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Reshaping the Urban Experience: Prospects for Digital Streetscape towards better Livability in Public Spaces

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1 ABSTRACT

As addressed through the literature on urban planning and design, urban livability concepts generally focus on the issue of "quality of life". Streetscape design is a good tool that can be used to create a sense of place and improve the urban quality. Thus, streetscape design and urban livability are strongly interconnected. But this connection needs desirable and attractive urban spaces that could interpret and reflect its richness. However, urban spaces are now exclusive domain managed almost entirely for traffic flow which makes them lose their distinctive character as places for people. Furthermore, with the continuous growth of internet usage, people's needs of public spaces have differed. These needs have to be specified. New possibilities of use and new atmospheres should be also created to cope with their new needs. Therefore, cities around the world are progressively working on developing new strategies to face the 21st century's challenges.

In this context, the paper raises the question of how urban spaces can be enhanced, depending on streetscape's improvements, to promote livability for its users. Based on the fundamental idea that streets are places for people more than just being arteries for traffic, the paper proposes the "Digital Streetscape" concept as a hybrid model that correlates the advantages of three techniques to meet the contemporary needs of people as well as to rejuvenate cities. On a broader level, the paper aims to conclude a set of guidelines and recommendations to improve the main elements of streetscape design that are derived from the theoretical study. This is carried out to identify the most suitable design concepts and options that can be adopted in the design of future urban spaces to produce new generation of livable communities.

Keywords: Livable Streetscape Design, Alexandria Livable City, Hybrid Approach, Digital Streetscape, Place-Making Concept

2 INTRODUCTION

High tech and high quality of life are the main pillars of any city aspiring to meet the challenges of the 21st century and restore its livability. In order to develop this idea, the paper follows the "Place-Making" concept as being relevant to understand livability (PPS, 2007). This concept considers livability as a coin that has two faces. People contemporary needs are one of them. Quality of places that have potential to meet their people's needs is the other. To be livable, cities must put both sides of the coin together.

Pedestrian-friendly streets are the city's most fundamental assets. The pedestrian movement is always considered as the most favorable type of human interaction with the urban environment (Blaga, 2013), but it takes more than just a good paving to produce an excellent pedestrian landscape. It is the whole environment arround the person that has to be understood.

Based on the pioneering study by professor Jan Gehl, a set of quality criteria for the design of the pedestrian landscape has been developed. It offers a way of looking at the environment based primarily on people and their human senses. These criteria are known as "The Twelve Quality Criteria" and are divided into three main groups: (1) Protection, (2) Comfort, and (3) Enjoyment. (Gehl & Svarre, 2013)

Nowadays with the continuous evolution of digital technologies, this set of quality criteria have been augmented. Thus, the paper proposes a hybrid approach that combines the highest urban design qualities with the latest digital technology. It focuses more on people who use the space, their needs, and pattern of use. This approach contributes to formulate a framework that correlates the advantages of three contemporary techniques: the Smart; the Eco-Oriented; and the Tactical Urbanism. Defining their concepts and dimensions as well as analyzing their interrelation with the concept of livability will help creating a new model of streetscape that has the potential to thrive in the 21st century. This model will be referred to as "Digital Streetscape". Implementing Digital Streetscape guidelines will reactivate spaces by creating

sustainable environments that react and interact with the passers-by which will help increase awareness for their movements in public spaces and thus foster their sense of place and provide better livability in cities.

3 LIVABLE STREETS

Starting in the 1960s, it was a turning point. Public life and the interaction with public space were pinpointed as a field to be more carefully studied. Leaders like Jane Jacobs, William H. Whyte and Jan Gehl began questioning vehicle dominance and its impact on individual life and the amount of social relationships developed. Donald Appleyard and other successors in the field started afterwards to link between the people oriented approach and the street livability (ARUP, 2016). Copenhagen has been the living laboratory for applying this approach from 1968 up to today. Its redesign was based on careful observations of people and their needs (Gehl & Svarre, 2013).

Taking copenhagen as an exemplary, many cities around the world recently started to wisely design streets as valuable civic spaces more than just car corridors because of the important role they play in forming the visual image and increasing the city livability. Improving these public spaces is the simplest way to improve the quality of life for all citizens as professor Allan Jacobs cited that "If we can develop and design streets so that they are wonderful, fulfilling places to be – community-building places, attractive for all people – then we will have successfully designed one-third of the city directly and will have had an immense impact on the rest." (PPS, 2008)

3.1 Streets as Public Places

Based on the UK's Manual for Streets, streets must be a destination in its own right to be called as "Places"; they must prioritize people's activities and give them a reason to go there several times. While streets in which the priority is for people's movement only, are just "links" that do not contribute to livability (PPS, 2016).

The image of the city and its attractiveness to visitors depends on its street life. A street with vibrant street life provides ample opportunity for social interaction. Successful places are where people not only feel safe and comfortable, but also experience a sense of ownership and community (Hill, 2012). The street life can be achieved when applying the transportation policy and design approach of "Complete Streets" used in the United States and Canada. Complete Streets approach inspires residents to view their streets as public spaces. It acknowledges the role they play in not only enabling circulation and making connection between important destinations, but also in encouraging and defining a vibrant community for all users of all ages and abilities, including people who walk, cycle, drive, or transit riders (IBI, 2013; SGA, 2018).

Then, Complete Streets become Livable Streets because both share same concepts, summarized in (Figure 1), that seek better integration of the pedestrians' needs into the roadway's design. This will enhance the pedestrian character of the street and provide a balance between all different modes encouraging a better quality of life and a greater range of community and street activity. Following the "Place-Making" concept and in order to strengthen the connection between people and the places they share, an effective Streets as Places process, that contributes to livable street environment and prioritizes people's health, happiness, and well being, needs to be planned and designed appropriately using four essential guidelines (PPS, 2018):

(1) Streets as Places promote sociability; they are welcoming and encourage the street life for diverse users groups of different gender, age, abilities, and income level ensure that no one group dominates the space and makes others feel out of place and unwelcomed.

