



BRINGING LIFE BACK TO FALASTIN STREET IN JEDDAH, SAUDI ARABIA

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Abstract

In modern urbanism, streets are essential to providing urban vitality, with pedestrians playing a key role. The process of pedestrianization of a city is important to the quality of life of all its inhabitants, but does not always receive the attention it deserves in urban plan development of cities in Saudi Arabia. Improved pedestrianization could significantly contribute to bringing vitality to the streets of the Kingdom's cities, where many of the city residents tend to use private cars rather than walking in the streets. In this empirical study, we chose Falastin Street as the case study in the city of Jeddah, Saudi Arabia. As part of the underlying theoretical framework, we reviewed the new urbanism criteria and principles. Subsequently, site analysis was performed, including land use, traffic, building height, wind, sunlight, access and nodes. The nodes were obtained by applying social media data gathered from the application Snapchat, which was used to create the heat map of the Falastin Street. Furthermore, four successful case studies were chosen, with at least one common feature in terms of weather, economy, social life, and length, in our case. The case studies were divided into two types: new and renovated projects. The streets were evaluated according to various urban and architectural aspects. Comparison of studies yielded several flaws, including lack of appropriate lighting and human scale consideration, as well as insufficient public spaces and attractive elements. A review of cases of effective pedestrianization of streets enabled us to outline the principles of urban renovation projects, including diversity in commercial activities, increased density in the center of the street and architectural quality improvements, such as addition of open spaces around the center of the street for visitors. For the master plan, the site was divided into 5 zones, with each zone having its own public space. Approaching the urban design criteria by studied and obtained principles enabled establishment of the main objectives of the project, including spaces for outdoor daily life activities and social gathering in this street. As a main solution for increasing the density in the site, we proposed increasing the center social life activities of the street, as the main node can increase the value of the middle site due to augmented density. In addition, using the retail marketing approach, we have determined that distribution of brands on the Falastin Street can serve as attractive points for pedestrian movement. These distributions were provided by Grasshopper software, yielding five scenarios, with the optimal chosen scenario offering the best connection network among the brand stores. Finally, the master plan was generated by creating the public spaces inside the site and considering the optimal distribution of brand stores on the street. Considering the rich cultural heritage of Jeddah, another recommendation includes the use of its specific traditional windows called Rawashen for urban façades. Other strategies for enhanced pedestrianization of the Falastin Street include promotion of public spaces and brand distribution as attractive elements for visitors to visit by foot. Applying such criteria in the similar streets could help city planners and policy makers in pedestrianizing the streets in Saudi Arabia.

Key words: Urban Design; New Urbanism; Reinvention

1. Introduction

Here, in modern urban design, streets are spaces designed accommodate various types of movement, providing accessibility to buildings and open spaces, surface parking, drainage and utilities, as well as social gatherings and other various activities. A street network is a system of

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interconnecting paths and nodes that affect the inhabitants' mode of transportation, economic engagement, as well as lifestyle (Girling & Kellett, 2005). The concept of walkable city has been the case of several studies in recent decades, while its importance is stressed specially for providing safety and security (Southworth, 2005; Speck, 2013). In Jeddah, excepting Historical Jeddah, the street network is viewed as a transportation network for private cars, rather than as public spaces for pedestrians. The lack of other any other network for transportation, i.e. walking and cycling paths and bus lanes, together with the existing configuration of the network, deprives the city streets from necessary vitality. This can be evidenced by the absence of outdoor activities and social gathering spaces. Through an urban design project, the present study is aimed to revitalize a previously selected urban street through enhanced pedestrianization. However, this aim can be achieved by considering the streets as places rather than as movement paths. The methodology of the present research includes providing theoretical framework and a comparison with similar sites, as well as analyzing the study area and providing design criteria for renovation and reform.

1.1 *Principles of New Urbanism*

The principles of new urbanism can be applied increasingly to projects ranging from a single building to an entire community. These principles include the following (Rahnama et al., 2012):

1. Walkability. This is a measure of how friendly an area is for walking. Walkability provides health, environmental, and economic benefits. Factors influencing walkability include the presence or absence and quality of footpaths, sidewalks, traffic and road conditions, land use patterns, building accessibility, and safety, among others (Welle et.al., 2015).
2. Connectivity. This concept refers to the directness of links and density of connections, such as intersections, in street networks. Connectivity enables traffic distribution to facilitate creation of walking spaces, and encompasses a hierarchy of narrow streets, boulevards and lanes. Moreover, connectivity enables mixing of city dwellers of different ages, classes, cultures and races, therefore, promoting diversity (Mecredy et al., 2011).
3. Mixed Housing. This concept involves creating a range of types, sizes and prices of houses located in close proximity to each other (Boeschstein, 1971).
4. Quality Architecture and Urban Design. This concept emphasizes beauty, aesthetics, human comfort, and creating a sense of place, as well as special placement of civic uses and sites within community. Moreover, according to its principles, human scale architecture and beautiful surroundings nourish the human spirit (Ellis, 2002).
5. Increased Density. According to this concept, increased density of buildings, residences, shops, and services can facilitate walking, enabling a more efficient use of services and resources, and creating a more convenient and enjoyable space (Rahnama et al., 2012).
6. Traditional Neighborhood Structure. This concept encompasses use of distinctive and distinguishable edges, with public spaces in the center, with highlighted importance of designed public realm and open space quality as civic art. Such areas enable a variety of uses, with public facilities located within a walking distance (Bothwell, 1989).
7. Smart Transportation. This notion is focused on five types of transportation: walking, rollerblading, use of scooters, bicycles and trains (Handy, 2005).
8. Sustainability. This concept refers to environmentally-friendly technologies that place high value on natural ecological systems values. It involves using energy efficient



technologies, decreased use of fossil fuels and preference of walking over using vehicles for transport (Grant, 2009).

