

User-friendly Streets for a Walkable, Liveable and Sustainable Environment: A Review

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ABSTRACT

Streets are an important element of freely accessible public space and constitute the most significant manifestation of the public domain. They exist to cater for the social and leisure requirements of the public and have a positive association with economic development, public physical well-being and help establish an environment of communal bonding. It is therefore crucial that streets are friendly to all users, a public space which provides a liveable environment for pedestrians with a walkable environment that is inviting, safe, aesthetically pleasing, and equipped with sufficient pedestrian amenities. Thus, this paper aims to examine the physical design features and characteristics of user-friendly streets that contribute to a liveable environment. This review of the literature on liveability and user-friendly streets indicates that many factors influence the degree of liveliness and form and finds that the physical design and characteristics like Proportion and dimension, Sense of enclosure, Scale of street, Transparency, Unity and Quality of View. Also finds the qualities of a user-friendly street such as, Comfort and convenient, Safety and security, and Accessibility and linkages. All factors based on the purpose of physical forms and appearances, socio-economic and characteristics of both users and the residents. As such, a well-designed street environment is essential with the streets as 'public space' which can enhance their liveable environments in advance.

Keywords: Liveable; walkable; friendly street; quality of life

INTRODUCTION

DEFINITIONS AND CONCEPTS OF A STREET IN URBAN DESIGN

Firstly, there is a primary difference between a 'road' and a 'street.' A road is defined as "an ordinary route of communication between different places for travellers using vehicles" whereas a street is defined as "an enclosed space between two lines of adjacent buildings" (Moughtin 1992). Carmona et al. (2003), refer to streets as linear spaces bounded on opposite sides by buildings that may or may not have roads. In this sense, streets are people-oriented, catering to functional, social, and leisure requirements of people. It is important that streets are friendly to all users to provide a liveable environment for pedestrians.

Streets are considered among the most important components of an urban form that facilitate public and private activities of the city residents. Streets, much like parks are the most publicly accessible of all city spaces for all users. Thus, the characteristics of a street and its qualities must meet the needs of all users. In this paper, 'the street', is defined as "One of the essential elements in designing an urban space." Urban space is the space between buildings, space that is characterised by buildings, bounded by a

variety of elevations and not contained by buildings (Oktay 1990; Krier 1979; Sulaiman 2000).

This paper explains the motion of a "user-friendly street" in enhancing the liveable environment. The primary concern is to study the physical design features and characteristics of a street that contribute to friendly streets and liveability in urban areas. Tibbalds (1992:14) states that "we have actually got to address the restructuring of our urban areas, over possibly quite long time scales, to reflect a new set of priorities in which the needs of people - pedestrians, cyclists, the young, the old and the infirm, as well as the able-bodied take precedence over the various demands of traffic and developers" (Rahman & Shamsuddin 2010).

PROBLEMS

Streets are a significant part of the urban form and the most accessible of the urban spaces in a city. Globally, street issues have become an important topic as streets. Thus are integral parts of the urban environment with human concentration. In contrast, the urbanisation process has led to an increase in the urban population. The rapid growth of the urban population and the construction have had a very considerable impact on how the city dwellers and the social spaces are related.

Over the past century, the quality of the urban environment has steadily declined in many cities and become “inhuman” (Forsyth et al. 2008). The majority of urban areas globally have been overwhelmed and dominated by private vehicles, with drivers frequently ignoring the safety of pedestrians and particularly vulnerable users (children, people with a baby carriage, the elderly and handicapped) by ostensibly and selfishly claiming exclusive use of the street networks. This contributes to an unfriendly street environment for street users (Rahman & Shamsuddin 2010).†

Furthermore, a failure to understand the importance of proper urban design which takes into consideration the implications of providing adequate public spaces within the urban environment led to a significant reduction of such public spaces in many urban developments, thus depriving street users opportunities to enjoy safe and user-friendly, liveable and walkable environments (Rahman & Shamsuddin, 2010). Gehl (2007) highlighted the fact that in many cities globally, street quality has been significantly eroded by sidewalk interruptions, kerbs, dangerous street crossings, obstacles and other obstructions littering narrow sidewalks, thus inconveniencing with an unpleasant and unfriendly environment.

Tsourlakis (2005) reported that people are willing to walk more than they do today if public spaces could be improved. It is therefore crucial that the growing number of urban centres with rapidly increasing populations should be properly designed to ensure quality of urban life. Also taking into account the need to provide adequate public spaces that are safe, healthy and which will contribute to greater social integration and revitalize urban living (Rahman & Shamsuddin 2010). The major issue that needs to be studied and addressed is the relationship between the quality of life and the quality of the built environment (physical quality and social quality), which is one of the vital aspects that contribute to a people-friendly built environment.