(2) Streets as Places are comfortable and attractive; they create a positive image by keeping the place clean and well maintained as well as fostering a sense of identity. They must be protected against traffic and accidents, crime and violence, and unpleasant sensory experiences. They must also offer opportunities to a wide range of activities and interactions that elevate the behavior of users and their sense of place.

(3) Streets as Places promote vitality. They provide amenities to support a variety of activities; they give people the choice to do whatever they want to support their different needs whether they are alone or in groups and during different times of day, week, and year.

(4) Streets as Places are walkable and accessible; they are easy to get to and get through. They are shared streets where no one mode of transportation dominates and preclude the comfort of other modes. They also

encourage slowing speeds with a number of design tools including changes in widths, curvature, and intersection.
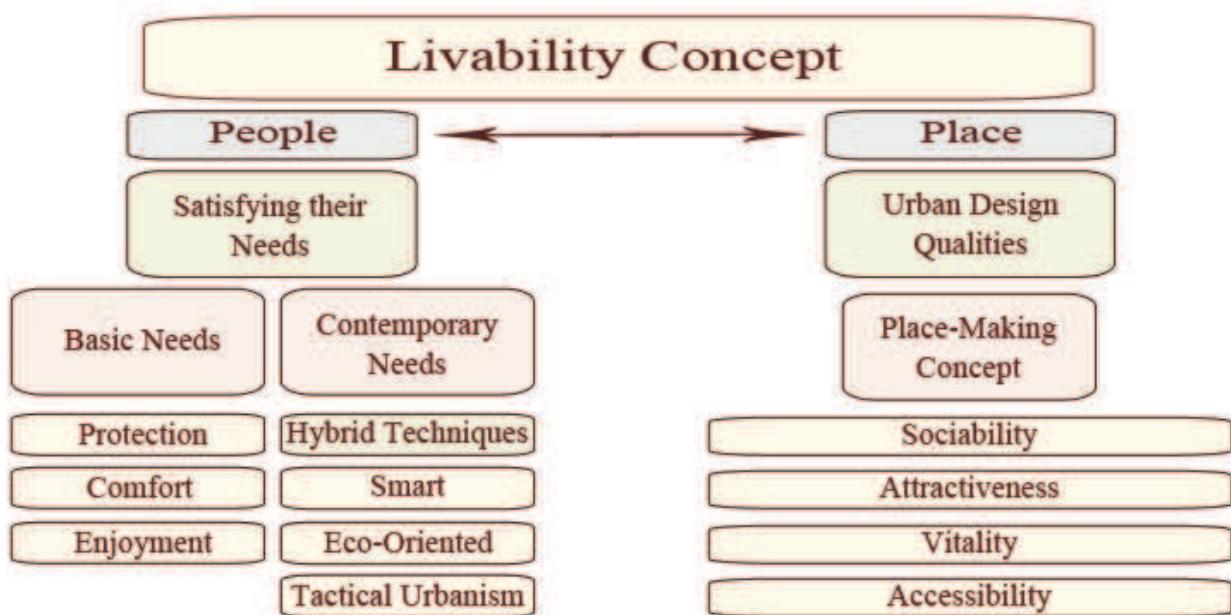

Figure 1: Flowchart summarizes the above concepts (The Researcher)

3.2 Streetscape Design Elements

The streetscape is the visual elements of a street that combine to form the street's character. It is one of the most important factors which helps in city success and tourist attractions by its strategic role in directing the movement of people and stimulating business and employment. Improving the streetscape can make the local environment more inviting, healthy, enjoyable, safe, and interesting and can create more livable communities (White, 2015). A successful streetscape design must take into account four basic principles, (1) legibility, (2) comfort and safety, (3) attractiveness, and (4) liveliness. The design of each streetscape element must ensure and enhance the legibility of the city and it must be functional and responsive to the needs and expectations of all its users. It must also be aesthetically pleasing and attractive, and to be designed to create lively spaces where people can meet and interact (Streetscape Management Section, 2007). Elements of streetscape are main components of a street's urban design. This paper will focus on three main elements as follows (Rockville Town Center, 2001; City of Cheyenne, 2007; Better Streets San Francisco, 2010):

3.2.1   Sidewalks

Sidewalks have a vital role in city life as they are an essential component of any pedestrian-friendly street system where pedestrians can experience safe, comfortable, legible, and attractive environment. Well designed sidewalks function as outdoor rooms and gathering places that can activate streets socially and economically, enhance connectivity and help define community character. This can be done through providing well designed and coordinated tree planting, lighting, street furnishings and paving materials.

3.2.2   Trees and Landscape Strips

Planters –either moveble or raised– help define and separate spaces and act as an effective treatment between sidewalks and streets that create a buffer from moving vehicles and street noise. They greatly enhance the pedestrian environment by softening the hardscape, providing shade and shelter, and fostering a vital connection to the natural world. When placed on a walkway, they should not create congestion or block pedestrian traffic, also their placement on street corners, crossing, and other critical areas should not obstruct drivers' view.

3.2.3   Street Furnishing

Street furniture is the most significant and influential component of streets' urban design. Benches, lighting fixtures, bus shelters, vendors' kiosks, signages, bollards, water elements, trash receptacles, bike racks, and public art considerably shape the nature of streets, public squares and entire cities. The placement and design

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of these elements should be consistent and coordinated in design, materials, colors and styles to avoid visual clutter and define spaces' identity and character.