9. Quality of Life. This is a complex, ambiguous and multi-dimensional concept, represented by a reticular relationship between various dimensions; such relationships differ and are determined according to specific places and societies (Serag El Din et al., 2018).

2. Methodology

The methodology of this study consists of the following steps:

1. Defining the theoretical framework by examination of the principles which help to provide specific criteria for comparison of the site used in the study with similar case studies.
2. Site analysis and field observation, which included architectural and urban analysis. The field observation involves two steps. First, typical observation was carried out using a 24-hour time lapse. For this, we chose the most traffic-heavy day of the week according to the data obtained from Google Maps. In addition, in order to apply social media analytics tools, we used Snapchat data to capture the site map for a period of 20 days in the study area. Then, we used a layering method to determine most dense site area of the site to identify the focal points and which can be used for density distribution across the site.
3. Selecting similar case studies based on a set of criteria including length, weather, area, and whether the project is new or renovated. As such, four case studies were chosen, based on similarity in one or more criteria. These cases included Dubai's City Walk, Barcelona's La Rambla, Copenhagen's Superkilen, and Miami's Design District.
4. Evaluation was carried out by site comparison with similar case studies. Accordingly, ten urbanism principles were used in the evaluation, so that we divided the cases into three levels of new urbanism principles achievement strength: weak (0-39 %), average (from 40-80%) and strong (81-100%).
5. Analysis with application. The fourth step of the determined site weaknesses in terms of the ten previously established principles. Three different principles were chosen in order to increase quality of life of Falastin Street, with the following three new urbanism principles: Increased Density, Mixed Use and Diversity, and Quality Architecture and Urban Design. Various methods were used to assist in determining how vitality could be increased on Falastin Street, including social media surveys, field observation, and comparisons.
6. Guidelines were formulated from the results of analysis, and were used in the design of the urban street by providing site-specific criteria.
7. Assessment was carried out as the final step, by application of developed guidelines for Falastin Street and using Grasshopper, a new analytic tool, which enables creation of multiple products by changing a single component. After various scenarios were generated, the appropriate alternative was selected and applied in order to produce the master plan.

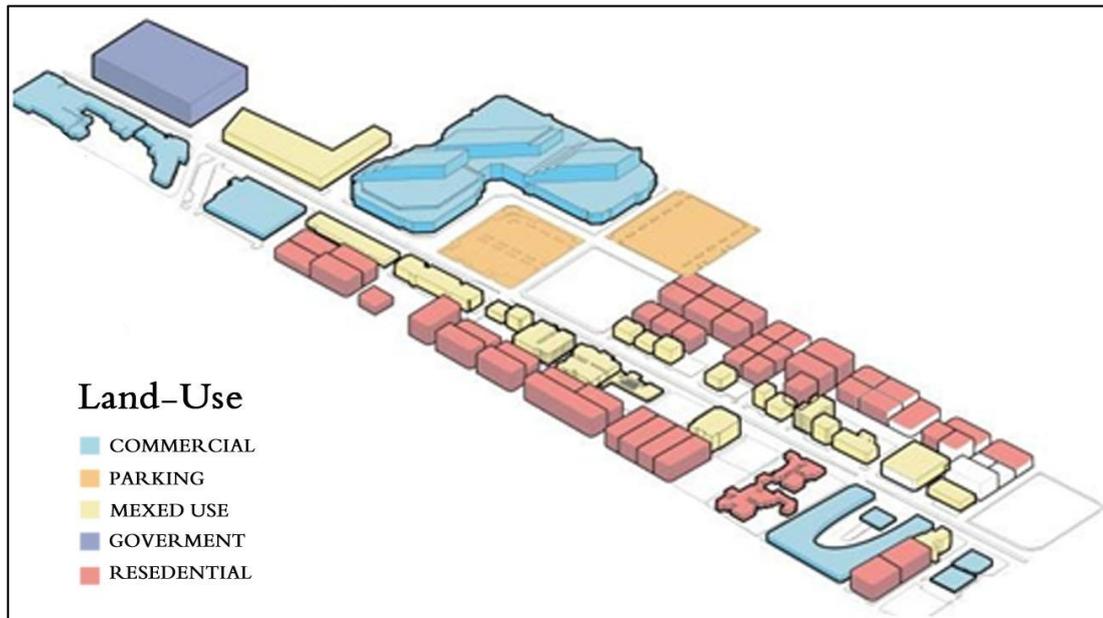
3. Results

The results of the project include site analysis, review of case studies and applying the principles of new urbanism.

3.1 Site Analysis

The site was analyzed in separate plans, including the plan of street types, building height, solid-void, traffic time, as well as the amount of wind and summer shade. In addition, land use was analyzed as shown in (Figure 1).

Figure 1. Land Use of the Falastin Street



Source: Edited by Research Team

3.2 Study of Successful Cases

Four pedestrianized streets were selected for review in this section. Each project was chosen due to sharing specific characteristics with the case study of Falastin Street.

3.2.1 Miami Design District

The Design District is composed of primarily old low-rise warehouses that have been converted into retail spaces, art galleries, restaurants and cafés, but now includes a large amount of new construction, primarily used for high-end retail. It is home to over 130 art galleries, showrooms, creative services, architecture firms, luxury fashion stores, antiques dealers, eateries and bars.

