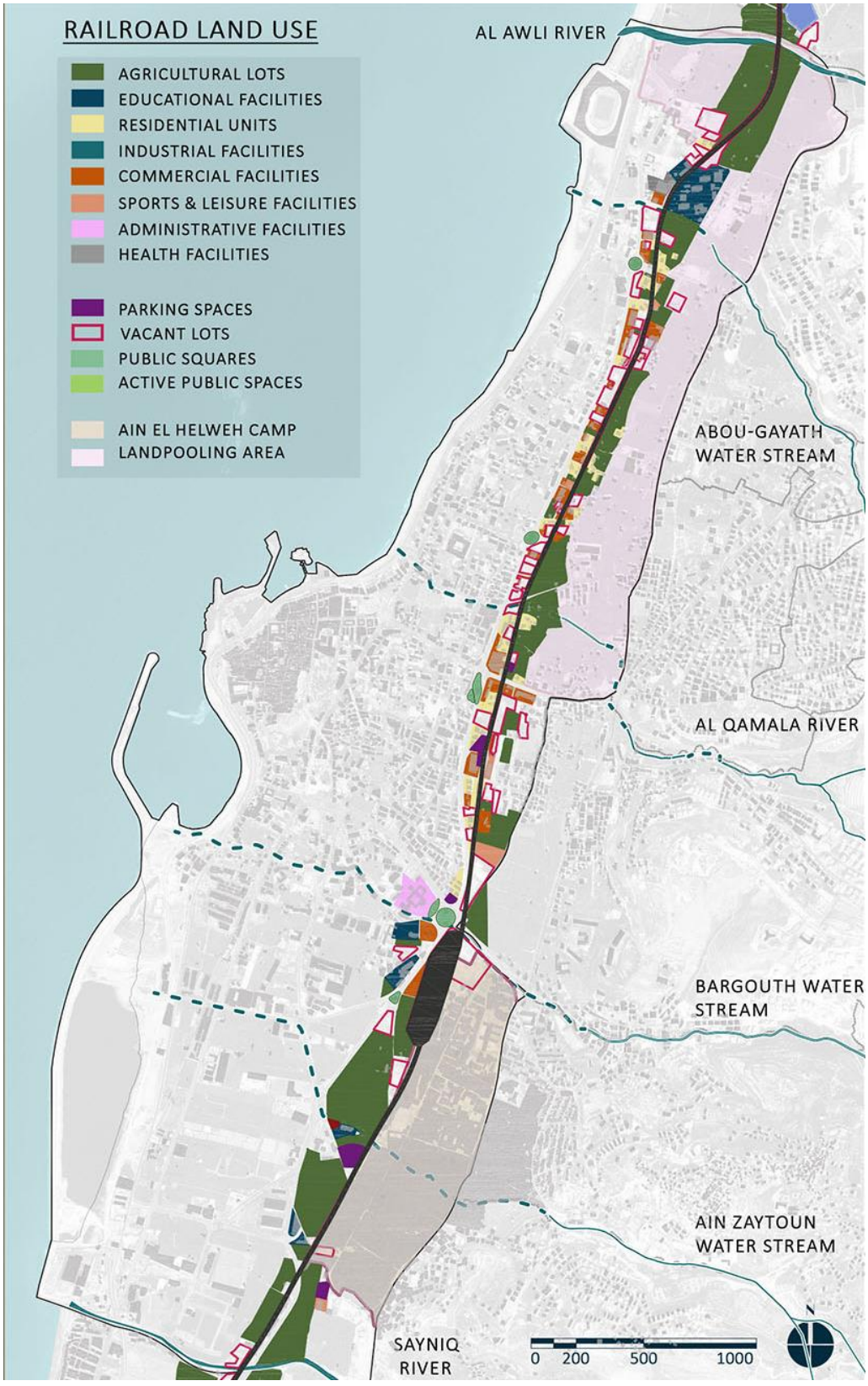


Figure 75: Railroad land use. Source: Author

Table 2: Rivers and railroad land use

	Land Use
Al Awali River	The area around the river is still undeveloped. It holds agriculture as its main land use. The river reaches the shoreline at a fragment of a public beach.
Abou Gayath Water Stream	The water stream flows through Bqosta (Sharhabeel), a residential area. It runs through the agricultural lots in the land pooling project to be. It continues through an under developed commercial area to reach the public beach.
Al Qamla Water Stream	The water stream flows through a developing commercial center at the Qaneye square. The square is a main branching point that connects the city to multiple eastern villages such as Qayaa, Abra, and Haret Saida. The water stream then runs through agricultural lots in the land pooling project to be then through a residential and commercial area to reach the public beach.
Bargouth Water Stream	The water stream flows through Al Fawar residential area. It runs along Ain El Helweh camp edge and an agricultural area, then continues through a mixed-use area with high concentration of educational facilities. It ends at an under-construction port.
Ain Zaytouneh	The water stream passes under the camp dense urban area. It then continues along the agricultural lots to reach a commercial-industrial area. It ends at an undefined landfill area. The landfill embraces the largest public garden in the city.

	Land Use
Sayniq River	Sayniq river flows through agricultural lots to reach a commercial-industrial area. It then flows along the main sewage treatment plan in the city to reach the sea.
Railroad	The railroad passes through agricultural lots at the south of the city, then it continues at the camp inner boundary. It passes parallel to the eastern boulevard through underdeveloped residential- commercial area to reach the land poling project to be. The railroad is situated at the western edge of the land pooling project. It is bounded by agricultural lots at its eastern boundary and commercial-residential area at it western boundary. After that it crosses the land pooling project through agricultural lots to cross over AL Awali River heading towards the capital.

3. River and Railroad Existing Condition

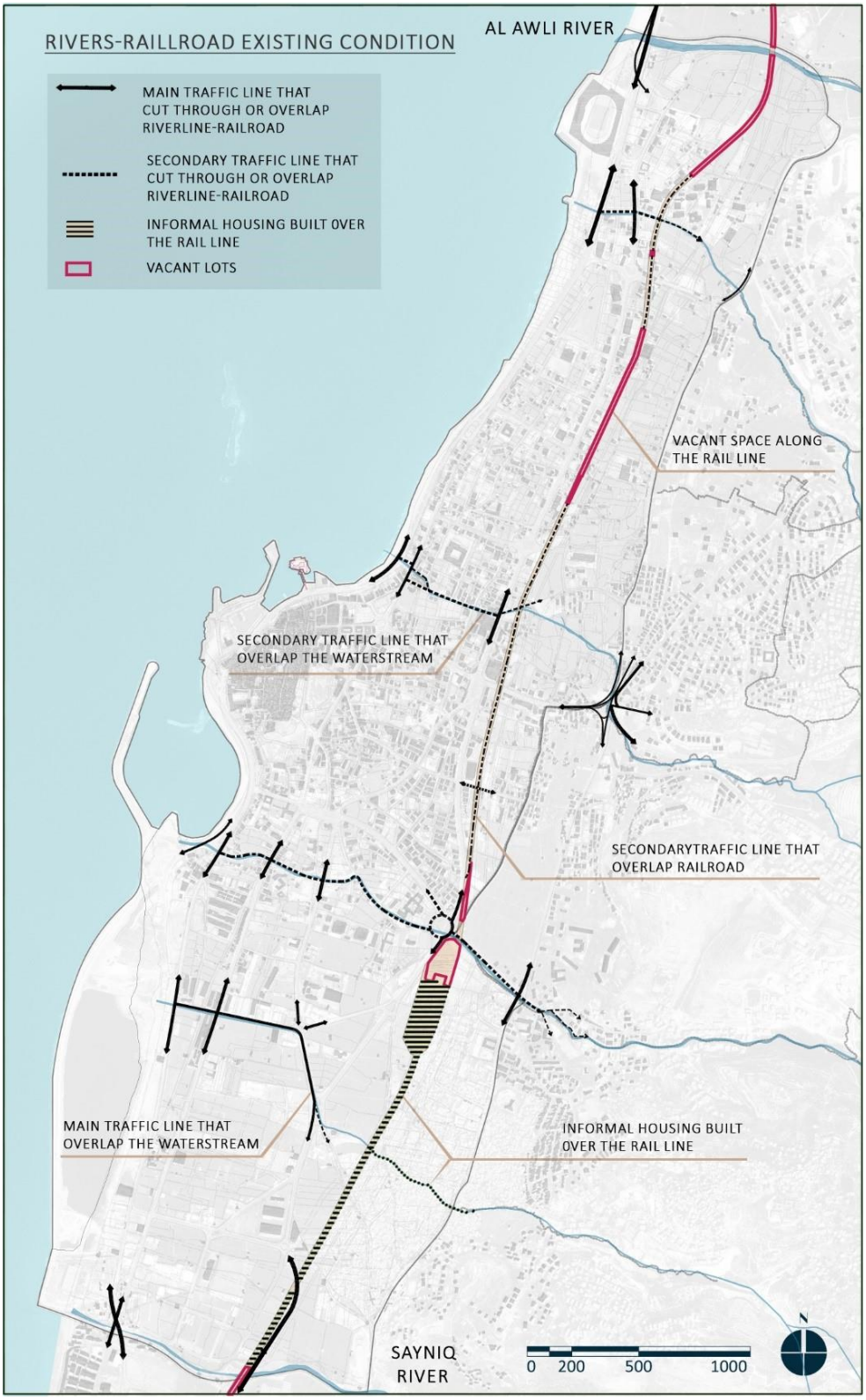


Figure 76: Rivers and railroad existing condition. Source: Author

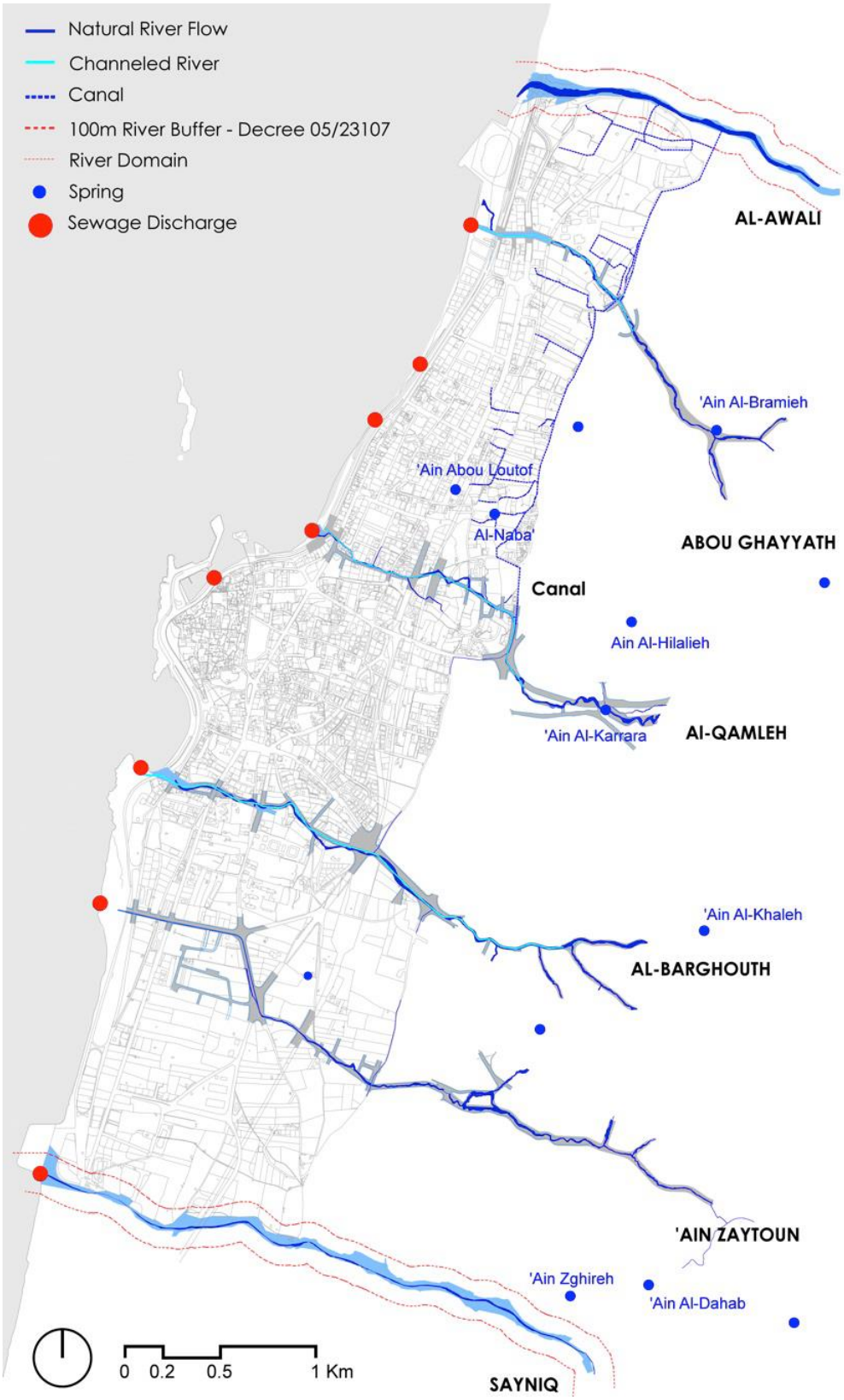


Figure 77: Rivers present flow condition. Source: Makhzoumi et al, 2014.

The main two rivers in the city are Sayniq and Al Awali. They lay at the city north and south boundaries and are the only naturally flowing rivers. The four other water streams are channeled. In the urban spaces, the four water streams are transformed into paved roads that became part of the grey infrastructural network where no trace for the water streams could be identified by the passerby. When questioning city residents about the water streams, many don't know about their existence.