4 "DIGITAL STREETSCAPE" CONCEPT

Based on the above concepts and classifications, the paper proposes an approach focusing on and prioritizing people and their quality of life. This approach aims to enhance the overall urban quality based on the contemporary needs of people. Streetscape elements are found to be the effective tool that can be used to achieve this aim. Taking into account the four basic principles of successful streetscape design, Streetscape elements will be augmented by a new layer that merge the three contemporary techniques: the Smart; the Eco-Oriented; and the Tactical Urbanism. This merging will create a new model of streetscape that has the potential to thrive in the 21st century and will be referred to as "Digital Streetscape".

4.1 The Smart Technique

This technique aims to transform urban landscape into a network of intelligent, hyper-connected, responsive, and virtual streetscape. Adding a digital subsystem to streetscape elements is the key of this technique. By using sensors, digital screens, Wi-Fi spots, and smart phones' applications, streetscape elements can be modified to better serve people's needs.

Debates surrounding the impact of technology on the usage and act of communication within public spaces raise the question of whether ICTs elements will promote livability in physical urban spaces or will they threatening it. One of the neglected public spaces in Alexandria City has been subject to an earlier study where the smart technique was applied as a tool to verify the application potential and added benefits of installing some ICTs elements in the physical urban space (Abdel-Aziz, et al., 2016). These elements are classified into four categories: (1) Wi-Fi spots, (2) digital interactive media façades, (3) interactive public displays, and (4) smart phones' applications. A conceptual 3D model for the redesign of the space is proposed based on analyzing the space and on people's opinions and suggestions derived from an On-Site Questionnaire to test the implementation viability of these elements and their influence on transforming the space into more active, vital, and interactive place with users.

For better results, the model is displayed into the Virtual Reality Cave (VR CAVE) where people enter wearing 3D glasses and can experience the 3D graphic concept, walk around, and get a proper view of what it would look like in reality. They were then asked to answer an evaluation survey to collect their opinions.
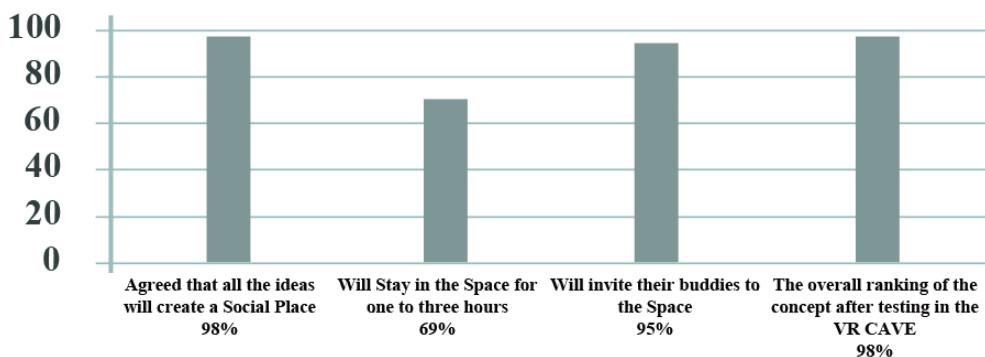

Figure 2: Graph shows the results of the earlier studies' evaluation, answered by 100 participants (The Researcher)

Taking into consideration the multiplicity of needs and pattern of use associated with diverse types of users, the survey's results in (Figure 2) prove that the use of ICTs elements in physical public spaces is so encouraged nowadays and that the digital technology has the ability to increase the attractiveness of the space and the interaction between people with each other as well as between people and the place around. Thus public spaces that take into consideration digital elements will foster the sense of place compared to those neglecting their implementation proving that the smart technique fosters the livability in urban spaces.

To create livable streets based on this Smart Technique, government interventions alone are not enough; it takes collaboration and partnerships between local businesses, institutions, and individuals. This could easily be done through a wide range of smart phones' applications that open lots of new options for participation

and citizens' engagement (Drohsel, et al., 2010). Thus, people will get more attached to their city because places will be designed according to their needs.

Some key design options and recommandations for installing the Smart Technique in physical urban spaces are illustrated in (Figure 3) and are provided as follows:

4.1.1 Sidewalks

The pavement can be improved using sensors that translate people's presence and movements into different forms of interaction. For example, a pavement that lightens when someone step on them or urban furniture that changes its color based on specific ways people use them, etc. Similarly, the well-known example of "the Piano Stairs" which is an interactive staircase that sounds like a huge piano when people step on it (CMUSE, 2014). Another interactive installation that uses light and sound to create a playful experience is the "Tangible Orchestra", exhibited at Royal Mile, Edinburgh. This installation encourages people interaction and playing within the space (Carvajal B., 2014). The "Sea Organ" in Zadar, Croatia is another attractive artistic installation which utilizes the power generated by the motion of sea to create beautiful sounds of music (villakatarina, 2018).

Digital projection on pavement can also be used to generate interactive spaces by changing the area's image, colors, dynamics, etc. Popular games like hockey can be transported into interactive digital games by projecting an interactive ball on the ground over a painted or projected game field (Reinhold, 2013).

4.1.2 Trees and Landscape Strips

Trees can be improved to be a source that generate art and culture in public spaces. Using string LED lighting or up-lighting fixtures, trees can be illuminated by different colors at night as a sort of public art which brings positive attention to streets and public spaces.

Digital projection can also be used on trees like what the french artist Clement Briend have done in Colombia showcasing godlike figures from the local religious culture (Reinhold, 2013).