- Architects: DACRA
- Location: Miami, USA
- Area: 64,000 sqm
- Project Year: 2015
- Transportation types: cars, bikes, metro, walking
- Traffic: Moderate at noontime and high traffic in the morning
- Street types: Arterial roads, distributors, local roads
- Public space: Consists of plazas
- Type of Buildings: Mixed-use (2-5); retail (2-3); offices (2-4)



- Solid and Void: 39% solid and 61% void
- Parking: Around plazas and underground

From review of the Miami Design District, it was gathered that the façades in the cross nodes are complex and serve as view point points for individuals crossing the site either by public transportation, walking or even cycling, as these details help to gather or welcome people towards the site. Accordingly, we recommend that this design characteristic should be applied to Falastin Street.

3.2.2 *Superkilen, Copenhagen*

Superkilen is a park that spans one km in length and is situated in the Nørrebro area just north of Copenhagen's city Centre. Superkilen is home to more than 60 nationalities, and is considered to be one of the most ethnically diverse and socially challenged neighborhoods in the Danish capital.

- Architects: BIG
- Location: Norrebro, Copenhagen
- Area: 30,000 sqm
- Project Year: 2012
- Transportation types: Cars, bicycles, metro, walking, bus
- Traffic: Moderate at noontime and high traffic in the mornings
- Street types: Main roads, arterial roads, distributors
- Public space: Playgrounds and parks
- Type of Buildings: Mixed use (2-3); sports centers (1-2); residential (4)
- Solid and Void: 35% solid and 65% void.
- Parking: Buildings, underground and around buildings.

3.2.3 *Dubai City Walk*

Encompassing detailed architecture, common visual language and culturally relevant design, Dubai City Walk is a contemporary, open-air destination that responds to the surrounding streets and buildings. Taking advantage of existing public spaces and views, it has captured the civic heart of central Dubai, leaving a positive legacy for the region.

- Architects: BENOY
- Location Dubai, UAE
- Area: 81,000 sqm
- Project Year: Ongoing
- Transportation types: Cars, bikes, metro, walking, bus
- Traffic: High traffic most of the time
- Street types: Main roads, arterial roads, distributors
- Public space: Plazas and Market.
- Type of Buildings: Mixed use (3-4) Hotel (7) Residential (6)
- Solid and void: 30% Solid and 70% void
- Parking: Buildings, underground and around buildings.

3.2.4 La Rambla, Barcelona

This street is located in Barcelona, next to the city's marina. La Rambla is a long street with local shops and a pedestrian path. The street is also of great value to the city and its inhabitants due to being one of the oldest streets in Barcelona.

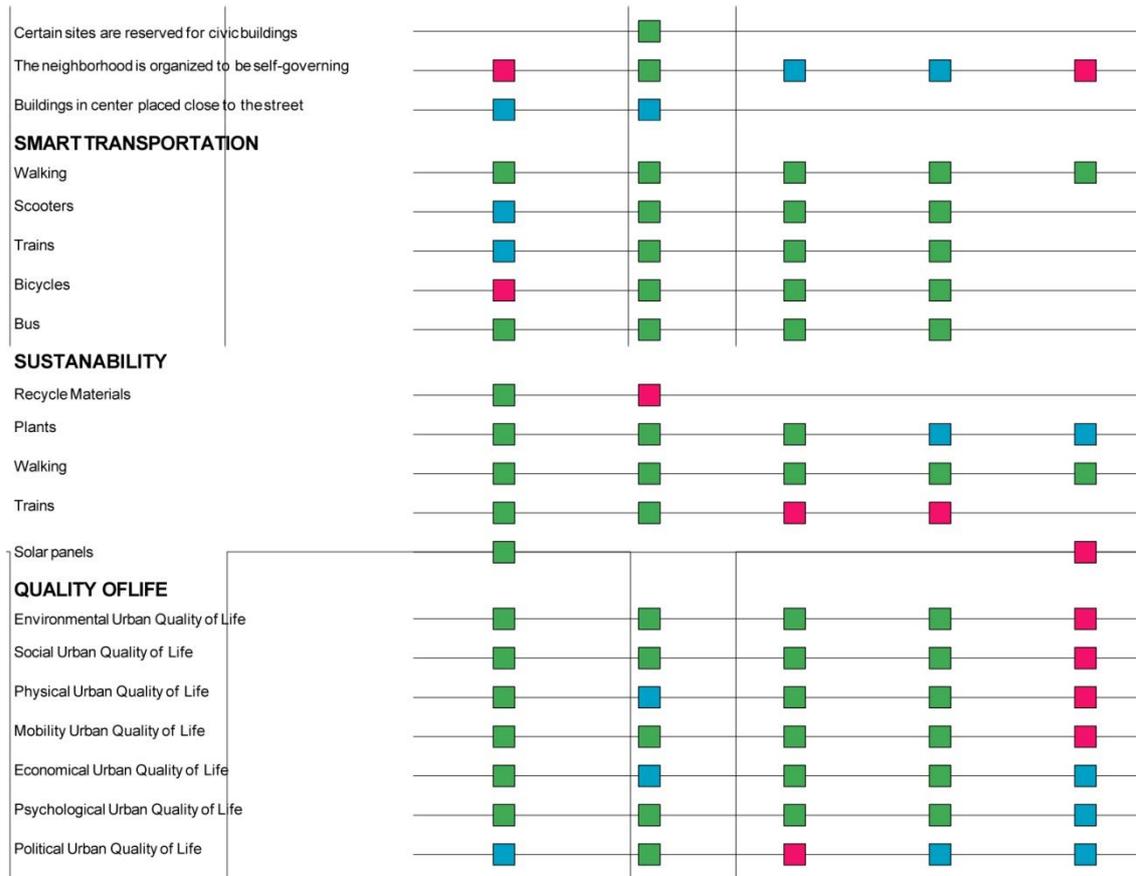
- Location: Barcelona, Spain
- Area: 31,000 sqm
- Transportation types: Cars, bicycles, metro, walking, bus
- Traffic: High traffic most of the time
- Street types: Local roads
- Public space: Pedestrian path
- Type of Buildings: Mixed use (3-5)
- Solid and Void: 43% Solid and 57% void
- Parking: Buildings, underground and around buildings.