The water streams form natural channels to flow from the hillside to the shoreline by gravity. The existing water paths, unfortunately, were the easiest way to use to discharge sewage water from the urban areas to the shoreline or to the treatment plant if found. The figure shows that all of the four water streams are nowadays part of the sewage network. The natural water flowing in the pipes is then polluted. For this reason, the whole water stream paths in the city are channeled including the part flowing in the agricultural areas. The residents complained about the bad smells and views of the exposed sewage drain. As a result, many culvert projects were executed to channel the water paths underground.

As for the rail road in the city, it can be classified into three categories based on its current condition. First, along the camp edge and the informal housing areas, where the traces of the railroad still exist with many built up encroachments over it. Second, in the urban areas, where it is mainly transformed into a paved road. Third, in the agricultural lots, where some of the traces of the railroad are still visible. The plan to embrace the railroad as part of the green-blue network can be applied. It needs effective regulations to preserve it as a green corridor. With the note that the camp area presents the hardest space to deal with, where no formal legislation is applied.

4. Rivers and Railroad Opportunities and Constrains

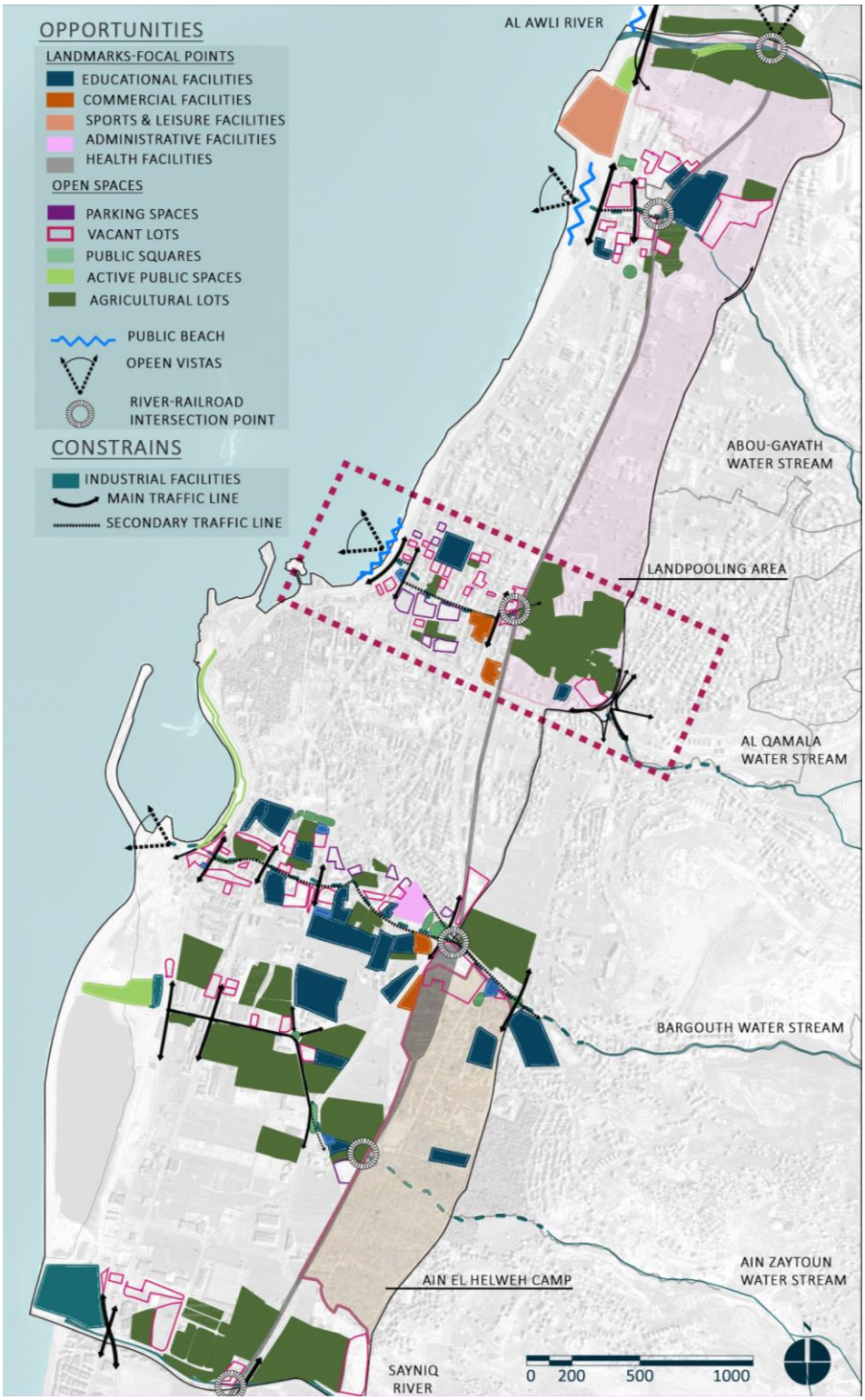


Figure 78: Rivers Opportunities and Constrains with the intervention area highlighted.

Source: Author

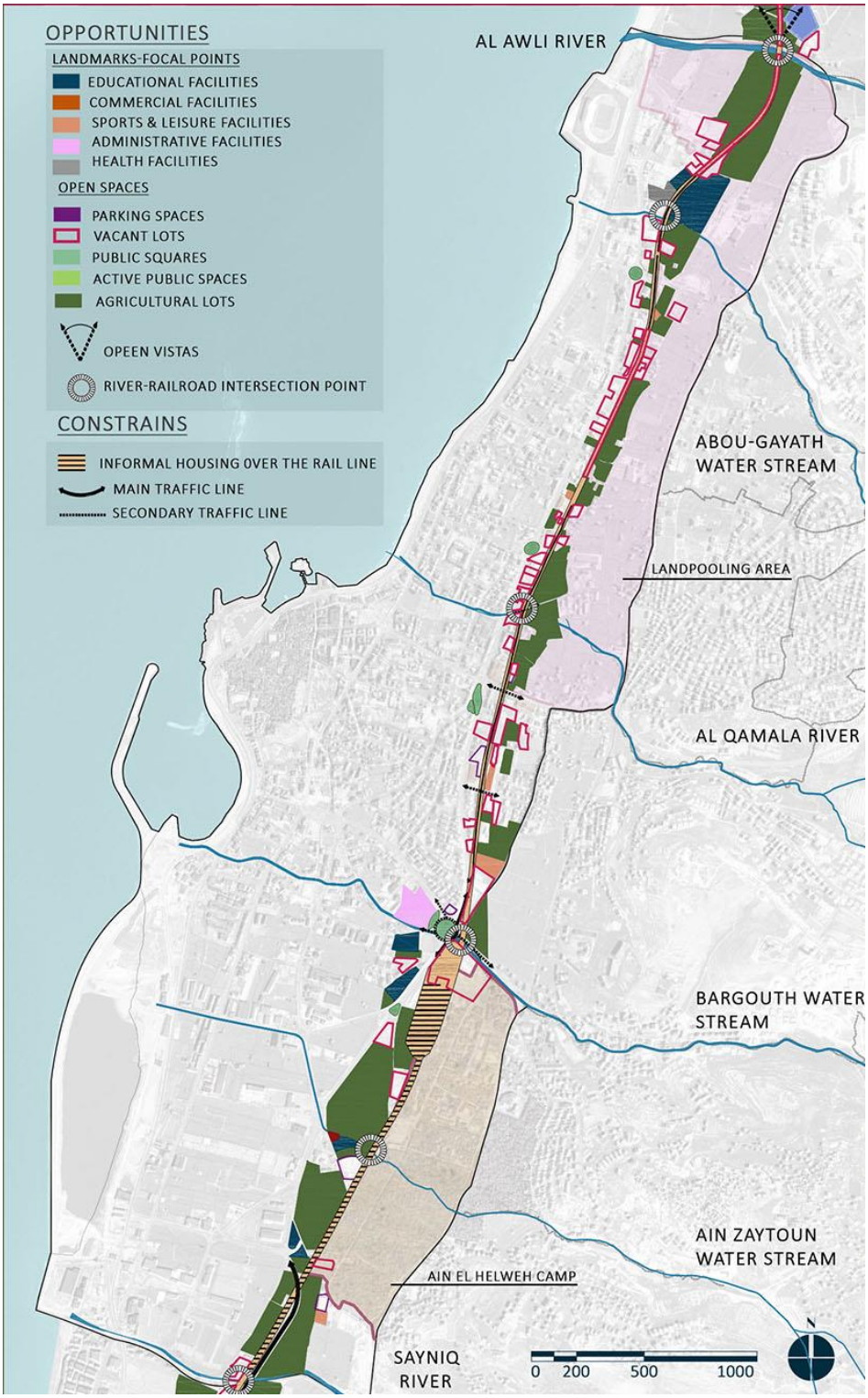


Figure 79: Railroad opportunities and constrains. Source: Author

Table 3: Rivers and railroad opportunities and constrains

	OPPORTUNITIES			CONSTRAINS
	Availability of vacant lots-Parking	Green Spaces	Attraction Points	
Al Awali River	Low	Agriculture as the main land use Two Public-Private Gardens	Achmoun Archeological Site Exposition Center Public-Private Gardens Municipal Stadium	Wide road network facilitating north-south vehicular connectivity Undefined Area: Land pooling area as an opportunity and a constrain
Abou Gayath Water Stream	High	Agriculture as minimal land use	Sharhabeel main entry point Educational and health facilities Public Beach	Wide road network facilitating north-south vehicular connectivity Undefined Area: Land pooling area as an opportunity and a constrain
Al Qamla Water Stream	High	Agriculture as a main land use	Main connection Juncture between Saida and eastern villages Commercial Facilities Educational Facility Public Beach	Wide road network facilitating north-south vehicular connectivity Undefined Area: Land pooling area as an opportunity and a constrain
Al Bargouth Water Stream	Moderate	Moderate Agricultural lots	Educational Facilities Administrative Facility Coastal Promenade	Wide road network facilitating north-south vehicular connectivity Camp as a security threat Socio-Economic Status Gap

	OPPORTUNITIES			CONSTRAINS
Ain Zaytoun Water Stream	High, considering the undefined land fill area	Agriculture as a main land use Municipal garden	Educational facilities Municipal Garden	Wide road network facilitating north-south vehicular connectivity Camp as a security threat Socio-Economic Status Gap Undefined land fill area as an opportunity and a constrain
Sayniq River	Low	Agriculture as a main land use	Ghazieh entry point Commercial Line	Wide road network facilitating north-south vehicular connectivity Main sewage treatment plant
Railroad	High	Agriculture as a main land use	Commercial Facilities Health Facilities Educational Facilities Exposition Center	Urban Encroachments (Camp and southern informal housing) Wide road arteries facilitating vehicular connectivity International road planned not yet executed Land pooling area as an opportunity and a constrain

5. General Green-Blue Network Strategy

Figure 80: General city strategy along water streams and the railroad. Source: Author

a. Al Awali River

Touristic spine: Enhance the connection between the Municipal Stadium, the historic site: Achmoun Temple, the exhibition center through the orchards.

Northern entry point: Enhance a more welcoming entrance to the city through vegetation.

- Preserve a green buffer zone (The agriculture lots) along the river stream.
- Sustain the orchards identity, yet enable visual connectivity.
- Define new touristic and commercial facilities along the river stream.
- Connect the river sides to enhance physical connectivity between green spaces
- Define a more welcoming public beach
- Define wide vegetated sidewalks with rest spaces along the river line.
- Provide wide setbacks to allow-preserve a vegetation strip and a pedestrian line connecting the zones.
- Revise planning- zoning regulations along river line. Ensure a wide setback-obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage
- Decrease the notion of physical disconnectivity along wide vehicular networks

b. Abou Gayath Water Stream

Residential-Educational Line: Connect Sharhabeel area (Residential District) and the educational and health facilities to the active Sea waterfront

- Preserve a green buffer zone (The agriculture lots) along the water stream. Sustain the orchards identity, yet enable visual connectivity.
- Define a more welcoming public beach

- Define wide vegetated sidewalks with rest spaces along the water stream

  Provide wide setbacks to allow-preserve a vegetation strip and a pedestrian line connecting zones. The water stream can be uncovered where possible.

  Introduce visually continuous landscape to connect the urban fabric using thematic greenery.

- Revise planning- zoning regulations along the water stream. Ensure a wide setback- obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage.
- Decrease the notion of physical disconnectivity along wide vehicular networks

c. Al Qamla Water Stream

Central Spine: Connect eastern districts (Hilaleyeh-Ayaah-Haret Saida) to the Sea waterfront, the old city, and Nijmeh square.

This spine makes a vital connection between Al Qaneye Square, a central point connecting the city to Qayaaa, Helaliyeh, and Haret Saida. It acts as a gate to many eastern villages to the city center. The spine ends at an active part of the seafront and in proximity to the main bus station that links the city to the south and north of the country. The spine ends also in proximity to the “Souq” and the city historic core.

- Enhance connectivity from commercial centers (Le Mall, Saida Mall and the local Souq to the trail through well maintained sidewalks- greenery – lighting.
- Enhance retail within a shopping street typology to activate street life along the water stream.
- Preserve agricultural lots along the river line. Sustain the orchards identity, yet enable visual connectivity.

- Define a more welcoming public beach
- Define wide vegetated sidewalks with rest spaces along the water stream
- Provide wide setbacks to allow-preserve a vegetation strip and a pedestrian line connecting the zones. The water stream can be uncovered along the new setback.
- Introduce visually continuous landscape to connect the urban fabric using thematic greenery.
- Revise planning- zoning regulations along the water stream. Ensure a wide setback- obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage.
- Decrease the notion of physical disconnectivity along wide vehicular networks

d. Bargouth water stream

Touristic-Educational Spine: The water stream connects the new commercial port with multiple educational institutes.