4.1.3 Street Furnishing

Benches can be improved by offering outlets that allow users to simply plug-in their USB chargers to charge their gadgets at anytime of the day. The solar-powered rocking lounge chair "SOFT Rocker" created by Professor of Architecture at MIT, Sheila Kennedy, is a great example of this (Kennedy, 2011). Using sensors, benches also can be an interactive art in public spaces that raise awareness of art and create a place for playing and hanging out that brings together people of all ages. The canadian intervention by "Daily / Tous Les Jours", "21 Balançoires (21 swings)" is a great example of this (Cartiere, 2011).

Lighting Fixtures can be improved to be intelligent streetscape elements. Ron Harwood is the inventor of "Intellistreets", an LED street light system that goes way beyond simply lighting the streets by providing many options like WiFi connection, sensors that diminish its light in off-peak hours to save energy, and real-time environmental monitoring sensors to detect gas leaks, radiation, CO_2, etc., (Harwood , 2012). Another invention is the Light-Fiedlity (Li-Fi) which is a label for wireless-communication systems using light as a carrier instead of traditional radio Frequencies. Li-Fi is the latest technology that can provide the fastest internet speed so that it can replace the Wi-Fi (Verma, et al., 2015).

Bus Shelters can be improved using touching digital screens that offer usres a variety of services like bus route guide, digital city map, destination search, and traffic broadcasting station. As well as offering displays showing a virtual store with (QR) code to purchase and order goods while on move (Hwang & Choe, 2013).

Signages and Advertising Boards can be improved using digital displays in either passive broadcast mode showing playlist of videos and animation or interactive mode by touching the screen or enable the pairing of the mobile phone using bluetooth, QR codes, and SMS (Schieck & Fan, 2012; Ylipulli, et al., 2014).

Water Elements can be improved by the creative sensors use. The "Digital Water Curtain (DWC)" is cited as the urban furniture of the 21st century. The DWC is a type of fountain of new nature adapted to nowadays urban landscaping requirements being at the same time a playful, refreshing, eco-oriented, and iconic landmark in the urban landscape (Wan, 2013).

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Trash Receptacles can be improved using sensors that monitor when the receptacles are filling up and alert the sanitation department to empty them before they are full. This tend to make collecting waste much more efficient which means less hours and money spent on sanitation (Haggin, 2019).

Bike Racks must be provided for safe and secure parking to encourage bicycles' use. Smart bike racks "bikeep" is a San Francisco-based start-up that can increase the safety and security of parking by synchronizing the rack with a smartphone application. The rack also send an alert to the phone if someone tries to move the bike without proper authorization through the app (Smart Cities Connect, 2017).

Others view bicycle racks as an eyesore. The sleek alternative prototype "Align" by Milou Bergs pops up only when needed, the front wheel of the bike sinks down, raising a bracket to hold and lock the back wheel. When the bike is removed, it disappears entirely, hidden flat inside the pavement (Urbanist, 2018).

Public Art can be improved using digital technolgies in different ways to take it beyond the decorative elements to the functional elements. As presented above, all streetscape elements are suitable for artistic expression and can promote art in physical spaces when augmented by any digital subsystem.

Street Furniture in general can be adapted to help disabled people making their journeys easier and safer. Designers Ross Atkin and Jonathan Scott create the Responsive Street Furniture prototype. Users need to register with their smartphones, specify their needs whatever their disability: brighter street lights, audio information or more time to cross the street. Based on smartphones' connectivity, responsive street furnitures are able to identify users when they walk-by and adapt to their preferences (Howarth, 2015).
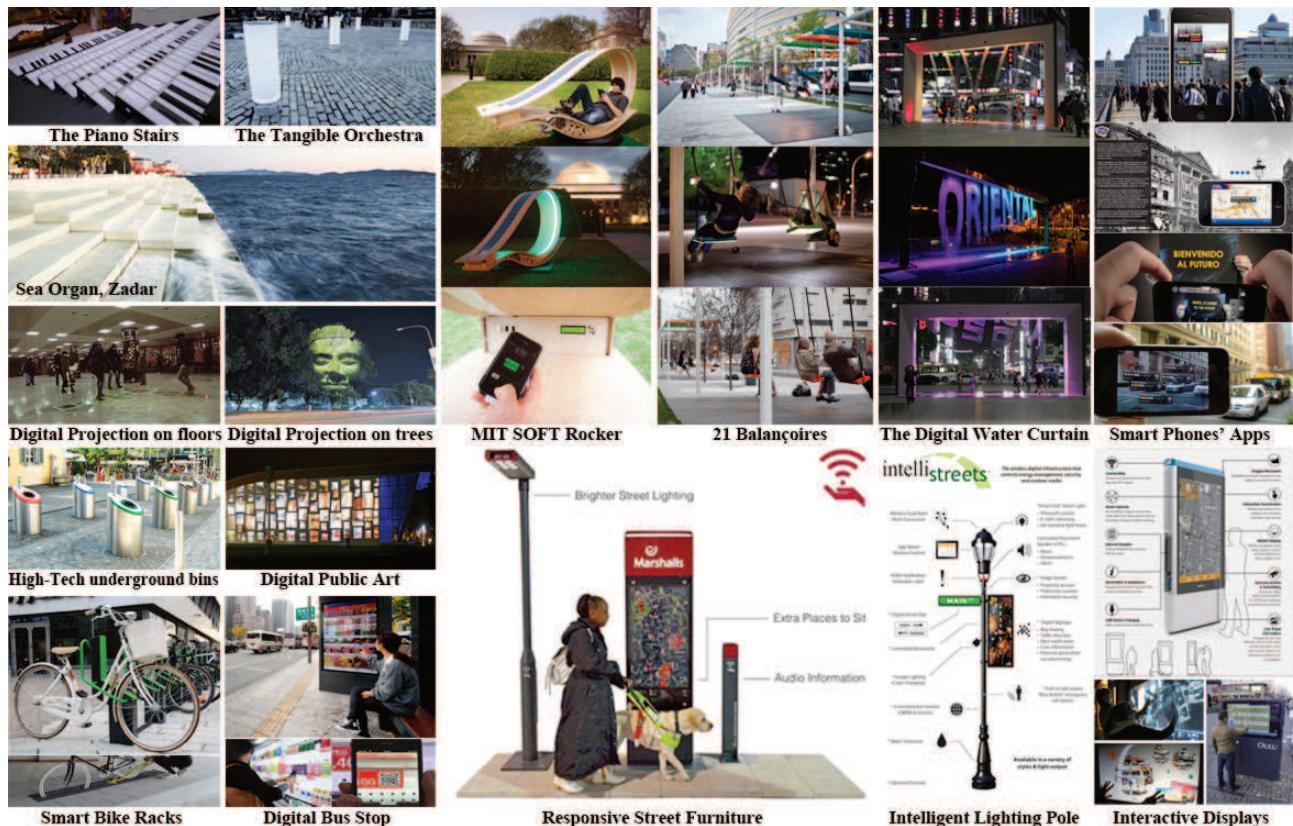