These four streets are evaluated in Table 1 presented below.

Table 1. Evaluation of four studied Cases in Regards to Falastin Street

	WEAK	AVG.	STRONG	DUBAICITY WALK	SUPERKILEN	LARAMBLA	MIAMI DESIGN DISTRICT	FALASTIN
WALKABILITY								
Building Sinage &Lighting - Light the pedestrian walk				STRONG	STRONG	STRONG	STRONG	AVG.
Building Sinage &Lighting -Lighting levels				AVG.	STRONG	STRONG	STRONG	STRONG
Building Sinage &Lighting - Human scale				STRONG	STRONG	STRONG	STRONG	WEAK
Building Facade - Architecture elements				STRONG	AVG.	STRONG	STRONG	STRONG
Building Facade - Display windows				STRONG		STRONG	STRONG	WEAK
Building Facade - Shading				STRONG	AVG.	STRONG	STRONG	WEAK
Building Facade - Harmony				AVG.	STRONG	STRONG	AVG.	WEAK
Building Facade - Windows & balconies 'Eyes On Street'	WEAK			STRONG	STRONG	STRONG	AVG.	WEAK
Building Facade - Massing				STRONG	WEAK	STRONG	STRONG	AVG.
Building Facade - Different texture, material & colors				STRONG	WEAK	STRONG	STRONG	STRONG
Building Facade - Visual interest to the environment				STRONG	STRONG	STRONG	STRONG	WEAK
On Site Landscape - Visual interest				STRONG	STRONG	STRONG	STRONG	AVG.
Off Street Parking - Facade for parking building							STRONG	
Off Street Parking - Behind or under building parking				STRONG	WEAK		STRONG	
Building Orientation - Provide direct access Building				AVG.	STRONG	STRONG	STRONG	STRONG
Oriantation - Visible entrance from street Building				STRONG	STRONG	STRONG	STRONG	AVG.
Oriantation - Entrance for pedestrian				STRONG	STRONG	STRONG	STRONG	STRONG

OnSt. Parking & Drive Ways - Adj. to pedestrian crossing		■		■	■	■	■
OnSt. Parking & Drive Ways - Eliminate street parking		■	■	■	■	■	■
OnSt. Parking & Drive Ways - Parallel or angled	■	■	■	■	■	■	■
Crosswalk - Improve visibility	■	■	■	■	■	■	■
Crosswalk - Signs & lights	■	■	■	■	■	■	■
Crosswalk - Create link between two sidewalks	■	■	■	■	■	■	■
Crosswalk - Safety	■	■	■	■	■	■	■
Sidewalk - Not wider than nassesry	■	■	■	■	■	■	■
Sidewalk - Encourage pedestrian travel	■	■	■	■	■	■	■
Sidewalk - Pedestrian safe & comfort	■	■	■	■	■	■	■
CONNECTIVITY							
Interconnected Streets	■	■	■	■	■	■	■
Narrow Streets	■	■	■	■	■	■	■
Pedestrian Network	■	■	■	■	■	■	■
MIXED USE & DIVERSITY							
Residential	■	■	■	■	■	■	■
Offices	■	■	■	■	■	■	■
Retail	■	■	■	■	■	■	■
Different Ages	■	■	■	■	■	■	■
Active Places	■	■	■	■	■	■	■
Reduce Car Usage	■	■	■	■	■	■	■
MIXED HOUSING							
Higher Residential Density	■	■	■	■	■	■	■
Public Trans. Connected With High Res. Area	■	■	■	■	■	■	■
Public Space Next To High Res. Areas	■	■	■	■	■	■	■
QUALITY ARCH. & URBAN DESIGN							
Aesthetics	■	■	■	■	■	■	■
Human Comfort	■	■	■	■	■	■	■
Human Scale	■	■	■	■	■	■	■
INCREASED DENSITY							
Resedntail with high density next to retail	■	■	■	■	■	■	■
services that accommodates all varity of people	■	■	■	■	■	■	■
TRADITIONAL NEIGHBORHOOD							
Discernible center	■	■	■	■	■	■	■
Dwellings within a 5minute walk of center	■	■	■	■	■	■	■
Variety of dwelling types	■	■	■	■	■	■	■
Variety of shops and offices at the edge	■	■	■	■	■	■	■
Elem. school is close for children to walk home	■	■	■	■	■	■	■
Parking is relegated to the rear of buildings	■	■	■	■	■	■	■
Small ancillary building within the backyard	■	■	■	■	■	■	■
Small playgrounds accessible to every dwelling	■	■	■	■	■	■	■
Streets are relatively narrow and shaded	■	■	■	■	■	■	■
Streets form a connected network	■	■	■	■	■	■	■



Source: Edited by Research Team

3.3 Applying New Urbanism Principles to Falastin Street

3.3.1 Increased Density

Problem Statement: The main issue of Falastin Street is its increased density, with low densities in the center, lack of public spaces, no focal points to encourage the user to explore and experience the place, and with only one focal point of interest – the King Fahad fountain at the end of the street. Pedestrians walking on Falastin Street usually visit retail shops, therefore making it necessary to establish a main density point (the center) and to add open spaces around the center for buildings and visitors.