- Define a welcoming gate point from the touristic port to the green trail
- Define open spaces and activity zones that can serve the educational facilities along the trail: playgrounds, cafes, studying spaces, library
- Connect the educational facilities to the trail: Enhancing walkability and maintaining sidewalks light - greening the sidewalk
- Define wide vegetated sidewalks with rest spaces along the water stream
- Provide wide setbacks to allow-preserve a vegetation strip and a pedestrian line connecting the zones. The water stream can be uncovered where possible.
- Introduce visually continuous landscape to connect the urban fabric using thematic greenery.

- Revise planning- zoning regulations along the water stream. Ensure a wide setback- obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage.
- Decrease the notion of physical disconnectivity along wide vehicular networks

e. Ein Zaytoun Water Stream

Residential- Agriculture Spine: The river line connects the municipal garden to Ein El Helweh Camp passing through multiple agricultural lots.

- Relocate the industrial activity away from the river line and the municipal garden to provide a more welcoming space, free of industrial noise and pollution
- Based on Nahr El Bared Camp experience, a percentage from each house could be deducted to create an urban breathing spaces in the dense fabric. The housing typology presents an unhealthy space for living. The open space is an urgent need in the camp.
- Define wide vegetated sidewalks with rest spaces along the water stream and ensure facilities that activate the water stream and serve for its primary users: camp residents such as restaurants and coffee shops.
- Provide wide setbacks to allow-preserve a vegetation strip and a pedestrian line connecting the zones. The water stream can be uncovered along the new setback.
- Introduce visually continuous landscape to connect the urban fabric using thematic greenery.
- Revise planning- zoning regulations along the water stream. Ensure a wide setback- obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage.

- Decrease the notion of physical disconnectivity along wide vehicular networks

f. Sayniq River

Green Lung: Green area within an industrial zone

Southern Entry point: Enhance a more welcoming entrance to the city through vegetation. The river can act as a green corridor giving accessibility to pedestrians along infrastructural breaks. The zone character is industrial, the aim is to enhance the area aesthetic and create a green lung within.

- Preserve a green buffer zone (The agriculture lots) along the river stream. Sustain the orchards identity, yet enable visual connectivity.
- Revise planning- zoning regulations along river line. Ensure a wide setback- obligatory planting.
- Ensure adequate parking spaces near the river line to facilitate its usage
- Decrease the notion of physical disconnectivity along wide vehicular networks and enhance natural connectivity under infrastructural breaks.

g. The Railroad

Green North-South Linkage: The rail road connects the city from Al Awali River in the North to Sayniq River in the south.

- Revise planning- zoning regulations along the railroad line. Ensure a wide setback- obligatory planting.
- Define wide vegetated sidewalks with rest spaces along the railroad
- Ensure adequate parking spaces near the railroad line to facilitate its usage

- Introduce visually continuous landscape to connect the urban fabric using thematic greenery
- Introduce two bike lanes to encourage an alternative mode of transportation.
- Remove infringements along the railroad to make it accessible.
- Introduce public transportation: Add an underground train lane along the public lots of the railroad to connect the city with its surroundings.
- Preserve the agriculture lots where possible. Sustain the orchards identity, and enable visual connectivity.

The strategies presented for the water streams and the railroad introduce a general framework. It is further developed through a proposed intervention area at the central spine, Al Qamla water stream.

D. Intervention at Al Qamla Water Stream

The Qamla water stream is not the most significant water stream in the city, yet its importance is derived from its proximity to the urban core. It feeds from at least 6 springs that keeps it flowing even in summer. In winter, it acts as a natural discharge for rain water. The water stream public domain reaches 67,000 square meters in Saida and its surrounding villages. This presents an opportunity to utilize these areas as a public space in the city and consider pedestrian connectivity along (Lilmadina Initiative, 2017). The water stream that was historically a gathering space is channeled in the urbanized areas under grey infrastructure. It is polluted for being part of the sewage network in the city today (Lilmadina Initiative, 2017).

Figure 81: The historical path of the Qamla water stream highlighted in blue where the dotted line shows the parallel main vehicular artery between the city and its hinterland. Photo Credit: Mohammad Hariri, 2017. Photo Edit: Author.

1. AL Qamla Character Zones

The channeled water stream flows from the city hillside passing through Al Qaneye Square. The square is a main round about that connects the city with multiple hillside urban expansions. It then continues through the under-study land pooling project. There is a large debate on preserving some of the city assets in the project or taking the short and easy solutions by totally urbanizing the area. It is also worth noting that the USUDS report rejected the project for it will erase Saida distinctive landscape and it is not based on a greater vision for the city (Al Harithy et al., 2014).

The water stream then flows in the city urban expansions in close proximity to the city center and passes next to oldest neighborhood along Al Qamla water stream, and which is named after it. The neighborhood has buildings that are 200 years old. Yet the Qamla neighborhood is totally neglected and the poor inhabitants are suffering from its deteriorated condition (Dahshe, 2010). It is identified for its historical value by the USUDS report, yet no law preserves its existence.

The water stream ends at an active part of the public beach that still needs enhancement. The Barcelona proposal set a new vision for the waterfront and it has not been executed till the date and no implementation is seen on the horizon.

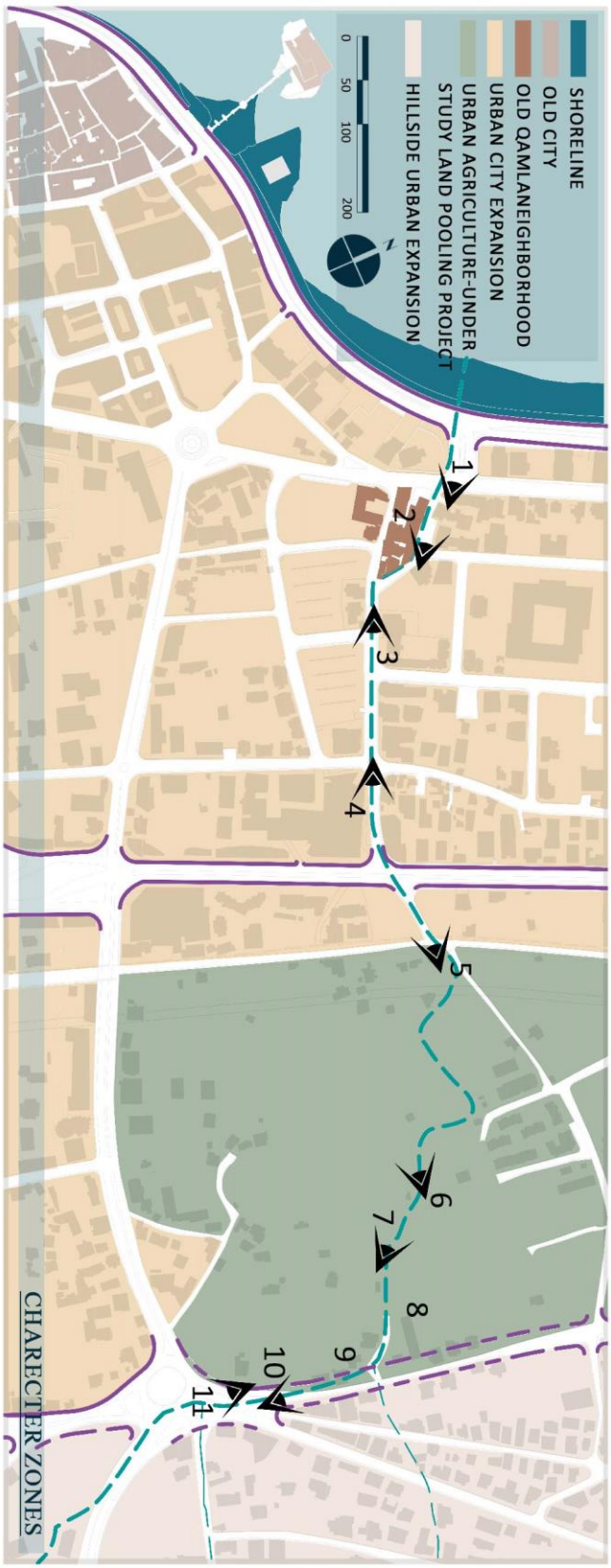


Figure 82: Al Qamla character zones. Source: Author.

Figure 83: Al Qamla Character zones pictures. Source: Author

Table 4: Al Qamla character zones

	Slope	Architecture	Spatial Enclosure	Land Use	Land Cover
Shoreline	Soft	Unbuilt	The combination of wide street network along the shoreline creates a weak sense of enclosure	Leisure and Sports	Sand: High Permeability
Old City	Soft	Heritage: A distinctive feature in the city. It is a very dense urban fabric with no green spaces	The combination of narrow walkways with low rise buildings create a high sense of enclosure	Mixed Use: Residential and Commercial	Developed urban area: Low permeability
Urban City Expansions	Soft	The majority of the built-up area are recent typical generic medium rise buildings. They are real estate developments that hold placeless design. The area holds medium to high density developments with low percentage of land vacancy and minimal green spaces	The combination of medium roads with medium rise buildings create a moderate sense of street enclosure	Mixed Use: Residential and Commercial	Developed urban area: Low permeability
Qamla Old Neighborhood	Soft	The first neighborhood along Al Qamla water Stream area with dense low-rise buildings and different architectural character.	The combination of narrow walkway with low rise buildings create a high sense of enclosure	Mixed Use: Residential and Commercial	Developed urban area: Low permeability

	Slope	Architecture	Spatial Enclosure	Land Use	Land Cover
Urban Agriculture - Under study land	Soft	Medium to low rise buildings in small scattered residential neighborhoods with different architectural character and age groups	The trees create a high sense of enclosure for the passerby	Agriculture-Undefined	Agriculture: High Permeability
Hillside urban expansion	Steep	The majority of the built-up area are recent typical generic low to medium rise buildings. They are real estate developments that hold placeless design. The area holds medium to high density developments with low percentage of land vacancy and minimal green spaces	The combination of medium roads with medium rise buildings create a moderate sense of street enclosure	Mixed Use: Residential and Commercial	Developed urban area: Low permeability

2. AL Qamla Land Use

Al Qamla water stream flows through mixed used areas of commercial and residential land use and through the undefined land pooling project to be.

Figure 84: Al Qamla land use. Source: Author.

3. Al Qamla Attraction Points

The viability of Al Qamla water stream path arrives from its location. It flows in parallel to the key vehicular artery that links Saida to its larger context. The water stream is in close proximity to Saida center, the municipality, the Souq, the main bus station, and the old city which are the main attraction points in the city. It presents an opportunity to develop a pedestrian friendly path with many vacant and agricultural lots along and its connection to the public beach. It passes next to one of the two main commercial malls in the city. At the fringe of the city, the Qamla water stream reaches AL Qaneye Square where two new commercial centers will be developed, one of which is currently under construction.

To note, the Qamla neighborhood is not an existing attraction point and is not valued by the city residence for its poor condition. It can be renovated and activated to highlight its value. To add, the stream limit is a public property within the agricultural lots. The boundary of the water stream could be used to create a main open space in the land pooling project to be, as the proposal of Habib Debs suggested (unpublished map). The undefined area to be presents an opportunity to respect the city assets and highlight their existence. Yet, this proposal is hardly on the table.

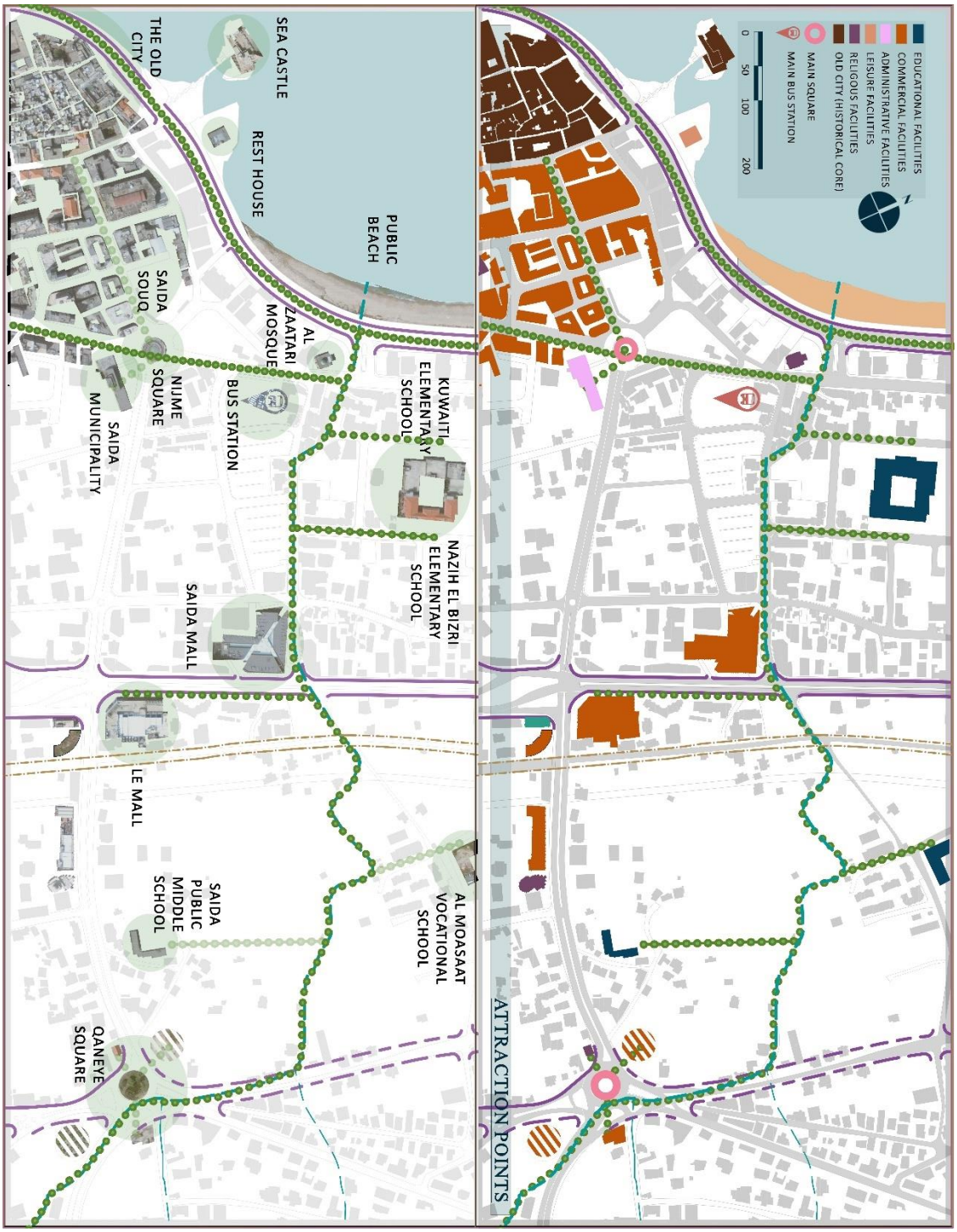


Figure 85: Al Qamla attraction points. Source: Author

4. Al Qamla Zoning

The water stream passes through different zoning divisions. In comparison to the city of Saida, the shoreline, zone B, has a high exploitation ratio of 2.4. Then through

zone C having the highest exploitation ratio of 4.2 in the city with no height limitation that could reach more than 10 floors. Zone E and F have low exploitation ratio, yet they are entitled to increase in the land pooling project. In the city upper hills, the exploitation ratio is medium with no more than four upper floors are allowed. The general zoning layout shown could be defined in a more detailed manner to enhance the public sphere and the pedestrian activity along the water path.