Figure 3: Illustrations demonstrate some options for installing the Smart Technique (Compiled by the Researcher, Sources are cited for each category respectively on pp. 5-6)

4.2 The Eco-Oriented Technique

The Eco-Oriented Technique mainly focus on the sustainable design options. Sustainable streets give priority to pedestrian, bicycle, and transit use, and also emphasize ecologically-friendly treatments. The treatments may include sidewalk widening, landscaping, traffic calming, sustainable materials, and other pedestrian-oriented features. In the U.S., a "National Streetscaping Week" is established to encourage the design of streetscapes that use sustainable design strategies to improve the environmental, economical, and social well-being of neighborhoods and communities (White, 2015).

Beside the four basic principles of successful streetscape design, and in order to achieve sustainability in streetscape, streetscape should consider the economical and environmental principles. Therefore, CH2M HILL COMPANY's Sustainable Street Design Options in the U.S. codified five main aspects to obtain sustainable street and then provided 161 options for design (Bevan, et al., 2007). These five main aspects are: (1) Reduce Energy Consumption, (2) Reduce Consumption of Material Resources, (3) Reduce Impacts to Environmental Ressources, (4) Support Healthy Urban Communities, and (5) Support Sustainability During Implementation. As the result of such aspects: the air quality, the water quality, and the energy efficiency are improved, meanwhile, the heat island effects, the light pollution, and the consumption of material resources are reduced.

Different cities around the world have applied sustainability on streetscape to create better places for present and future residents. Chapel Hill and Chicago in the USA both represent successful examples to apply many ways for achieving sustainabilty in streetscape, as: stormwater management, use of sustainable materials, lighting and dark skies, and landscaping and urban heat island (Rehan, 2013). These examples prove that the sustainable urban street design principles are considered as a pattern to adapt the livable street design.

Some key design options and recommandations for installing the Eco-Oriented Technique in physical urban spaces are illustrated in (Figure 4) and are provided as follows:

4.2.1 Sidewalks

Paving materials should be selected for sustainable manufacturing and permeability. Using locally sourced paving materials manufactured with sustainable practices will reduce life-cycle impacts on the environment.

Using durable materials will help to reduce maintenance costs as well as using cool pavements wherever possible will reduce the urban heat island effect. Paving materials should not pose tripping hazards for disabled people or cause excessive vibration for wheelchairs (City of Cheyenne, 2007). Materials and textures should reinforce distinctiveness and improve the appearance of the area as well as special paving treatments should be used in shared public ways (Better Streets San Francisco, 2010).

Paving can be improved by using solar cells that convert the sun's energy into electricity used to light up the entier space at night. The "Greeting to the Sun" in Zadar, Croatia is a unique example of an efficient and renewable energy source as well as an aesthetic enhacement (villakatarina, 2018).

4.2.2 Trees and Landscape Strips

Planters' locations should consider all other streetscape elements. Street trees should be large enough to provide shade for pedestrians and parked cars. They also should be hardy enough to withstand pollution, heat, glare and other urban conditions. Tree grates should be used wherever a tree is placed and should allow for tree growth and be made from recycled durable metal. Electrical outlets should be provided within the grate area to allow for lighting opportunities of greenery and flowers to be enjoyable at night. All landscape areas should be provided with adequate irrigation systems. Wherever possible, water runoff should be directed to landscaped areas for retention and percolation. These "Rain Gardens" could improve the esthetics of the sidewalks by including lush plantings with varying colors and textures (Rockville Town Center, 2001).

The Moss-covered City Tree bench designed by German startup "Green City Solutions" to combat urban pollution is the world's first intelligent biological air filter. Each bench is equipped with so-called "living wall", which is filled with a variety of moss types that naturally absorb pollution. The living structure also collects rainwater and automatically redistributes it using built-in irrigation system. Using Internet of Things technology, it is able to measure and maintain its own performance and the plants' requirements. The wall of irrigated mosses also generates a cooling effect helping to combat the urban heat island effect (Hitti, 2018).

4.2.3 Street Furnishing

All Streetscape Furnishing should be made of durable, environmental conditions resistant, non-abrasive materials that withstand cracking and require low maintenance. They should be crafted not sharp. They should be well illuminated to attract people at night. Energy saving LED light sources are preferred because they have a longer lifespan that minimize repeated replacement and reduce maintenance costs. As well as their design should add public art to the streetscape (Department of Transportation, 2013; IBI, 2013).