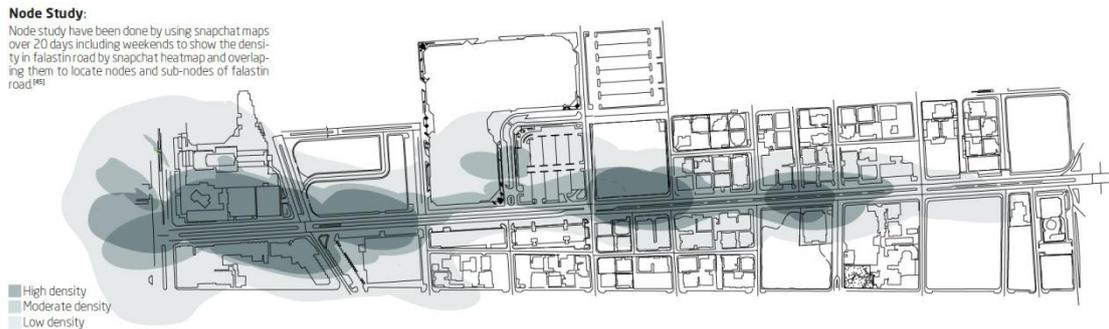
Node study was carried out using Snapchat maps over a period of 20 days, including weekends, to demonstrate the users' density of Falastin Street by using heatmaps created by Snapchat and overlapping them to locate nodes and sub-nodes. Nodes were identified at three spots: two near the edges as sub-nodes and one in the center of Falastin Street as a main node with high open spaces percentage and high-rise buildings with lesser heights towards the center (Figures 2 and 3).

A social media survey on open spaces in Jeddah was carried out using three different social media applications, Twitter, Facebook and Instagram, by using Brand24, a social media analytics tool. The results showed that the keywords "Garden," "Park" and "Open Spaces" were

associated with 760 mentions on Twitter, 2080 mentions on Instagram and 1523 mentions on Facebook. These findings underscore the importance of implementing such urban requirements.

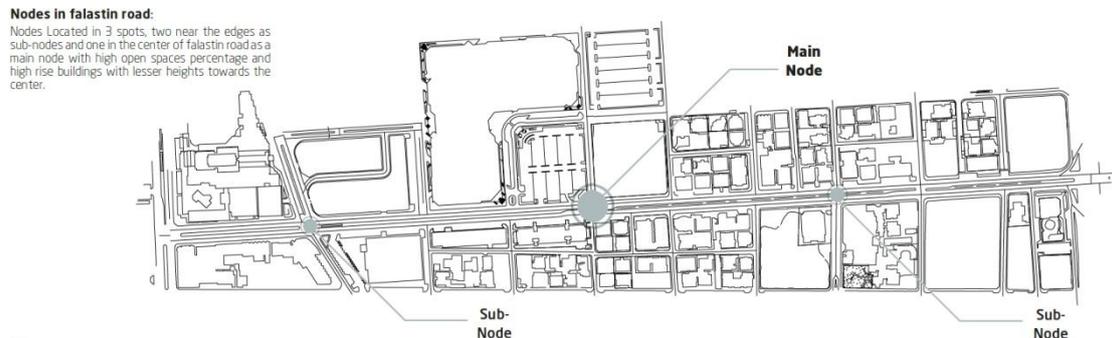
According to principles of new urbanism, the optimal ratio of building heights to street widths is 1:1 (Urban Design, 2018). The width of Falastin Street is 39m, while the maximum height to street width is 39m. Dividing street width by 3.6, which is the maximum floor height, yields 11 as the maximum number of floors.

Figure 2. Snapchat heat map



Source: Edited by Research Team

Figure 3. Main nodes and sub nodes of Falastin Street

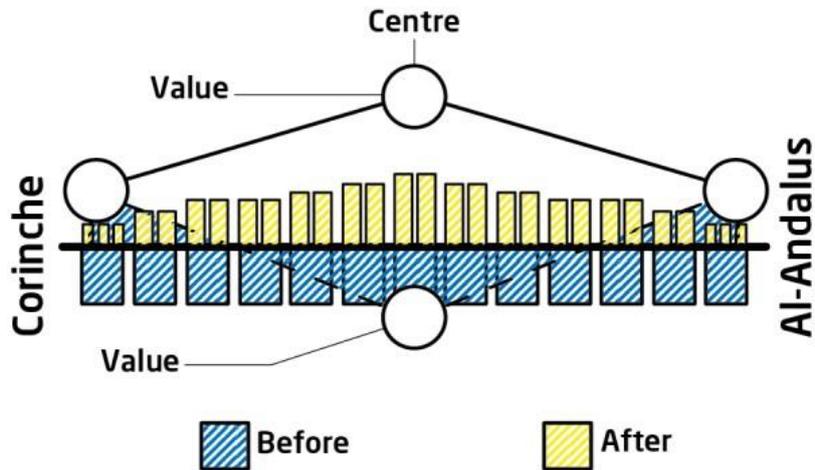


Source: Edited by Research Team

Falastin Street Heights: Building height was distributed unevenly on the street due to the lack of guidelines and uneven skylines for Falastin Street, which causes a distortion of the skyline on the site. According to the regulations outlined by the Jeddah municipality, the height limit is 100m for the entire site, which is too high for a secondary street with 34m street width.