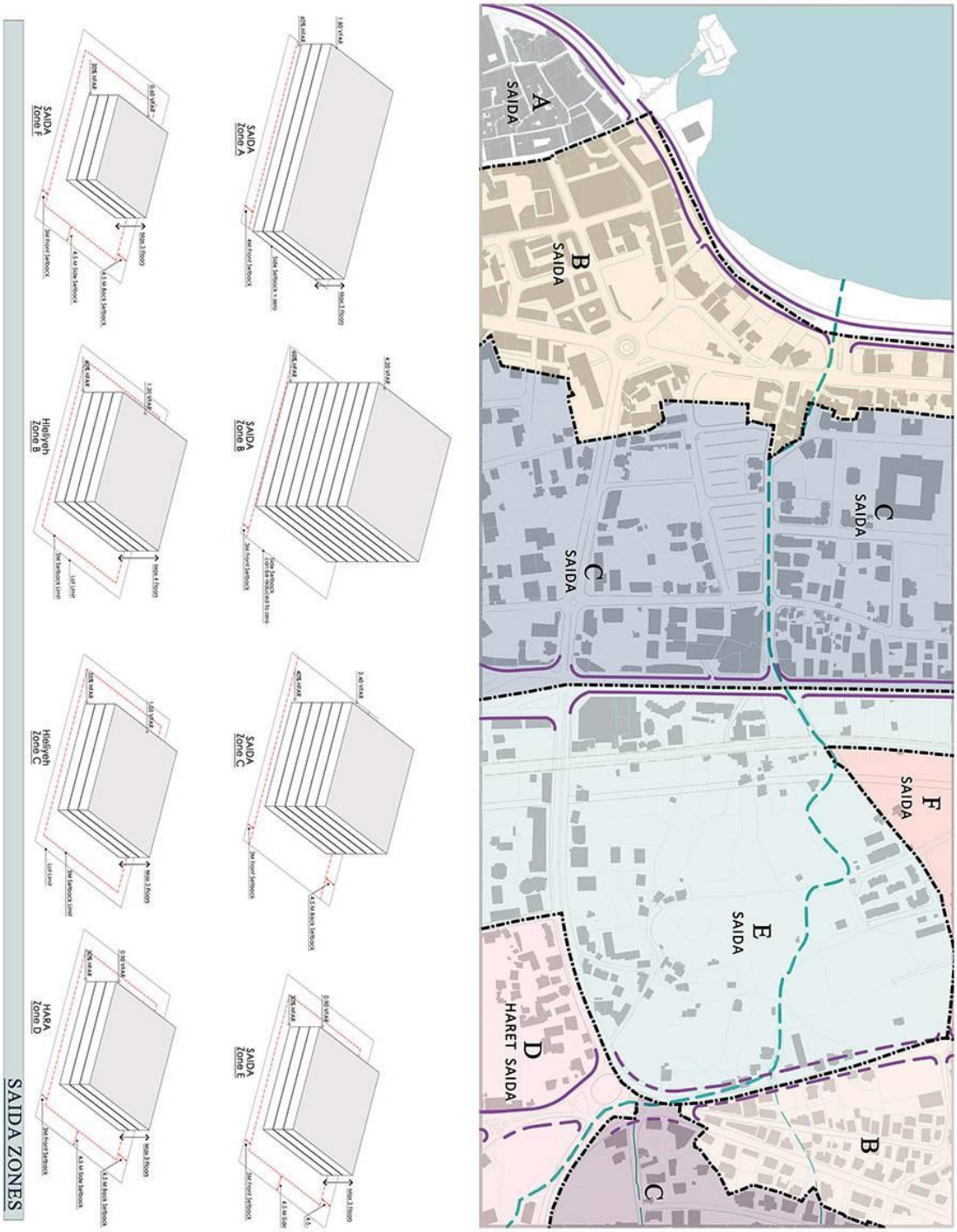


Figure 86: Al Qamla Zoning scheme. Source: Author

5. Al Qamla Road Hierarchy

The water stream flows from Al Shamma Highway, a primary road that connects the city to the eastern villages, reaches Al Qaneye square, a central roundabout, and

continues along Al Sultaneye road. The Sultaneye road is a tertiary road that got a degree to be widened into an expressway. In the land pooling area, the water stream runs under the agricultural lots for it is combined with sewage water and can't be used for irrigation if needed. Then, the water stream is channeled under a tertiary road in the city. It bisected by the eastern boulevard, a primary road that bisects the city inner fabric, and the coastal boulevard, a primary road that disconnects the city from the shoreline. The dominance of vehicular network in the city requires an approach to reclaim the ignored pedestrian sphere in the city and to decrease the notion of physical disconnectivity caused by the car circulation.

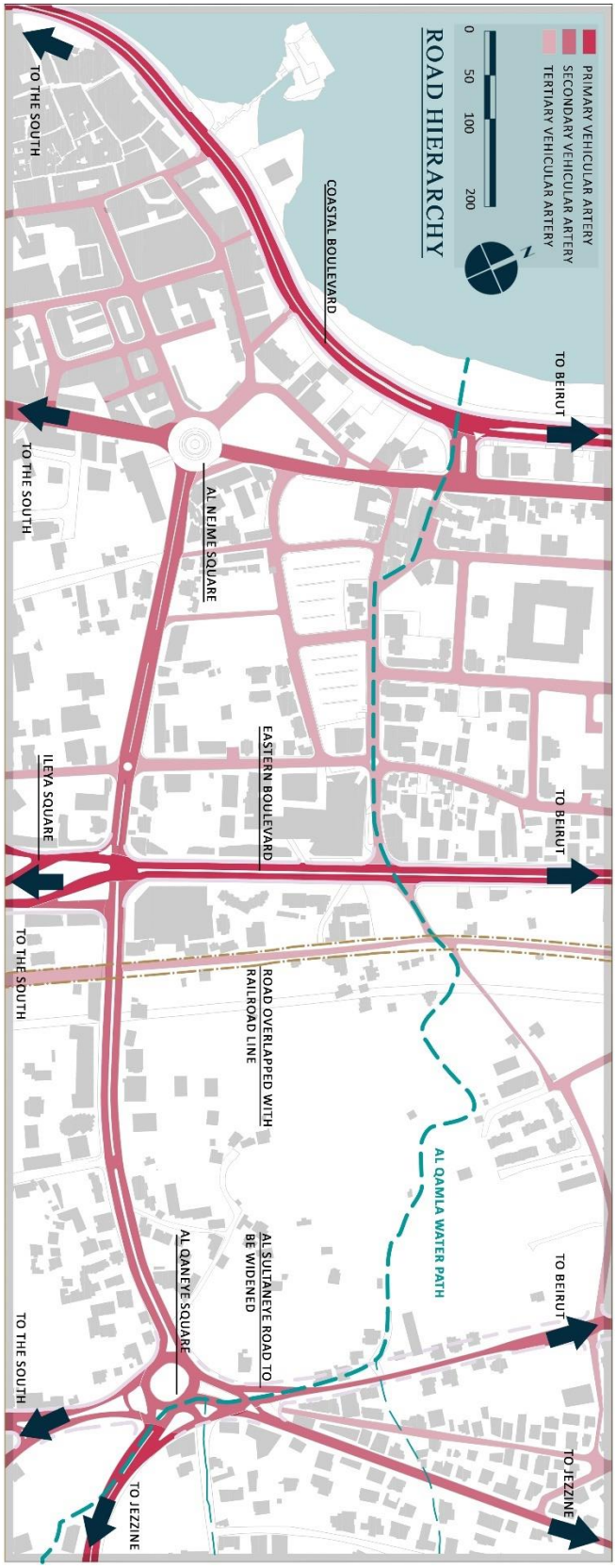


Figure 87: Al Qamla road hierarchy. Source: Author

6. Al Qamla Permeability

The permeability is mainly related to the lots land use. Unbuilt lots are fenced by a wall. Whereas, the buildings initiated in the recent time are typical residential blocks with commercial ground floor. They activate the street life within the neighborhoods. The mall has fixed glass facades to present the goods for the passerby, yet has limited access points and connections with the street.

In the land pooling area, the official limits of the water stream are public property. Yet, it is bounded by private lots and occupied by their owners. It is totally disconnected from the urban sphere and is not accessible for the public. The permeability has to be improved and spaces must be accessible to create a strong continuous public realm along the path.