Some Streetscape Furnishing elements can be integrating together to form a new furnishing element with more advantages. The modular bicycle parking "plant-covered bicycle parking pod" is a great example of this. It is a new design concept that integrate bike racks with benches, greenery, a small vending machine, and advertising board all incorporated into the form of the parking in an organized way. The idea creates a piece of modern sustainable city furniture that offers a place for cyclists to safely park their bike, while offering a relaxation area for pedestrians (Inhabitat Staff, 2013). Same can be done for bus shelters.

Streetscape Furnishing can be improved using some innovative solutions like the Swiss company "Villiger" solution to deal with trash by using a system of underground waste disposal. They use high-tech underground garbage containers to save space and keep streets clean. Trash containers are stored below ground level to get rid of the smell and keep the trash out of sight which help reduce air pollution. This idea does not only serve for cleaner cities but also for more aesthetic surroundings (startupselfie, 2018). Another innovative solution is the concept design of the "Turbine Light" in Incheon Metropolis. It is designed to light up during the night using energy from the wind generated by moving cars. This by capturing the air flowing around the car to turn the turbine and therefore gain some renewable energy (Tak, 2009).

Figure 4: Illustrations demonstrate some options for installing the Eco-Oriented Technique (Compiled by the Researcher, Sources are cited for each category respectively on pp. 7-8)

4.3 The Tactical Urbanism Technique

Because of the confrontations that face cities in the 21st century, quick, low cost, temporary, community based, scalable, and creative interventions are needed in attempts to improve the condition of cities, thus the concept of Tactical Urbanism has been shaped. This technique refers to the concept of "Short-term Action || Long-term Change". Cambridge dictionary defines tactical as "relating to tactics or done in order to achieve something". Merriam-Webster dictionary added "of or relating to small-scale actions serving a large purpose" or "adroit in planning or maneuvering to accomplish a purpose" (Lydon, 2015).

In the context of cities, the Tactical Urbanism is a bottom-up process starts with the initiative of public participation, not through following official protocol. Tactical Urbanism gives the chance to test new concepts before making large political or financial investments, encourage people to work together, inspire action, low risk with high rewards and draw attention to perceived shortcoming (AbdElrahman, 2016). Tactical Urbanism starts with temporary interventions that can lead to the development of more permanent interventions over time. For example, in New York city, the department of transportation collaborated with local organizations in order to transform underused asphalt into temporary plazas for pedestrians, some of which became recently permanent (Yassin, 2019). Previous researches show the Tactical Urbanism as a creative technique and a benificial tool in promoting livability due to its guaranteed outcomes and benefits. Also, it allows the public to participate and visualize the streets creatively based on their contemporary needs.

Some key design options and recommandations for installing the Tactical Urbanism Technique in physical urban spaces are illustrated in (Figure 5) and are provided as follows:

4.3.1 Sidewalks

Pavment can be enhanced to foster inviting streets by adopting a Place-Making strategy that emphasize pedestrian needs through: (1) using barrier elements or colored treatments that separate sidewalks and plazas

from the roadway for safety, (2) using traffic calming elements like speed humps, speed table, and speed cushion and install ramps at all intersections as well as (3) creating more than standard crosswalk striping where pedestrian traffic is anticipated and encouraged which make motorists more aware of pedestrian activity and ensure safe pedestrian circulation, (4) applying medians help making a streetscape more pedestrian-friendly as they serve to separate opposing traffic, offer more space for planting, and provide a refuge for pedestrians crossing the road, and (5) simplify street closure permits to encourage a wide range of ways in which a city's streets may be utilized (NACTO, 2013).

Temporary street closures restrict a street to pedestrians at specific time of day, specific days of the week or during the year for certain seasons. They can take multiple forms ranging from an emphasis on active recreation, biking, or exercise to business activity, food, or arts (Lydon, 2016).

4.3.2 Trees and Landscape Strips

Movable inexpensive plants, trees, and other landcape amenities go a long way in making the street an inviting space to linger and socialize. They may be used to develop the underused asphalt into social and cultural places (Lydon, 2016).

4.3.3 Street Furnishing

Tactical Urbanism help people activate their streets by allowing projects in the streets and encourage public input for street furnishings. Movable chairs and tables are preferable. Shade elements should also be added in sunny/hot climates. Times Square is a successful example of turning a crowded street into a pedestrian plaza (Lydon, 2015).

Converting car-zones into public spaces is another option to increase the vitality of street life. PARK(ing) Day is an annual event where on-street parking spaces are converted into park-like public spaces. The initiative is intended to draw attention to the sheer amount of space devoted to the storage of private automobile that can be used for pedestrians' benefits when non in use like on weekends' days for example. Parklets also are public seating platforms that convert curbside parking into vibrant community spaces (Lydon, 2015; NACTO, 2013)

Curb extensions beside their role in visually and physically narrowing the roadway and creating safer and shorter crossings for pedestrians, they can also be transformed into interim public plazas using low-cost materials, flexible outdoor seating, and movable planters. Interim public plazas can reconfigure and revitalize any underutilized area or intersection that might otherwise be unsafe (NACTO, 2013).