Problem solving: After considering the new height for the value and the views, the equilibrium of the site with human scale and the elevated building was of concern. That is the reason why we tried to change the municipality regulations (FAR) in each section with exact regulations. The current value of the site is based on the two ends of the street. When verifying the value in the center of the site, it becomes reduces due to the density of the streets, which is currently on the street ends. One of the potential solutions to this is increasing the street height (Figure 4).

Figure 4. The actual and proposed value nucleus of the site after increasing the height



Source: Edited by Research Team

3.3.2 Mixed Use and Diversity

Problem Statement: There is no diversity of uses for Falastin Street, with restaurants prevailing the area (Figure 5), reducing pedestrians' interest in walking along the street and discovering other aspects of this space.

Figure 5. Establishment types on Falastin Street



Source: Edited by Research Team

Regarding the land use and diversity, there are 21 retail stores on the site, with only 4 stores containing goods to be purchased on daily errands, as well as 32 restaurants. Moreover, 30 vacant stores on the site demonstrate that the site value has decreased over the years.

Solution for Mixed Use and Diversity: As potential solutions to the issues described previously, open spaces can be distributed on either the roof of the building, roof of the podium or on the block, depending on the zone. Building heights should be subjected to a 1:1 ratio (38m) to maintain the optimal new urbanism ratio and provide shade. It is predicted that an increase in a commercial district's turnover rate and pedestrian flow will have a corresponding effect on the

local rental prices. Therefore, improvements in pedestrianization could create attract global brands to the surrounding shops, attracting even more visitors. If the district maintains its growth, local centers can develop into a denser space, triggering implementation of effective business strategies to maintain growth (Sullivan & Adcock, 2002).

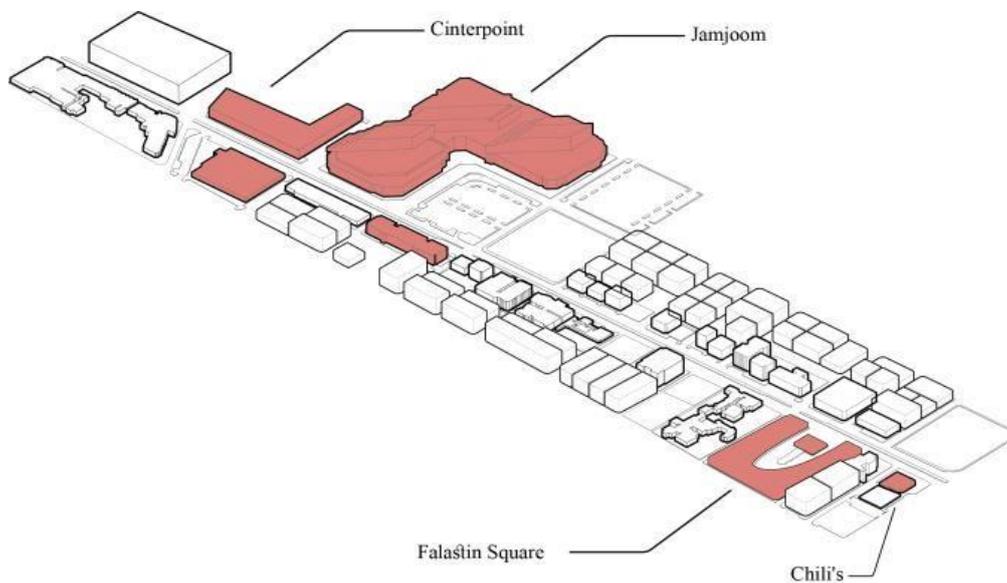
Analysis: In a similar study by analyzing Mariahilfer Strasse in Vienna, it is found out that the theory of global brand chains are scattered randomly and also somewhat far apart from each other, meaning that if one or two global brands are next to each other after these stores there are a set of local brands, and then the scenario is repeated again so people would walk to the store after seeing their sign and this helps local brands, that's why we wanted to show some of the local and global stores in Saudi Arabia and global brands just to visualize the scenario with store names.

Street realm always will be advertised either with display windows or billboards and bags, when handing over bags as advertising philosophy suggests the anonymous advertising object, and bags shows that the place or brand is in this location.

3.3.3 Quality Architecture and Urban Design

Traffic Generators are based at the two ends of the site, and serve to decrease the diversity of the generators, thus reducing the value of the center of Falastin Street (Figure 6).