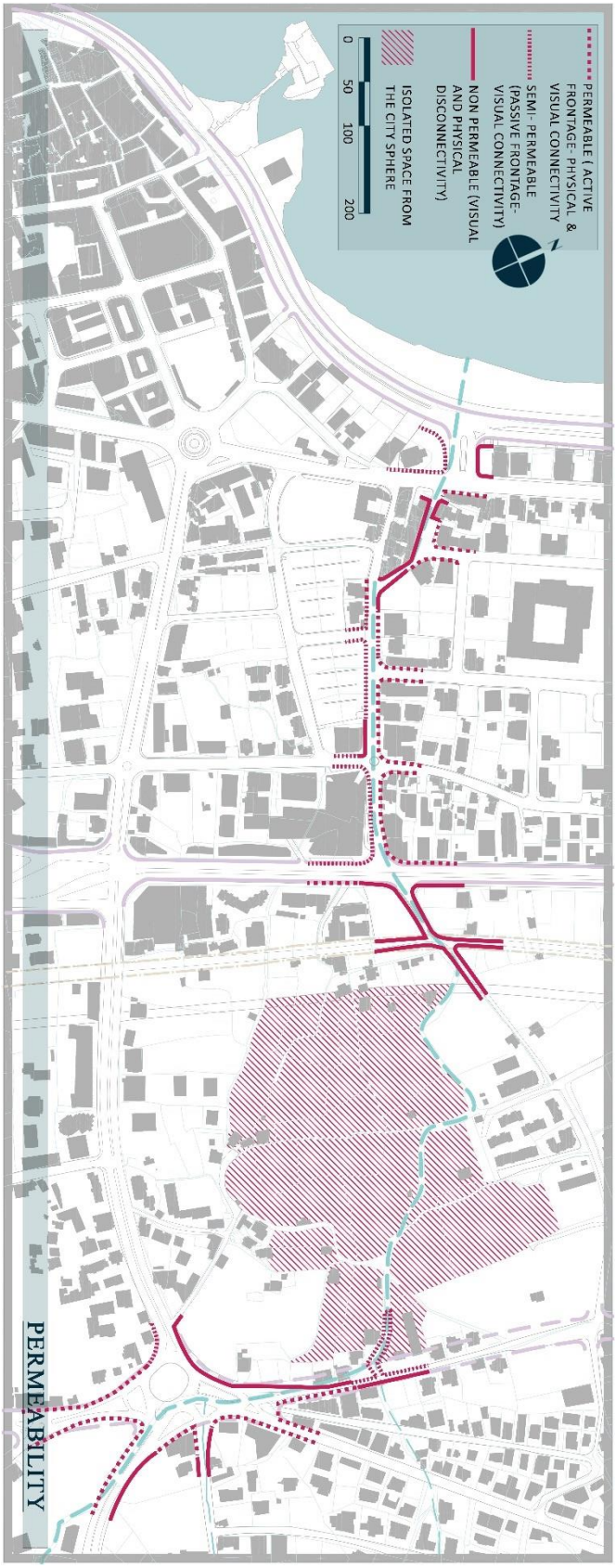


Figure 88: Al Qamla Permeability. Source: Author

7. Al Qamla Opportunities and Constrains

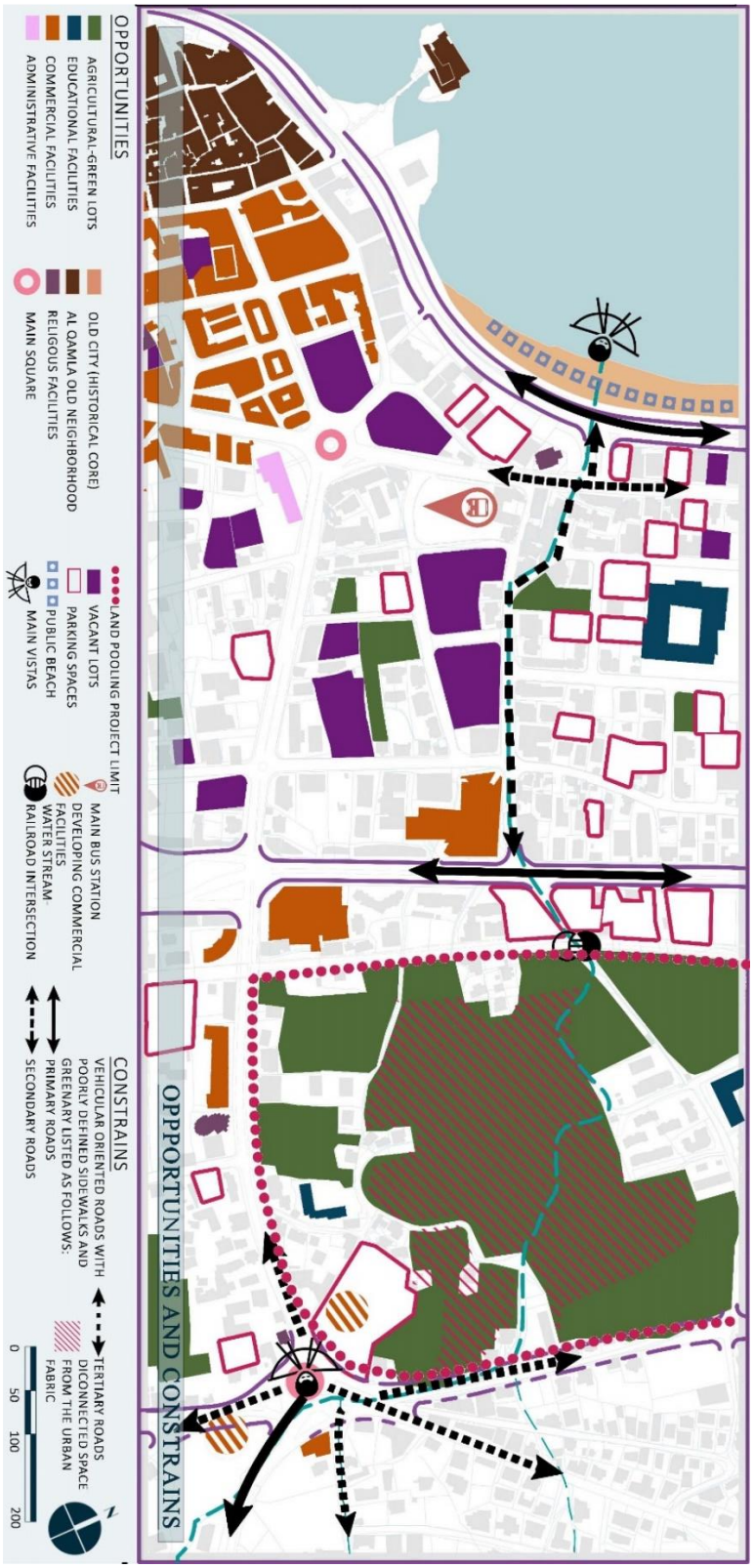
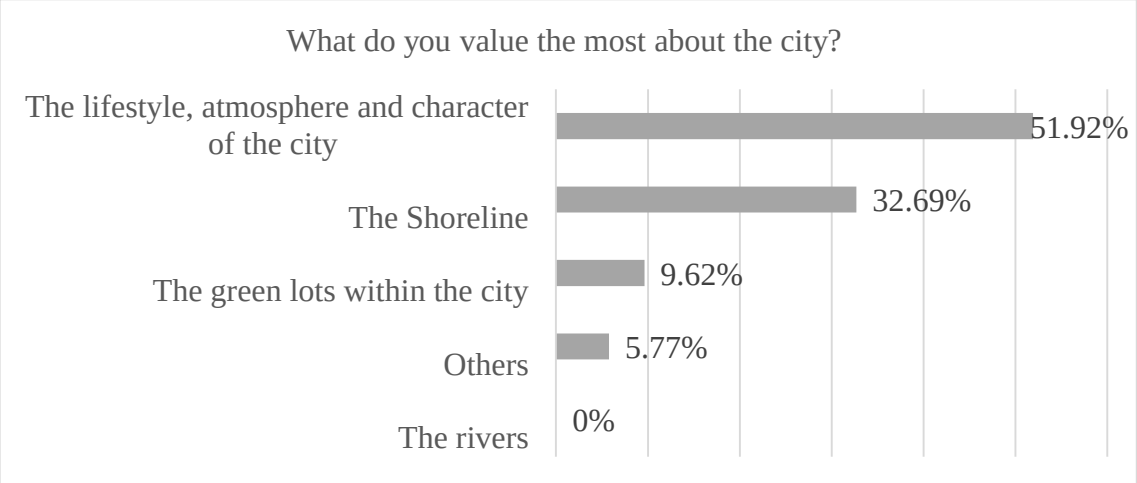


Figure 89: Al Qamla water stream opportunities and constrains. Source: Author

E. Residents' Questionnaire

Before suggesting a strategy, it is important to integrate people's opinions in the design approach. The questionnaire aims to better understand Saida residents' viewpoints through direct questions about modes of transportation and green and blue assets in the city. The questionnaire was answered by **52** individuals through an online survey. Around 90% have been living in Saida for more than ten years. Out of the 52 persons, 16 are from administrative Saida and 34 are from Greater Saida. They were randomly chosen from multiple age groups. The number that answered the survey is divided as follows: 24 persons are between 15-30 years, 17 are between 30-45 years and 5 are between 45-60 years. The results of the questionnaire are shown in the tables below.

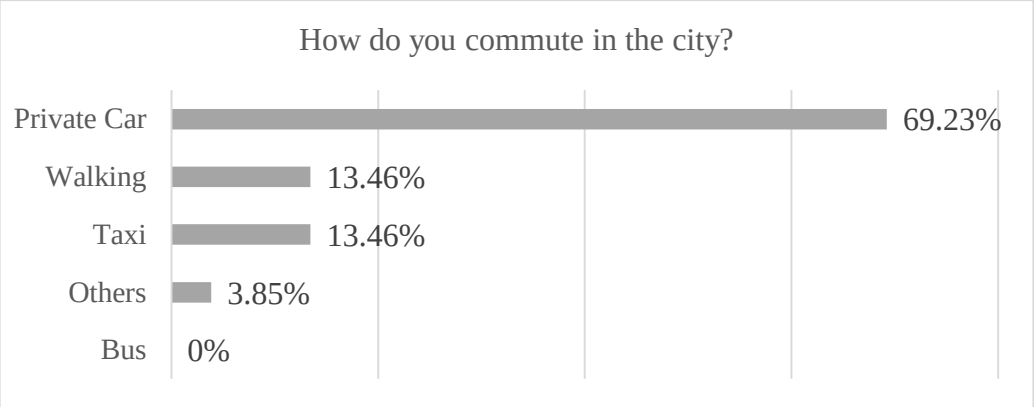
Table 5: Participants valuing the city assets



The degree to which the city residents value the city assets is related to their accessibility to them. While the shoreline is the main open space in the city, the rivers are bounded spaces. They are either surrounded by private properties or are channeled underground and have no visible trace in the city. Also, the green lots are private spaces

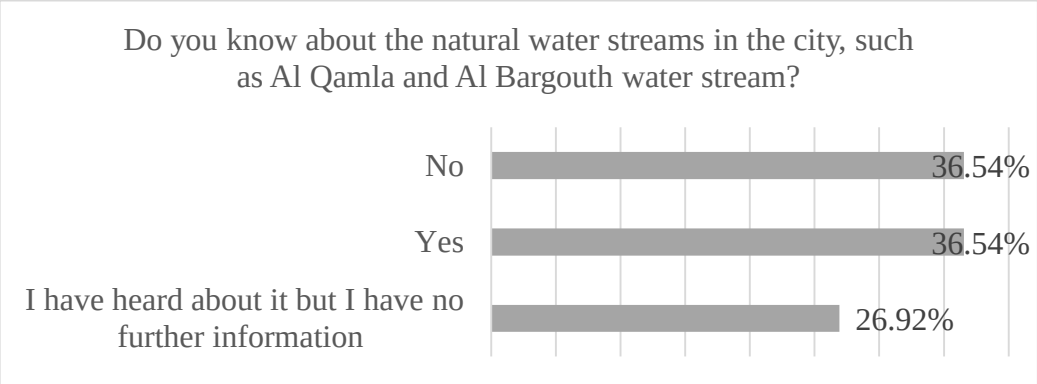
that are visually and physically disconnected from the city sphere.

Table 6: Modes of transportation



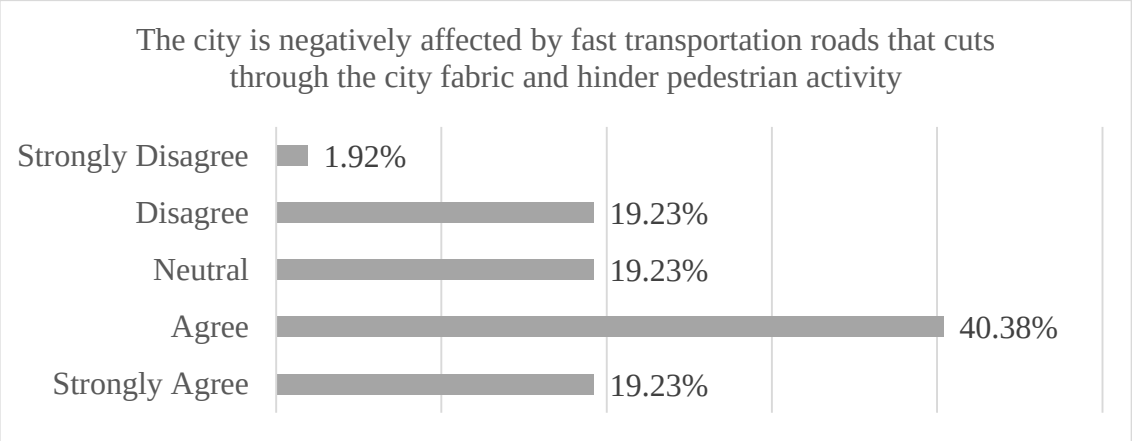
The city residents mainly depend on their private vehicles in their daily routine. The *walkability culture* is weak in the city with no programs to enhance it. In addition, there is no public transportation network in the city.

Table 7: Participants knowledge about Saida water streams



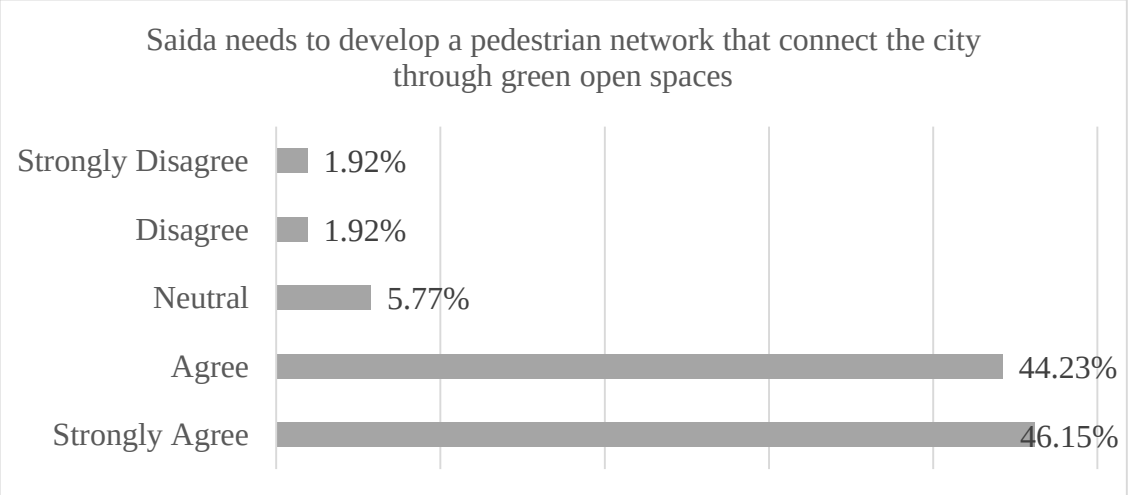
Many of the city residents don't know about the existence of the water streams in Saida for the latter have no natural flow area in the city and are buried underground. Their visible release points at the shoreline are for discharging sewage waste water that is mixed with natural water.

Table 8: Participants opinion regarding the effects of vehicular arteries on the urban city sphere



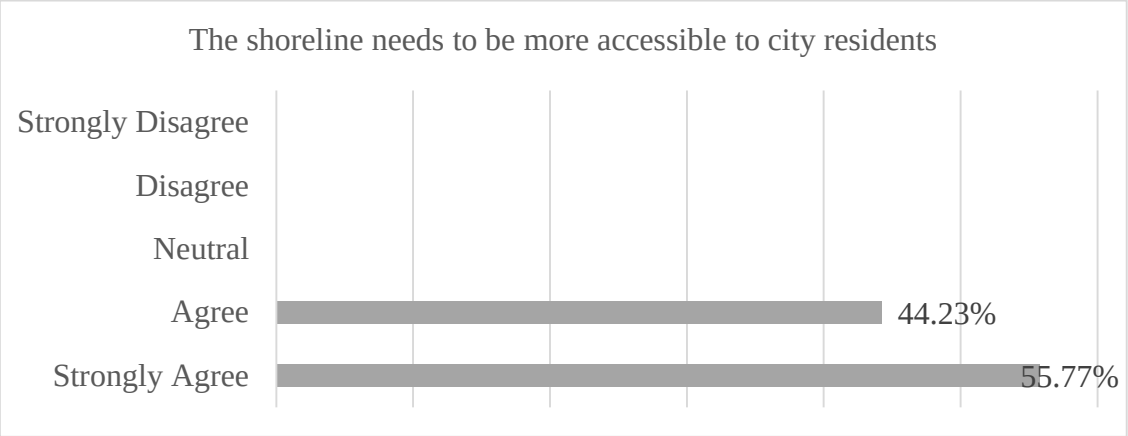
Around 60% of the participants agree on the negative effects of vehicular arteries on the urban city sphere. This is consistent with the thesis hypothesis and stresses the need to address this issue.