The initiative of Bates College students is an example of a temporary protected bike lanes project in Lewiston, ME. This temporary intervention have led to permanent changes. Cities across the US have begun using a stepped approach to major redesigns, where temporary materials are used in the short term to be replaced by permanent materials after the public has tested the design thoroughly (Lydon, 2016).
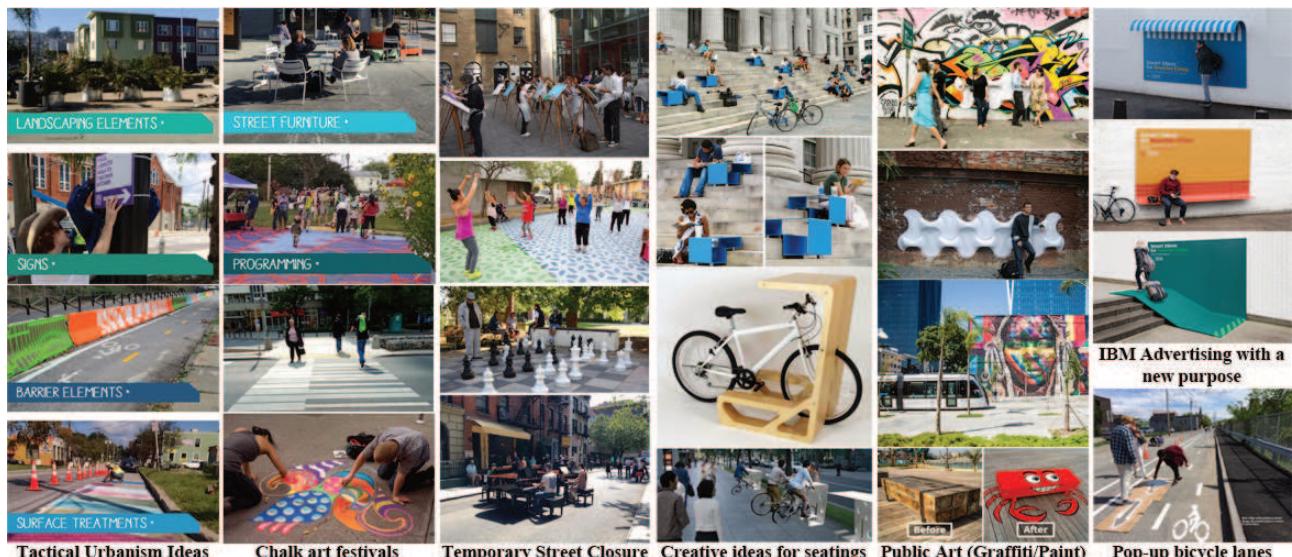

Figure 5: Illustrations demonstrate some options for installing the Tactical Urbanism Technique (Compiled by the Researcher, Sources are cited for each category respectively on pp. 8-9)

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5 FINDINGS AND CONCLUSION

Despite the breadth and complexity of Urban Livability Concept and also the conflict between cost matters and Eco-Oriented approaches however the paper was intended to focus on a limited set of issues which are connected and closely affect the quality of life and enhanced usability of public spaces from a qualitative perspective mainly. Moreover with the complex paradigms of Smart Cities and Tactical Urbanism, yet here makes an initial reference that they are increasingly being embedded in the notion of "needs" in a multiplicity of social context.

The following table, illustrated in (Figure 6), connects the Streetscape Elements with both the Basic Principles of Streetscape Design and the Principles of Urban Livability. This cross-relationship has provided sort of a matrix to evaluate the impact of each Digital Streetscape Element on improving Livability. The numirical value is based on observations carried out by the author. Where ticks appear they signifie a related/not related observation. The rating method is shown at the botton of the figure for clarity purposes and the rating points are calculated as basic numerical evaluation which are summed up together in horizontal order to reflect the extent of effect as a percentage.

Streetscape Elements	The "Digital Streetscape" Hybrid Model (Each Streetscape Element should provide the following guidelines)	Basic Principles of Streetscape Design — Urban and Social Principles				The Livability Concept based on the Place-Making Approach — Saticfying People's Needs — Basic Needs			Contemporary Needs			Urban Design Qualities of the Place				Total Evaluation of Livability	
		Legibility	Comfort & Safety	Attractiveness	Liveliness	Protection	Comfort	Enjoyment	Smart	Eco - Oriented	Tactical Urbanism	Sociability	Attractiveness	Vitality	Accessibility	Max. Points 55	%
Sidewalks	- Use Durable local materials, easy to maintain.	3	5	5	5	4	3	5		✔		5	5	5	5	50	90%
	- Use porous paving.									✔							
	- Use safe pavements' patterns and textures for disabled people.								▓	▓							
	- Separate Sidewalks and Plazas from the roadway.																
	- Use sensors for light/ sound effects.								✔								
	- Use Solar Cells wherever possible.								✔	✔							
	- Use Digital Projection whenever possible.								✔								
	- Allow Street Closures for (Games, Art, Music, and Exercises) events.										✔						
Trees and Landscape Strips	- Increase Green Areas.	3	3	4	4	4	4	5		✔		5	4	3	3	42	76%
	- Large Trees Canopies.									✔							
	- Rain Gardens.									✔							
	- Recycled water for irrigation system.								✔	✔							
	- Recycled and durable materials for tree grates.									✔							
	- Well lit the greenery.								▓	▓							
	- Digital Projection on trees.								✔								
	- Encourage Smart integration of benches and greenery.								✔	✔							
	- Encourage Public input for movable plants.										✔						
Street Furnishing	- Add Digital Subsystem to the Street Furnitures through - Smart Benches with Wi-Fi Connection, Sensors, Electrical Gadgets, Solar Panels, LED lighting.	4	5	5	5	4	5	5	✔	✔		5	5	5	5	53	96%
	- Intelligent Lighting Fixtures for both vehicles and pedestrians with cut-off Luminaire using LED Lighting system that enable Li-Fi Connection or using Solar Panels Lighting system.								✔	✔							
	- Highlight monuments and unique architectural details.								▓	▓							
	- Digital Bus Shelters with interactive Digital Screens, Virtual QR Store, and green shelters.								✔	✔							
	- Digital Advertising boards and signages.								✔	✔							
	- Interactive Public Displays that enable the pairing of Smart Phones.								✔	✔							
	- Digital Water Elements.								✔	✔							
	- High-tech underground Garabage Containers that include recycling waste separated containers and use sensors that monitor and alert when the receptacles are filling up.								✔	✔							
	- Synchronize Bike Racks with Smart Phone Applications for security.								✔								
	- Digital Public Art on media facades or Virtual Public Art using holography and Augmented Reality Applications.								✔								
	- Make all the Streetscape Furnishing Responsive to help disabled people.								✔								
	- Made all the Streetscape Furnishing with durable, locally sourced, high quality materials that require low maintenance.									✔							
	- Encourage Public input for "Movable Chairs, Tables, and Trash Bins."										✔						
	- Create Public Spaces at any underutilized area or intersection.										✔						
	- Support Graffiti Art on the street.										✔						
	- Encourage pop-up Bike Lanes.										✔						
	Rating (Points)					POOR (2) GOOD (3) VERY GOOD (4) EXCELLENT (5)											