The explanation above shows that it is important to create a street that is friendly to the pedestrian as it will create a safe and convenient environment for people to walk and establish social interaction. Therefore, this study will review the physical design features and characteristics of user-friendly streets that contribute to a liveable environment. This paper is organized in sections. The first section will explain how the user-friendly street is associated with a walkable, liveable and sustainable environment. The second section will explain the aim of this paper, the factors that contribute to the achievement of a user-friendly street environment.

USER-FRIENDLY STREET ASSOCIATED WITH A WALKABLE, LIVEABLE AND SUSTAINABLE ENVIRONMENT

Definitions of a friendly street revolve around a few studies in the literature, and include: “a street that is easy to use” (usability) (Oxford 2010); (an environment that “fulfills the needs of all users” (Tibbalds 1992); and “environmental

needs” (Shuhana 2000). It is “something to do with usability, accessibility and safety” (Yaakub et al. 2009); it is “User-friendly, facilitates a functional balance between human needs, environmental factors and financial constraints” (Shuhana et al. 2007). Allan Jacobs (1996) noted that the essential quality in urban public spaces is that they meet the needs of the users. The distinct qualities that the public space should have are safety (Whyte 1980; Jacobs 1961; and Carmona et al. 2003); comfort and convenience (Jacobs 1996 and Lynch 1981); and accessibility (Whyte 1980; Carrs et al. 1992 and Jacobs, 1996).

Shimitz and Scully (2006) were in agreement on the need for a pedestrian-friendly street design, which could help biological health and lifestyle changes and also improve their quality of life. This suggests that to design a walkable environment, it is essential to take in consideration better and well-managed streetscapes furniture with a strong character so that pedestrians will be able to enjoy walking comfortably in any part of the city. As such, from this perspective, planners or architects are required to innovatively create a space that is convenient to facilitate citizens to enjoy walking within an acceptable distance to make the city more liveable. Although the definition of a user-friendly street for this paper has been stated earlier, it is of importance to incorporate the notion of a user-friendly street in relation to a liveable environment (Figure 1).

According to the literature review, a user-friendly street is associated with walkability and walkable, which are often explained together. The term ‘ability’ is defined as “the fact that somebody or something is able to do something” (Oxford Advanced Learners’ Dictionary 2010). Walkability and walkable are also represented as a scale that something is “Walking Friendly”. Llewelyn-Davies stated that walkability is defined by “the level of pedestrians’ comfort and safety, such as the existence of casual surveillance, spaces between pedestrians and vehicles as well as high quality connected pedestrian pathways” (2000 in Shamsuddin et al. 2004). The ongoing trend for cities is to modify the urban form to promote walkability in two ways, which are: form building by defining streets and the existence of squares adjacent to building pavilions (1996; 1998 in Carmona et al. 2003). Therefore, a city should also make available connecting street networks and upgrade pedestrian-friendly street designs (Stephen 2004).

Besides the walkability, a user-friendly street is also associated with the concept of a liveable environment. Oxford Advanced Learners’ Dictionary (2010) defines liveable as “fit to live in.” EIU (2011) definition of liveability describes it as “one of the aspects that could contribute to a high quality of living.” Liveability and vibrancy of the built environment are being more frequently and universally discussed. For example, The Singapore Centre for Liveable Cities (2011) defines liveability as a “city through good planning, provides a vibrant, attractive and secure environment for people to live, work and play and encompasses good governance, a competitive economy, high quality of living and environmental sustainability.”

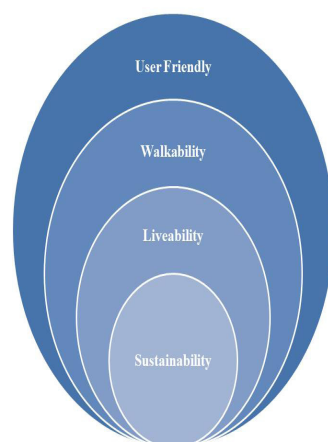


FIGURE 1. Sustainability, Liveability and Walkability connection; Source: University of Wisconsin Transportation Analysis Team (2011) "edited by the author"

According to Jacobs (1996), liveability is "the physical quality that is required to make a great street." Liveability is part of the sustainability concept which comprises six different objectives and components. One of the aims is to attain the transportation sector's goals like the promotion of walkability, providing greater accessibility and more transportation choices (VTPI 2010). Therefore, this suggests that walkability is an aspect of the liveability component in improving the sustainability of the environment and in the creation of a liveable place. Liveability is a theory that relates to the user-friendly street. It is natural that every public street will expansion at those crucial nodes where there is the most activity (Alexander 1977).