Table 9: Participants opinion about the walkability experience in the city



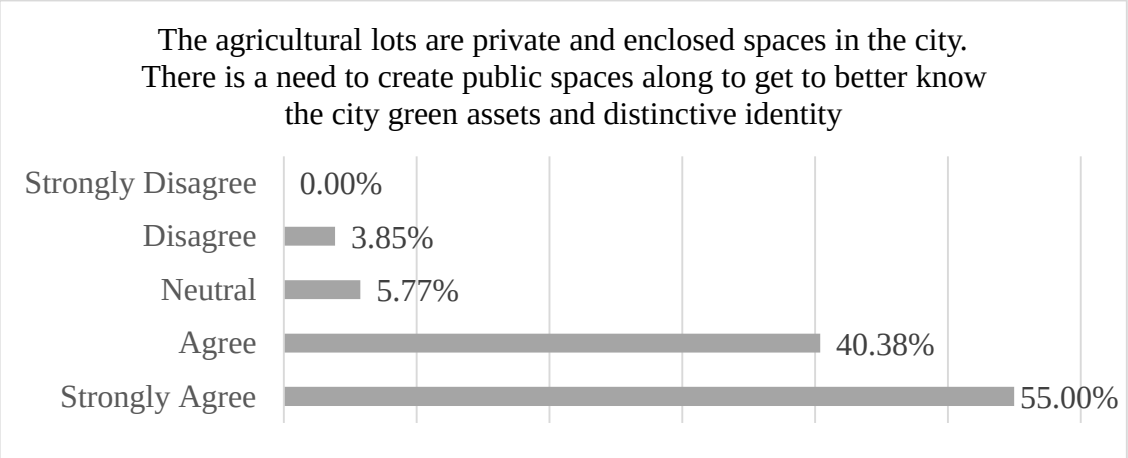
Participants highly agree on the need to improve the walkability experience. The existing sidewalks are not capable of providing continuous and enjoyable walk in the city.

Table 10: The accessibility of the shoreline.



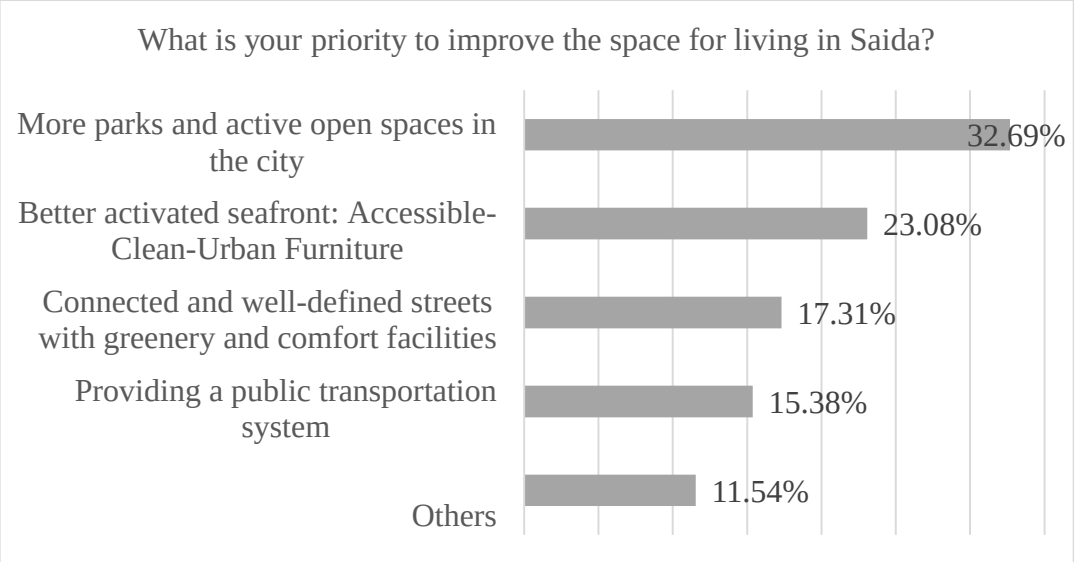
The shoreline as the main public space in the city is hardly reached on foot. The existing coastal boulevard hinders safe crossing to the sea. This is agreed by the city residents.

Table 11: Accessibility to the city green assets



The survey shows a high agreement on the need to enhance the visual accessibility to the city green assets through providing public spaces and pedestrian walkways along them.

Table 12: Participants perception about improving the space of living in Saida



The presented themes are all a necessity in the city that need to be addressed in the city green strategy. The parks present the highest percentage for the city has few parks. The public transportation network presents the least percentage for the residents depends on their private vehicles as a solution for their transportation.

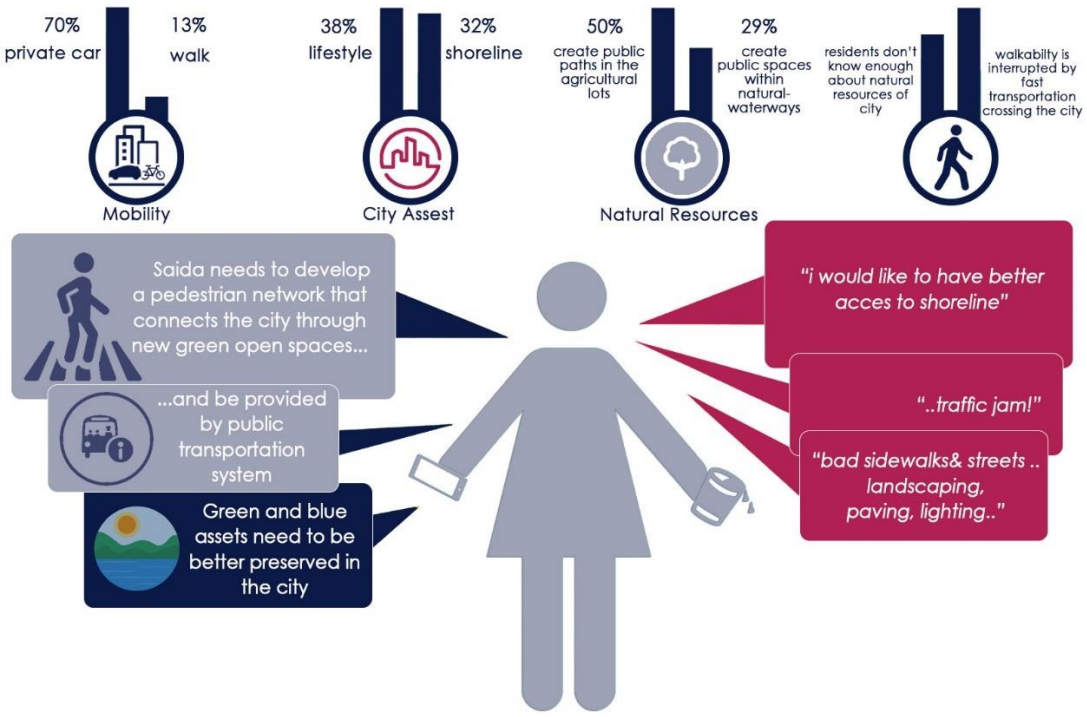


Figure 90: Questionnaire Summary Graph. Source: Author

The survey shows that the participants aspire a better connected and welcoming space in the city. They hope for improved accessibility to the city blue and green assets. This confirms the thesis assumptions and emphasize the need for a green approach in Saida.

F. Al Qamla Existing Case

Figure 91: Al Qamla existing case. Source: Author

The Existing Case is missing:

a. Any visual trace of the water stream
b. Quality of place
c. Consideration for Al Qamla neighborhood value
d. Parks of any size
e. Outdoor meeting areas
f. Densification of space
g. Accessibility to agriculture lots
h. Recreational facilities Enhancement
i. Pedestrian connections and enjoyable walkable spaces
j. Street Greenery

G. Al Qamla Design Scheme

1. *Design Objectives*

a. Preserve the city natural assets:

   Uncover the water stream where possible

   Preserve existing green spaces along

   Use green tools to identify its path where it can't be uncovered

b. Create superior public realm:

   Improve pedestrian circulation and create comfort and leisure spaces

   Activate the street life where needed

   Create accessible green spaces of multiple typologies

   Decrease the notion of physical disconnectivity created by the vehicular network

   Highlight old building character

2. Design Principles

The water stream links main two natural assets, the public beach and the existing agricultural areas, and two urbanized spaces, the inner-city fabric and the hillside urban expansions.

Figure 92: The water stream connects two main natural features in the city

Figure 93: The water stream connects two main urban spaces

There are different approaches towards the land pooling project in the agricultural lots. The land pooling project by Mr. Habib Debs proposes to uncover Al Qamla water stream and to create a public garden along it (refer to Figure 94&95). This green approach is adopted. Thus, the design aims to connect the existing main public space, the shoreline and the proposed public space, the garden to be along the agricultural spaces.

Figure 94: The Proposal of Mr. Habib Debs for part of the land pooling project. There is a major discourse about the project and it is subject to changes.

Figure 95: The suggested green public space along Al Qamla water stream

To achieve the envisioned linkage at Al Qamla water stream these points are noted regarding the blue-green infrastructure:

First, the sewage network needs to be separated from the natural water passage. The municipality needs to consider more sustainable approaches for the problem of its waste water and to value its natural water resources.

Second, the Qamla water stream signifies only a section of a larger water network that needs to be protected from its source. While the project deals with a section of the waterbody, a more holistic approach and strategic vision need to be set to preserve the whole water body. Yet with the thesis limitations this wasn't possible.

Third, the public space around Al Qamla water stream, as the rest of the water streams in the city need to be preserved rather than being transformed it into a part of the grey infrastructural network. This approach is still feasible in the agricultural spaces and presents an opportunity to benefit from the existing case. The same approach can't be easily applied to urbanized spaces.

Fourth, to capture the rain water and infiltrate it in a more natural way, a substitute to the traditional old tool is suggested. Today, the rain water in urbanized areas is polluted for it washes pollutants from the ground and runs into a combined sewage network. Thus, it limits clean rain water infiltration to replenish underground water or reach the shoreline. Rain gardens are planned as a more natural tool to capture rain water. They purify and infiltrate the received water. This method decreases the load on the sewage network, reduces flooding possibilities in winter, and feeds underground water bodies. While this method is gaining more and more success in Europe and the US, it is still not tested in Middle Eastern countries.

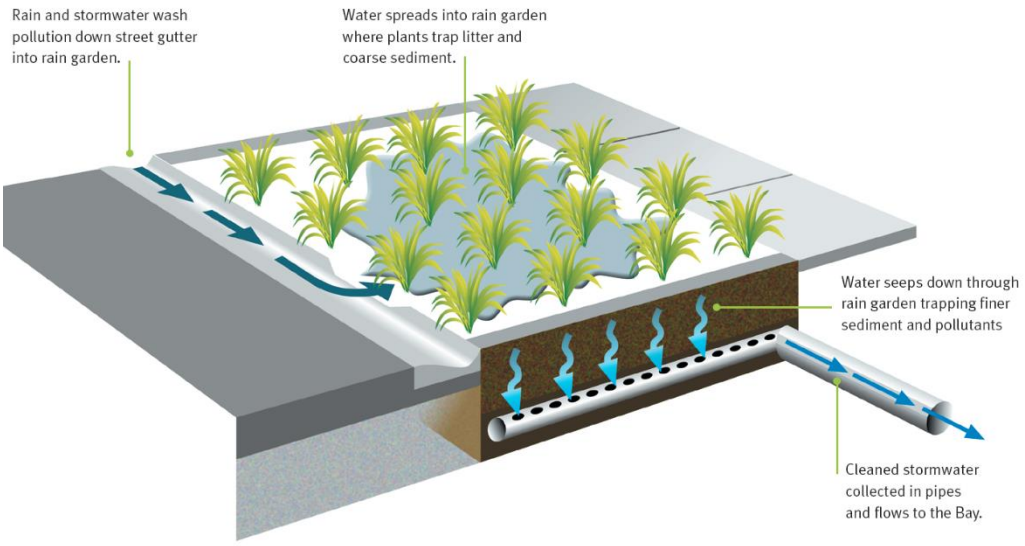


Figure 96: Typical rain garden. Source:www.kingston.vic.gov.au

Thus, the water stream is separated from the waste water network and day lighted along the agricultural spaces. It runs in a clean pipe under the developed areas. Rain gardens are planned to capture, purify and infiltrate rain water in urban spaces where the stream can't be uncovered. The rain water overflow is purified and channeled with the water stream to reach the shoreline.

Along with the blue infrastructure propositions these are the design principles utilized:

- Decrease the width of the vehicular lanes where possible and use paving treatments to enforce pedestrian precedence and path directionality. The three main arteries bisecting the city sphere are suggested to be narrowed with the same number of vehicular lanes to calm the traffic speed. This approach is based on the CDR proposal of providing a through traffic artery outside the city limits. Also, the design approach is part of a larger green strategy. This highlights the

need of a parallel transportation strategy that provide public transportation network and decrease the dependency on the private car.

- Define a “curbless” street section to facilitate different modes of transportation on the same platform where possible. Widen the pedestrian path. Define regulations to preserve a continuous wide walkway.
- Provide adequate parking spaces yet reduce the impact of parking spaces along the street.
- Highlight current assets:

  Extend the outdoor space around Al Zaatari mosque. Create a shaded area and enhance the area greenery.