Figure 6: Table shows the impact of Digital Streetscape Hybrid Model on improving Livability (The Researcher)

This model provides a tentative platform to consider, observe, evaluate, redevelop and intervene in public open spaces in a flexible and case sensitive way. For various context, it allows a track for integrating place specific attributes with planning goals and intentions. This allows the formulation of more responsive and sound approaches. However, this attempt is conceived as a pilot study which remain open and possible to be amended and readjusted with more/less streetscape elements on one side and principles of streetscape design and urban livability on the other. The cross-relationship and approach towards improving urban experience remains the same. Yet, it could better respond to local conditions and particular contexts in diverse cases. Through the right application and insertion, the hybrid approach is achievable, and it will have the potential to provide a different sense of engagement with the social and physical surroundings.

The ideas and outcomes of this paper are part of an ongoing study regarding urban space quality of Alexandria's Waterfront. They will be further verified through empirical studies and surveys involving samples of the public and various actors in order to establish clearer definitions and relationships. This in turn helps to gain more insight into how Urban Spaces can be improved to better serve the Contemporary Needs of People in terms of Streetscape and Livability.

To conclude, a visual diagram could be provided to illustrate the main idea advocated by this research (Figure 7). It explains the rationale and key principles utilized together in this study to fulfill the Hybrid Approach sought to reshape the Urban Experience.
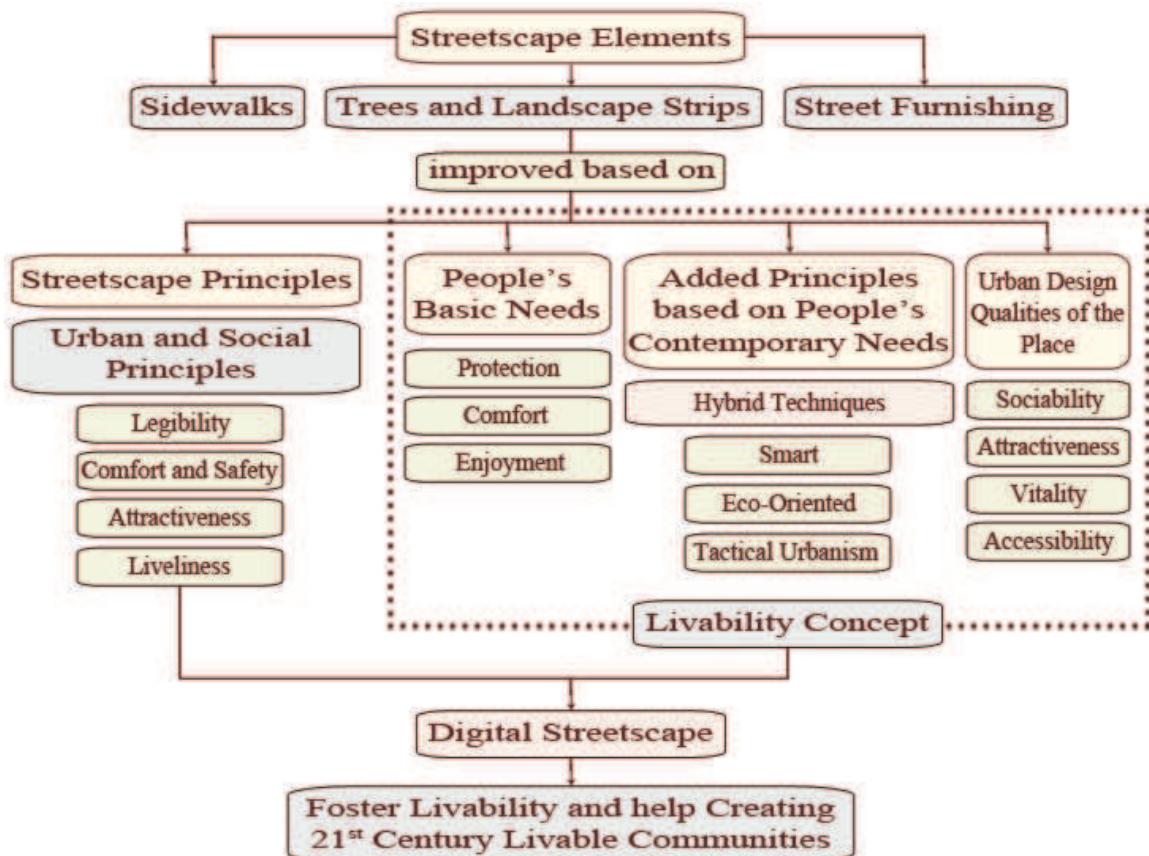

Figure 7: Flowchart summarizes the main idea of the paper (The Researcher)

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