In conclusion, a user-friendly street is a street that fulfils the needs of its users through the quality of the built environment in terms of physical, functional, social quality and meaning. This discussion explains the concepts of user-friendly and related theories, as well as the current body of knowledge concerning the main attributes and characteristics that determine a user-friendly street. The conclusion will summarise the key attributes as identified in the literature.

FACTORS THAT CONTRIBUTE TO A USER FRIENDLY STREET

Studies have found that a user-friendly street relates to three main theories (inclusive environments, responsive environments, and liveability). The Theory of Inclusive Environments of a street implies ease of access; safety and usability are the essential elements that frame the inclusive design (Yaakub et al. 2009). Burton et al. (2006) stated that inclusive design means the design of products, services and locations that would be beneficial to the maximum number of people. For a street, inclusiveness means a street that is useable by all groups of people, no matter of what age and ability. Users of the street environment are all those interested in their local environment and streets (Burton et al. 2006). For responsive environments, Bentley et al.

(1985) argued that the built environment must provide its users a basically democratic setting, which enriches their opportunities by optimising various available choices for them. A 'responsive' street is a street that has permeability, variety, legibility, visual appropriateness, personalisation and richness (Bentley et al. 1985). Liveability is another theory associated with a user-friendly street. According to Jacobs (1996), liveability is the availability of the physical quality that is essential for making a great street.

This review found that two main factors contribute towards a user-friendly street environment. Consequently, are (i) the physical design and characteristics, and (ii) the qualities (as shown in Figure 2).

A study of physical design and characteristic of a user-friendly street can be divided into three parts, namely, proportion and dimension, sense of enclosure, scale; transparency; and unity; quality of view.

PROPORTION AND DIMENSION, SENSE OF ENCLOSURE, SCALE

A friendly street must have proportion and dimension. In creating street proportion and dimension of the width and height in the street, there must be ease of movement, safety, sun, wind flow and military access which contribute to a user-friendly street (Jacobs 1996). However, the context of proportion and dimensions comprises the factors that need to be determined whether or not they are relevant and vital concerning the use of the street.

Sense of enclosure is another physical quality that a street should have in order to be a user-friendly street (Oktay 1990). Cullen (1961) defined enclosure as a space that provides a completely private sphere, which is inward looking, static and self-sufficient. The height and width ratio contribute to the level of enclosure for streets and a street in its physical sense of enclosure is defined by the series of buildings on both sides, where the ratio of the width of the street to the height of the enclosing buildings is vital for good street design (Moughtin 1992; Abdallah 2009). This indicates that the height of buildings, the width of the street and the continuity of the buildings along the street are

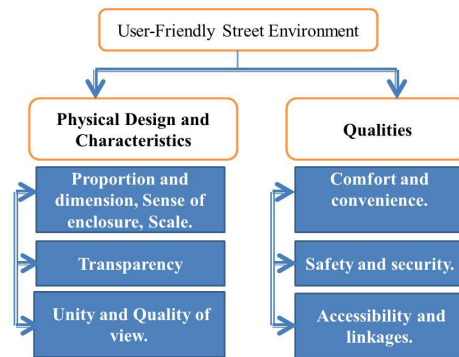


FIGURE 2. A diagramme shows two significant factors that contribute towards a user-friendly street environment

the main aspects that provide a sense of enclosure. This is considered significant in a user-friendly street.

Scale is related to sense of enclosure and sense of place. Scale is dependent on the comparison of a set of dimensions with another set; the relation of constructing an urban space to the size of human beings is vital to achieve a ‘sense of place’. Spatial quality also depends on the scale of the unit, understood as ‘human scale’ and is related to the ratio of height to width measured along a section line (Oktay, 1990).

TRANSPARENCY

The great streets have about them a valuable characteristic of transparency at their edges and the public field of the street (Jacobs 1996). Transparency is essential to give a sense of comfort and safety to the users on the street. Lynch (1981) argued that transparency is the quality of the street that people can directly observe the execution of different technical functions, activities, social and natural processes that take place in streets that convey a sense of life. Shamsuddin (2011) added that most of the modern buildings nowadays withdraw from the street, thereby shutting the activities within that allows the street to cease to function effectively and causes the townscape to become alienated (Shamsuddin 2011). Therefore, transparency is important to ensure that the activities that happen indoors are visible to outdoors and vice versa.