  Renovate and pedestrianize Al Qamla neighborhood. Transform part of it as a traditional crafts school
- Create urban rooms, suggest land use to improve social street life.
- Integrate existing retail shops and add new shops and multifunctional spaces where needed. Emphasize the mixed use existing typology to activate the street life.
- Create an accessible public space based on Habib Debs approach. Activate the proposed public garden through multifunctional podiums.
- Emphasize the cultural aspect along the spine. The spine embraces a mosque, an old neighborhood, a cinema in the shopping center. Thus, additional cultural activities are suggested to emphasize this character along the water stream.

3. Design Proposal

Figure 99: Design Proposal. For details refer to figure 92& figure 93.

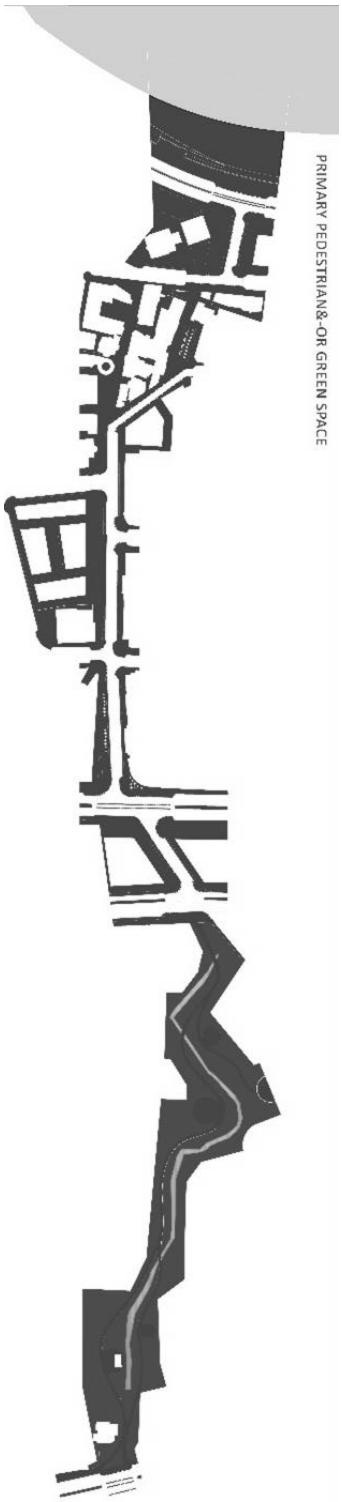


Figure 98: Primary Pedestrian-Green Spaces

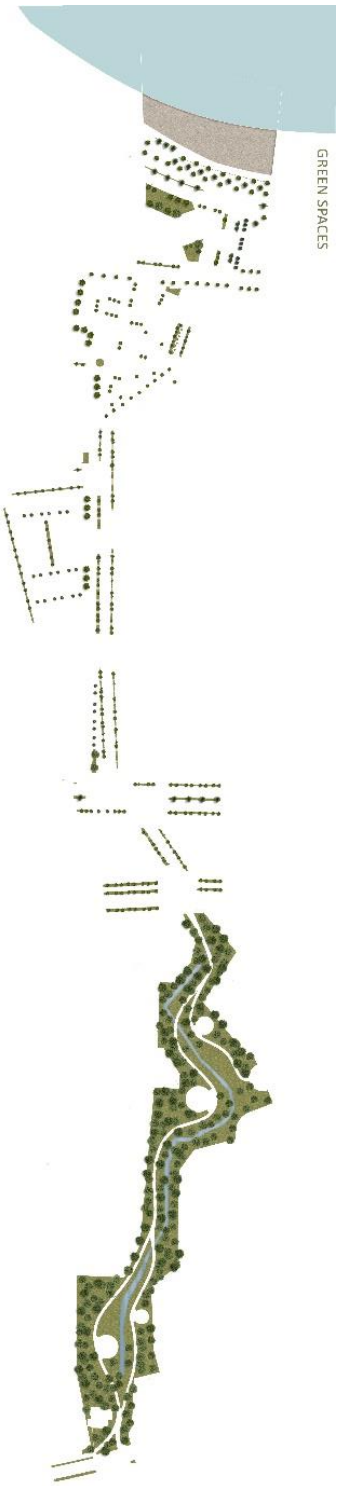


Figure 97: Proposed Green Spaces

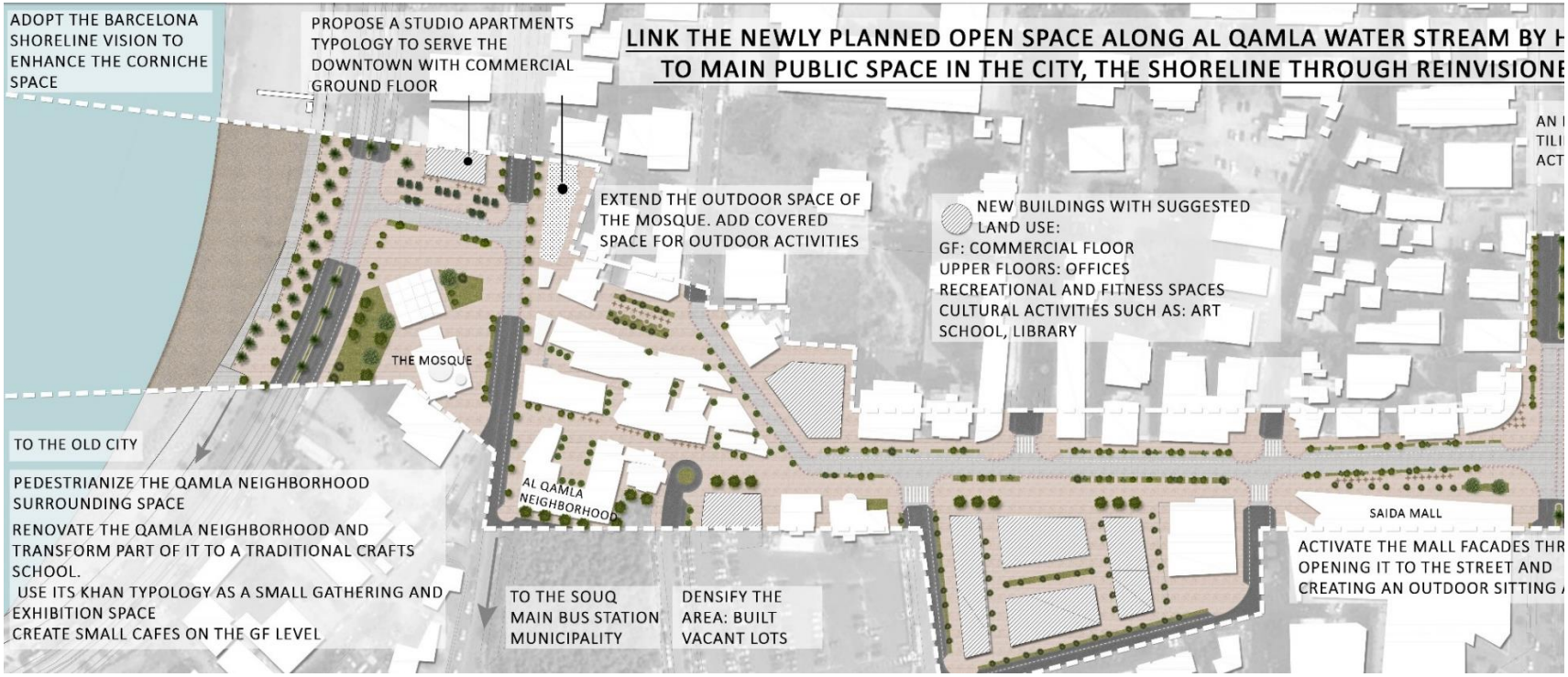


Figure 100: Design Proposal-Part1.