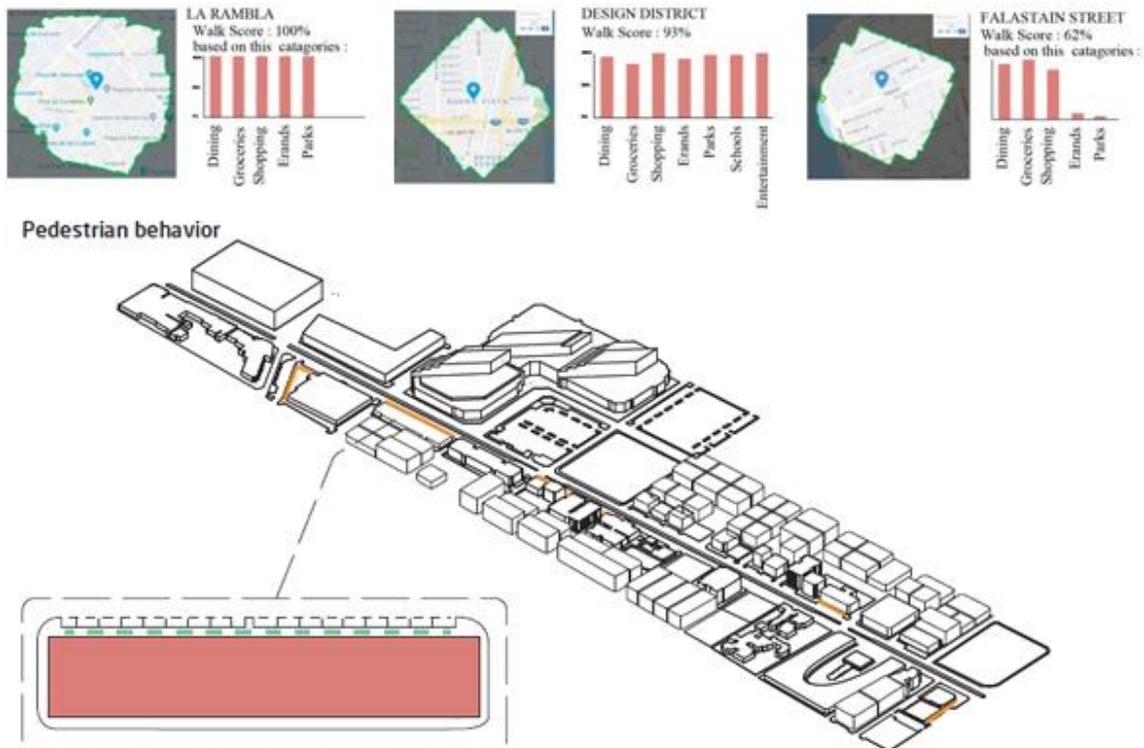
Figure 6. Traffic generators in Falastin Street



Source: Edited by Research Team

Pedestrian Movement: Falastin Street has a lower score compared with the other streets in evaluation of the previous section due to less diversity of its uses. Although the street has a higher restaurant diversity, more store and establishment diversity is needed to attract more pedestrians. Pedestrian movement on the site is limited to individuals stopping in front of the restaurants or the retail shops while walking to their destination, decreasing connectivity of the lots. The walk score of Falastin Street is displayed and compared with two other cases examined in (Figure 7).

Figure 7. Pedestrian behavior on Falastin Street and its walking score



Source: Edited by Research Team

The other suggested changes arise from case study review and site analysis. The site is divided into five main zones, with each zone containing a percentage of open spaces ratio to lot, with the center having 30% of open spaces, 20% at the edge of Falastin road and 10 at the Corniche edge.

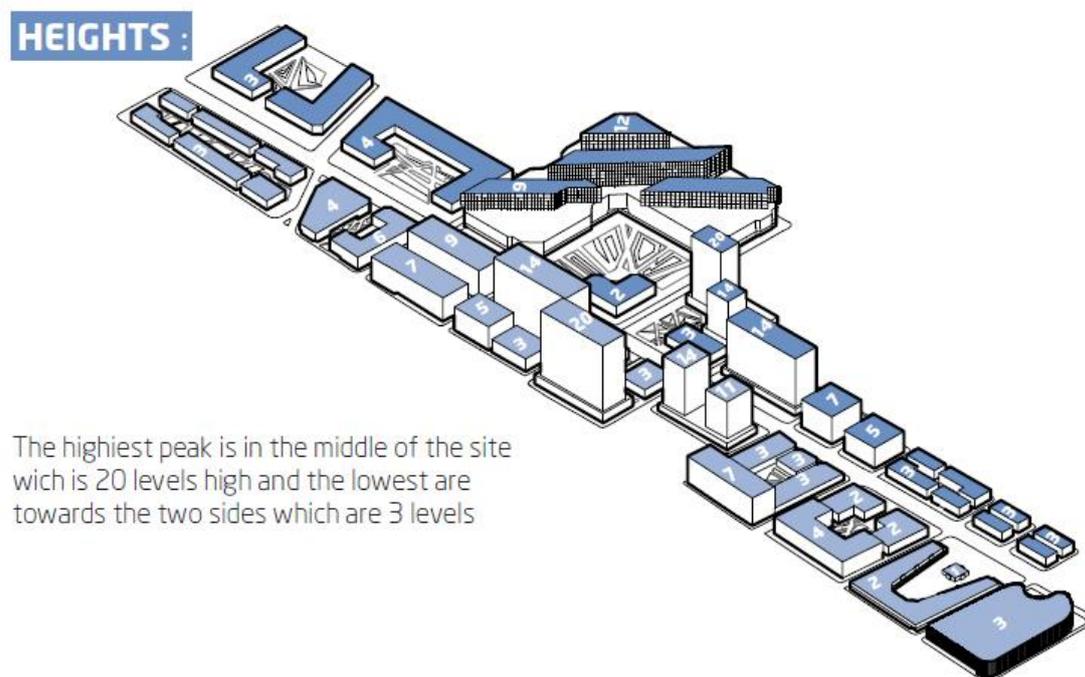
In addition, the following urban design guidelines can be applied to the master plan of the street.

- Buildings in the activity centers: Larger and more complex buildings located in places with higher concentrations of urban activity.
- Higher density residential buildings: Apartments or flats in a single building of five or more stories in height.
- Large format retail premises: Large floor area buildings used for retail purposes.
- Car parking structures: Buildings either used only for car parking or mixed with other uses.
- Principles for placement objects in the public realm include: Placement and arrangement of street furniture; utilities and small structures within the public realm; using street and park furniture such as seats; drinking fountains, bins, automatic teller machines, and public art and sculpture, payphone cabinets; trees and plants; barriers and fences such as walls; fences and bollards; lighting for the public realm; signs and way-finding information, including instructions. In malls, this includes public buildings and structures, such as shelters, toilets and kiosks.