UNITY AND QUALITY OF VIEW

Unity is also an important physical character of streets. Allan Jacobs (1996) suggested that the buildings in the street are compatible with each other even though they are different but express respect for each other in height and in appearance. Gibberd (Moughtin 1992) argued that the street is a space in which the users are assorted to form a series of street images that may be extended into vaster spaces like squares.

A friendly street must have a quality of view. Rapopor (1976) suggested that physical differences, such as shape size, height, colour, materials, texture, details, location and movement, must be noticed by the perceiver. Therefore, the use of common materials, details and architectural elements

strengthen the unity and the quality of view in many street scenes.

QUALITIES OF A USER FRIENDLY STREET

The qualities of the streets are crucial so as to draw people to them. Jacobs (1996) noted that a basic quality of urban public space is its ability to meet user needs. The qualities of the street and other public places that encourage people to use the spaces according to previous studies are used as qualities of the street associated with a user-friendly urban-commercial street. In this paper, the qualities discussed are those most frequently quoted by various scholars. The summary of the qualities, as determined by different scholars, established that the most commonly cited qualities linked to a user-friendly street are: comfort and convenience; safety and security; accessibility and linkages. This is supported by the Project for Public Spaces (PPS) (2005), which identified the qualities that make a great place by four key attributes: uses and activities; comfort and image; access and linkages; and sociability.

COMFORT AND CONVENIENT

In order for a street to be used and be the best place to walk, the street must offer a ‘sense of comfort’ and be pleasing (Jacobs 1996). However, for urban streets, comfort implies the extent to which streets allow people to go where they wish without subjecting them to physical and mental discomfort. Comfortable streets offer a sense of calm, are hospitable and pedestrian-friendly with the required amenities and services (Burton 2006). Comfort is a quality of a prosperous street and a measure of a good street (Carr et al. 1992; Jacobs 1996; PPS 2005; Carmona et al. 2003). Carmona et al. (2003) argued that the quality of comfort is associated with environmental aspects, physical, social and psychological comfort as shown below in Table 1.

SAFETY AND SECURITY

Perception of safety is a frequent and typical concern and a reality in all urban spaces that cannot be denied as one

TABLE 1. Comfort and convenient

Attributes	Key Factors
Comfort and convenient	Safe, clean, 'green', walkable, sittable, charming, attractive and historic

TABLE 2. Safety and security

Attributes	Key Factors
Comfort and convenient	Safe, clean, 'green', walkable, sittable, charming, attractive and historic

TABLE 3. Accessibility and linkages

Attributes	Key Factors
Safety and security	Fear of traffic/accidents, Fear of crime, Fear of dark

of the factors in comfort. According to Burton, (2006), safety is a fundamental feature of streets for life. Safety implies people being able to walk, work and live without fear, day and night; without fear of meeting strangers on the street; walking alone and with ease of mind; no fear of crime; a feeling of security; and individuals feel at ease within a diverse mix of varying physical motifs and social exchanges (Talha, 2008). However, Safety implies streets that encourage people to use, enjoy and move all over the external space and not having to worry about tripping or falling, being knocked down or being mugged as shown below in Table 2.

ACCESSIBILITY AND LINKAGES

Accessibility is also a fundamental aspect of the street and an essential performance element of urban space and the people that use it (Lynch 1981; Jacobs 1996; Carr et al. 1992; Making Places Newsletter 2005). Accessibility refers to streets that allow the users to access, enter, use and walk to wherever they wish to go; streets that can be easily accessed offer local services and amenities, are conveniently interconnected to each other (persons, services, resources, activities, location indicators and directories), have broad, flat pathways and safe ground level pedestrian crossings with adequate signal controls (Lynch 1981; Burton 2006) as it shown below in Table 3.

Based on the literature, the factors and attributes of the physical, functional and social dimensions are significant to create a user-friendly street in an urban area. The results of the friendly street can be known through the way the physical and functional elements are related on the street and also through the human response. Thus, the interrelations between all these aspects are crucial for a user-friendly street.

CONCLUSION

In summary, to create a street that is a prosperous urban public area to enhance the liveable environment from the perspective of sustainability; need to good understanding of the physical design characteristics and qualities of the user-friendly street is the most important. Several ways exist in which urban designers, planners and policymakers can act to support the quality of the street and create a friendly street. The designers must understand the current need of users and create places that have qualities and characteristics that can meet the needs of all users. This paper shows that a walkable environment results in a liveable environment of a city by encouraging the design of user-friendly streets. Finally, it is suggested that in the creation of a liveable street environment, care should be taken to make sure that the streets are clean, safe and inspiring; all the qualities mentioned previously should be presented.

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DECLARATION OF COMPETING INTEREST

None.

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