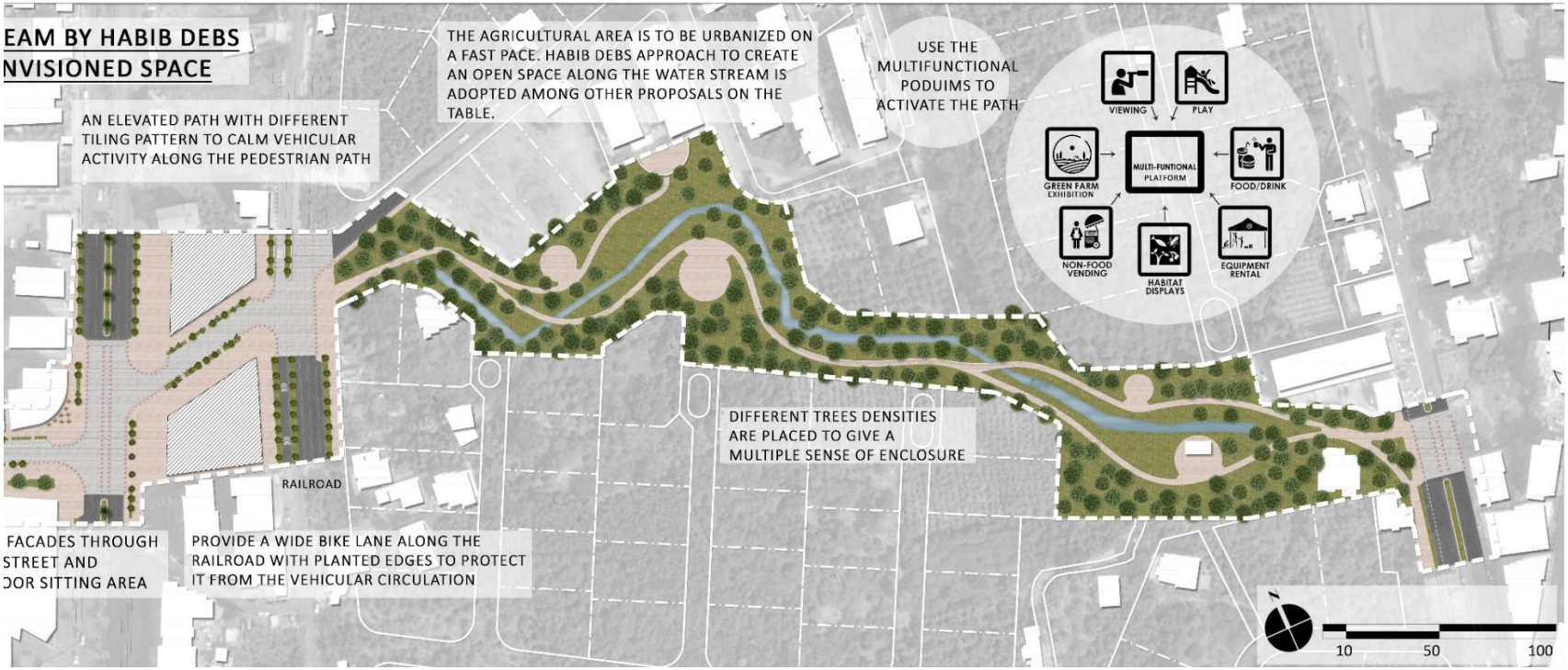


Figure 101: Design Proposal-Part 2

4. Sections

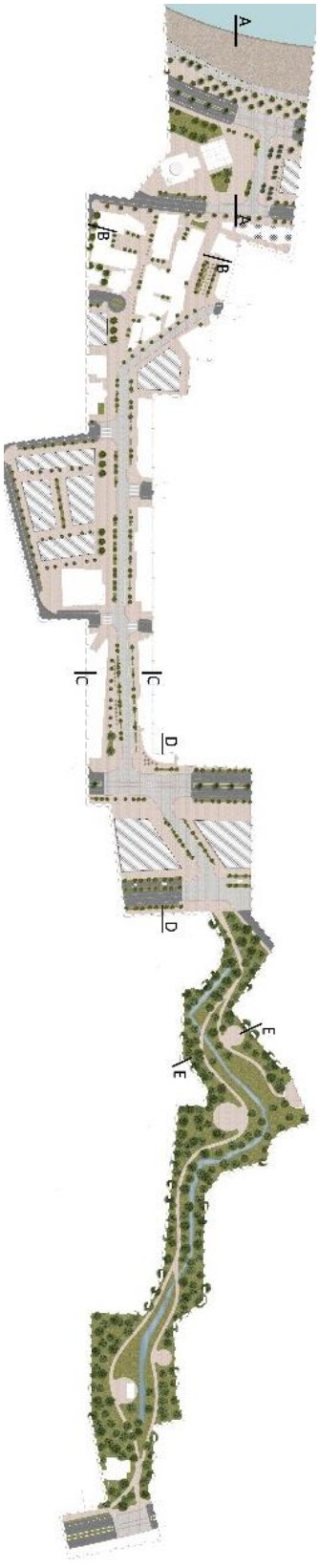


Figure 102: Sections Location

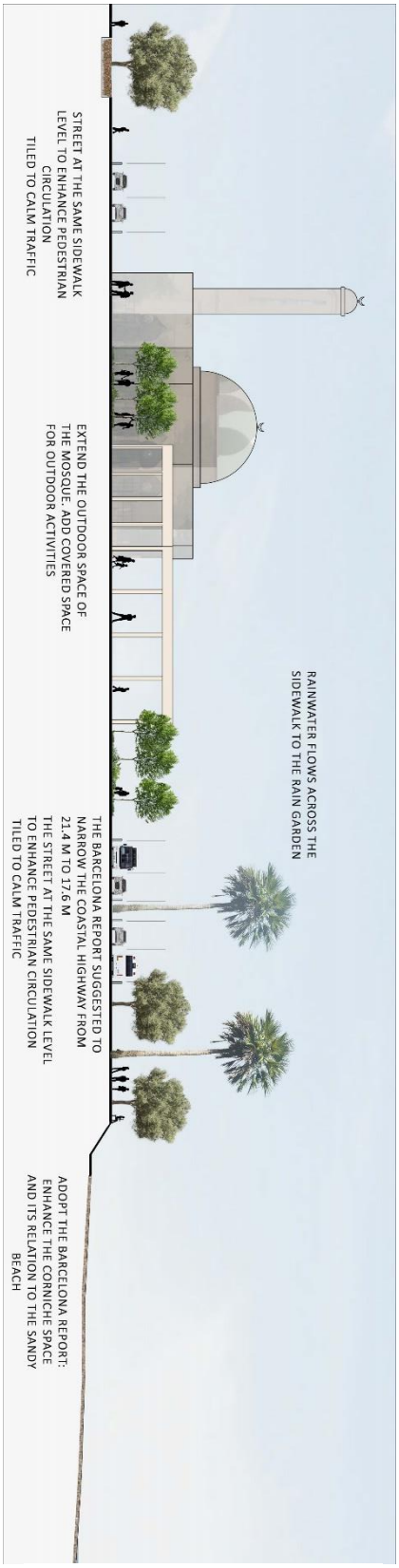


Figure 103: Section A-A

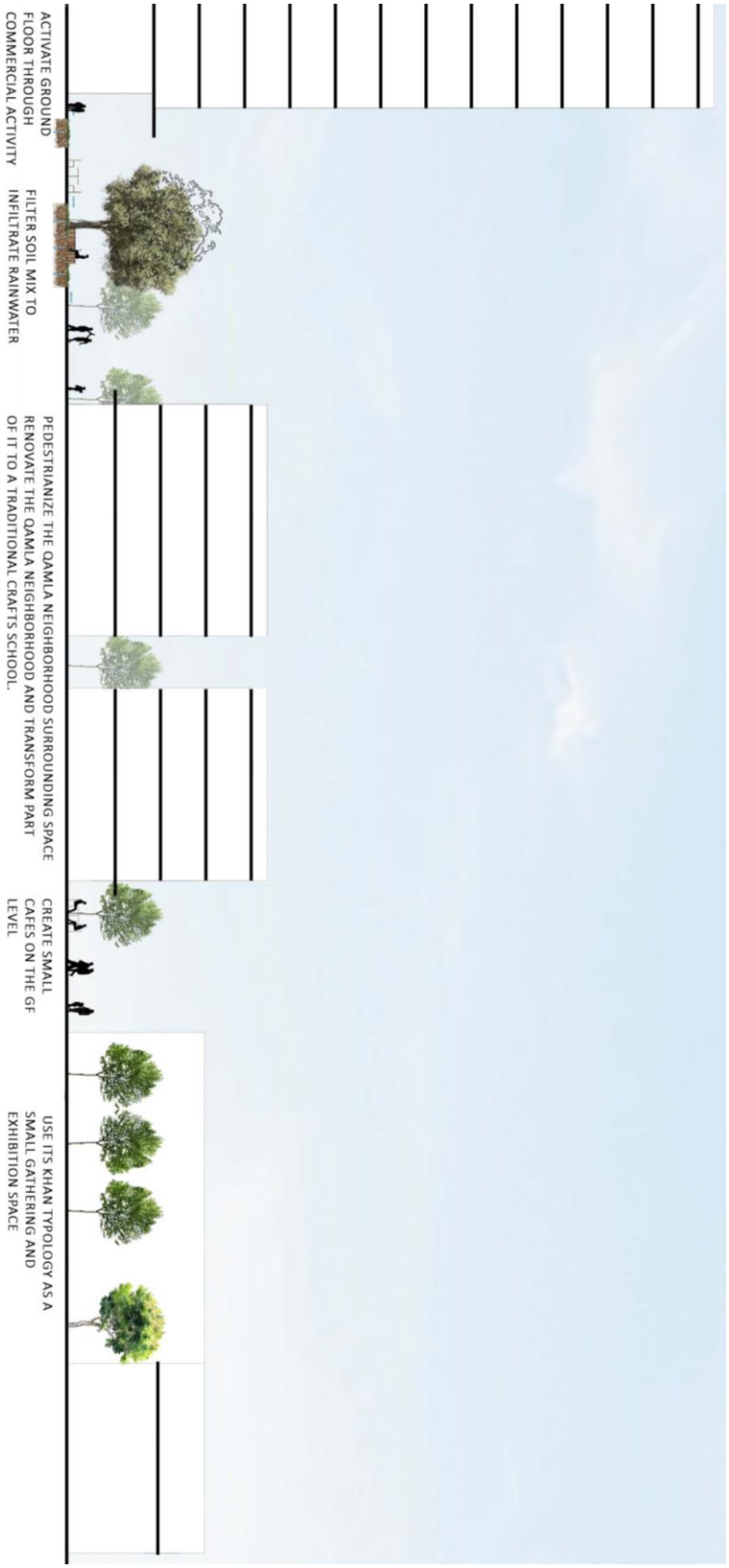


Figure 104: Section B-B

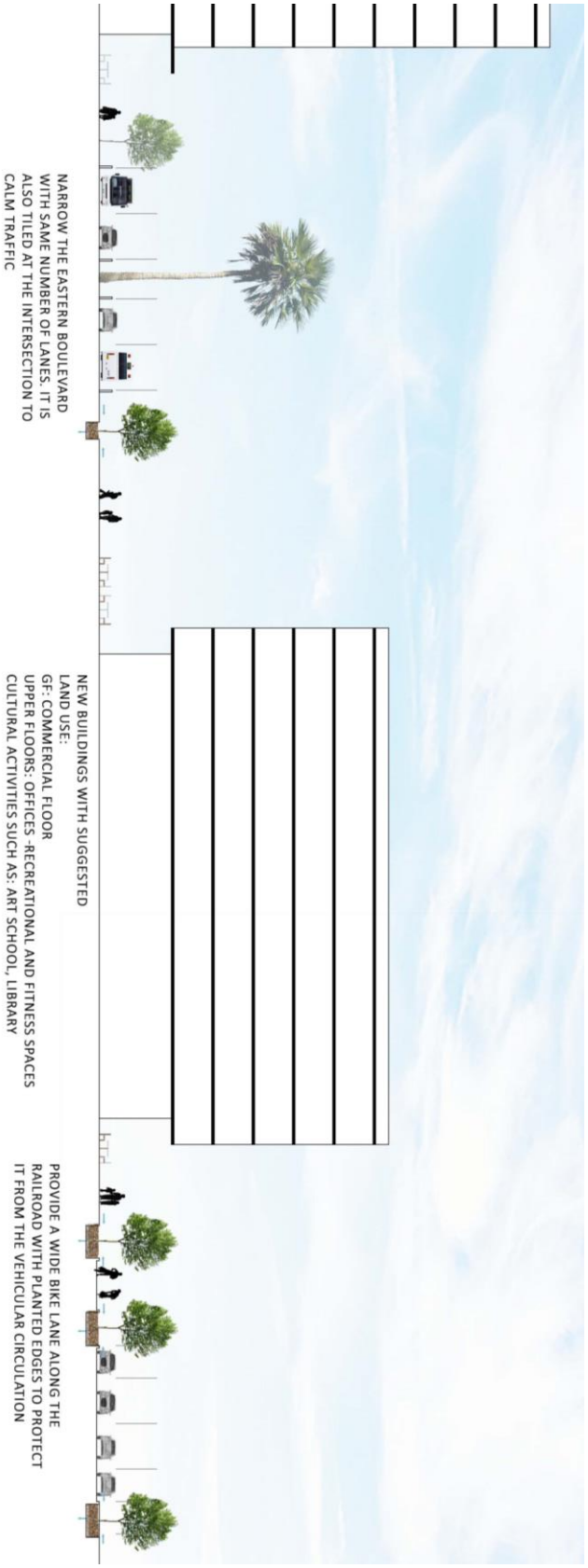


Figure 105: Section D-D

Figure 106: Section C-C

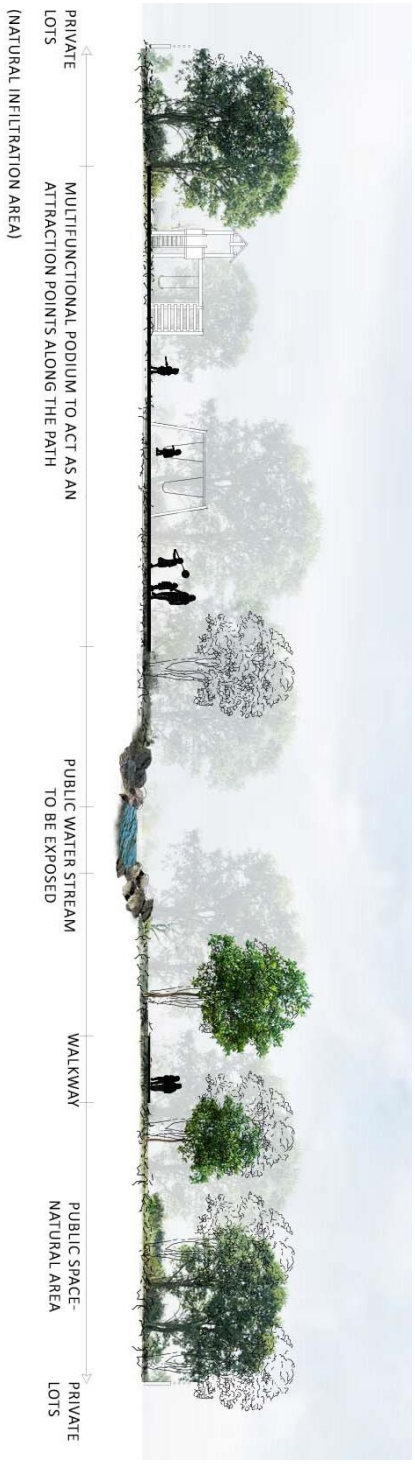


Figure 107: Section E-E

CHAPTER V

CONCLUSION

The thesis addresses degraded city connectivity, as a consequence of car dominated planning and blanket zoning guidelines. It tracked the city evolution from being a coherent agricultural space with naturally flowing water streams to the urbanized space of today. The thesis highlights how current regulations threaten the city's most valuable assets and the municipality failure to present a sustainable solution for the future. It explores the feasibility of the USUDS proposal as a strategic framework to preserve the city natural assets and employ them as a tool to enhance the city connectivity. The municipality neglected the USUDS proposal with no foreseen prospects for implementation. The thesis shows how this proposal could be further developed at the district scale to address some of the city existing problems and to display a more inclusive urban design approach. Through a multi scale analysis the thesis proposes a blue green city strategy aiming to address each part along the USUDS network based on its character and location in the city. Then, a prototype intervention area is developed to demonstrate how the project could be executed if considered in the city agenda.

The project offers better-connected spaces and enhanced street scape, it also proposes land uses and widened buildings setbacks. It better shapes the physical features of the area to improve its outdoor activities and provide upgraded shared spaces. The creation of the place utilizes elements of the built environment to accentuate the distinct beauty and identity of the area. However, this approach draws a question

about tools of implementation. While the municipality is the stakeholder responsible for the public realm in the city, further regulations and incentives could be set to interfere along the private properties. Examples could be through tax reduction, soft loans, future benefits of property value increase, etc... However, it all starts with an effective municipal body incorporating a future paradigm for the city. The weakness of the city authority and its minimal income and funding resources leaves the city to real estate developers to shape the city features in the years to come.

The project is bounded by two former proposed projects for the city, the Barcelona seafront proposal and the land pooling project. The Barcelona report aimed to expand the shoreline area and to decrease the width of the coastal boulevard, and the land pooling project aimed to propose the main public spaces in the area along the buried water streams. Both projects were requested by the municipality of Saida, yet the latter always states that the requested funding for the projects is not available. To add, the land pooling proposal was criticized for not providing the mandatory green spaces in the form of sellable lots. Consequently, the municipality would be able to benefit from selling them in the future, just as what happened in the Western land pooling project.

The land pooling project threatens the largest agricultural space in the city. The thesis sheds light on the rapidly decreasing agricultural spaces in the city today that are not protected by any law and deemed to change in the near future. In the land pooling area, the urban design proposals are restricted by fixed law mechanisms. It requires a 25% of the project area to be transformed into roads and green spaces regardless of the currant area character. The resultant project is mainly a new residential area in the city with focus on real estate direct profit. While the construction projects provide the main

revenue for the city municipality, there is no wonder why the city is seeking to transform its largest agricultural space into buildable lots as soon as possible. This stresses real estate as a main sector in the city rather than seeking for a more diversified economic base.

While the idealistic case is to preserve the agricultural lands as a green lung within the expanding urban fabric of the city, the reality is that the land pooling project is under study to be executed in the near future. The municipality is seeking for the required funding with no success so far. Although development trends will continue and agricultural land will disappear, the municipality can enforce a higher percentage of green spaces on developers to maintain the area character. Currently regulations of a 25% for roads and green spaces is low considering the large green area existing today. In addition, the development should be carried out in multiple phases to ensure that agriculture is maintained for the longest period. Also, the low density development should be avoided with a preferred higher density development to ensure cost efficiency.

While this project seems to be a municipal priority, other projects of high importance are not being addressed. A new garbage mountain is developing in the city with no clear vision for an environmentally and socially appropriate solution. Similarly, natural water streams flow as part of the sewage network with no prospects of separating the two. Sustainable tools are not being implemented in the city. While Saida obtained many studies to enhance the city sphere along the years, very little implementation was done on the ground. The short-term solutions are the easy way out.

The project is an ambitious approach and part of a future vision for the city, with the hope of considering more green solutions. While the theme of green infrastructure is

a newly applied theory in Lebanon, the thesis reveals the need to shift from the outdated urban design tools to a guided vision that addresses the city of today.

The case of Saida is not unique in its position and problems. In the light of new theories there is a need to present a new theoretical model considering the coastal cities having the same place. A detailed critical approach could be appointed to the unregulated urban expansion over the agricultural spaces and the domination of grey infrastructural projects bisecting the city sphere.

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