4. Discussion

The main elements in the assessment of Falastin street were evaluated and applied to the plan. In order to develop the master plan, the proposed recommendations include creating a main node in the center of the street with modifications in height regulations of the street. This node would act as an important attractive point in the middle of the street, which has the largest open public space in the site, and would also help to attract pedestrians from both sides: Andalus and Corniche road. The highest peak is in the middle of the site, comprising 20 levels, with the lowest peaks located towards the two sides, consisting of 3 levels (Figure 8).

Figure 8. **Proposed heights of Falastin Street**

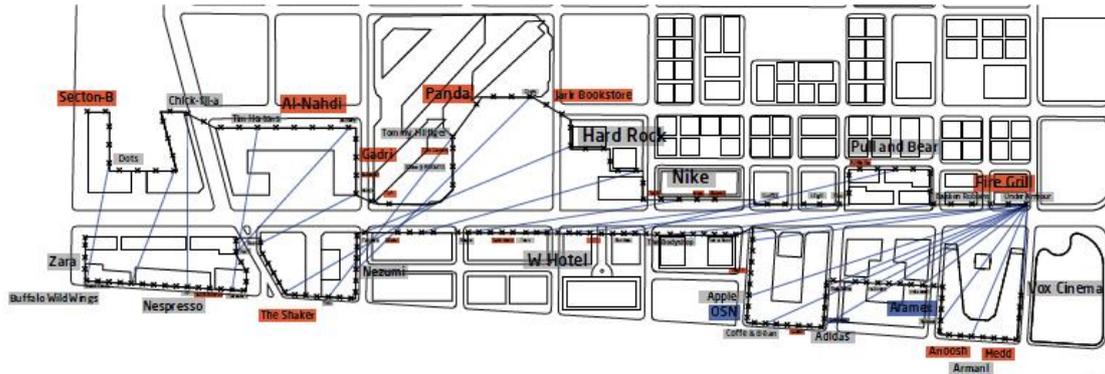


Source: Edited by Research Team

The increases in building height can proportionally augment the value of the site in the middle of the street due to increased density. The height peak was found to be in the middle of site and the incline was in equilibrium towards the two ends of the site due to the current density on the two sides and reduced density in the middle of the site.

According to the municipality regulations, Falastin Street is commercial; hence, the suggested new uses of the space include offices, clinics, restaurants and shops. Three types of cores can be used, depending on the size of the building and its needs, and the commonly used core is the central core due to its versatility. The definition has five scenarios, with each scenario containing random connections to both sides for branding, either by global or local brands, the last scenario (Figure 9) demonstrates the optimal connections in the main streets to attract a higher number of global brand stores.

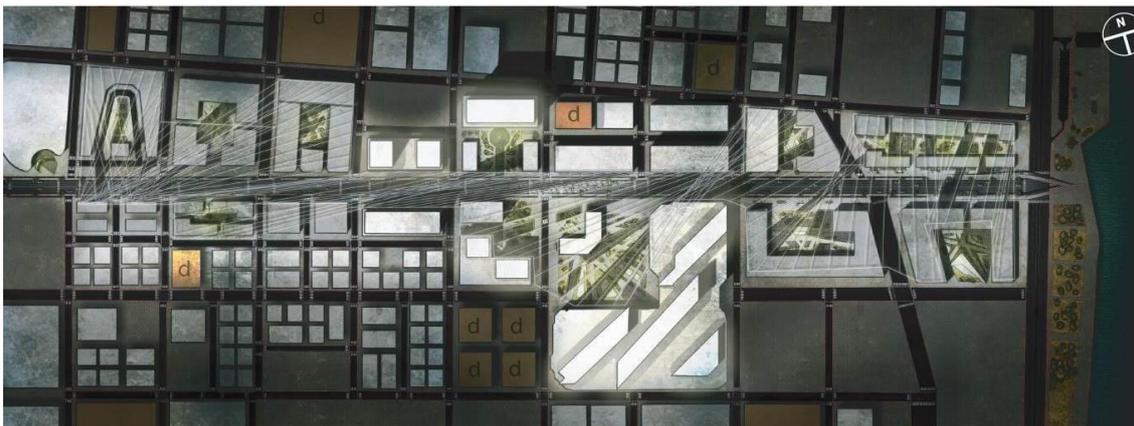
Figure 9. The last scenario with the optimal connections



Source: Edited by Research Team

Finally, based on the last scenario, the master plan of the street to improve its walkability is proposed in (Figure 10). The proposed distribution of public spaces in the area is designed to attract pedestrians to walk along the street.

Figure 10. The Proposed master plan of Falastin Street



Source: Edited by Research Team

5. Conclusion

In conclusion, the present study proposes several key recommendations to increase the value of the street and bring more vitality to it by employing a combination of principles of new urbanism and analytical methods such as social media analytical tools and Grasshopper logarithms. The proposed recommendations include adding more public spaces, promoting brand shops, and improving buildings' façades to enhance walkability on Falastin Street.

The assessment provided in this study may have different outcomes, depending on variables such as the role of policy makers and participation of the retail industry in implementing the suggested changes. However, applying even some of the strategies outlined could help to increase walkability and quality of space on Falastin Street.



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