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The Design of Spaces to Determine the Sustainability

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Abstract

Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. Ideally, humanity will redefine itself, its placement in nature, and refine the role of technology within the environment. In order to know the level of satisfaction of the city design, the 'Sustainable Development Indicators' been used. It refers to the aspect that need to understand which related to the urban design theory especially for the 'street indicator'. This paper is to measure and compare the sustainability of 2 town centers by applying 'Sustainability Development Indicators' (SDI) by focusing on the street indicator. The objectives are to describe the tool and show of applying it in comparative assessment of 2 town centers and to determine how the built environment impacts the social wellness by focusing on the 'street indicators'. The finding shows that Petaling Jaya New Town is more sustainable than Petaling Jaya Old Town in street indicators. General recommendations are propose several elements such as street furniture and parking. Therefore, Local Authorities should play an important role in ensuring the sustainability of a cities that can be formed with the availability of guidelines or policies that are appropriate for planning permission.

Keywords: Sustainable, Sustainable Development Indicator, Street Indicators.

Introduction

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations (World Commission on Environment and Development, 1987). A new town, planned community or planned city is a city, town, or community that was carefully planned from its inception and is typically constructed in a previously undeveloped area. This contrasts with settlements that evolve in a more ad hoc fashion. In Malaysia, there are 2 different types of town namely old town and new town. The new town can be describe such

the planned city where such as Putrajaya, Cyberjaya, Shah Alam, Petaling Jaya (New Town) and the Multimedia Super Corridor. Meanwhile, the old town is known for its well-preserved colonial core, with original shop houses dating from the 19th century to the 1930's (Tjoa-Bonatzordering, 1998). New and old town is seen as the most suitable for this study because it requires evaluation of the comparison should be done to identify new town areas or old town is more concerned about sustainable.

This research is to measure and compare the sustainability of 2 town centers by applying 'Sustainability Development Indicators' (SDI) by focusing on the street indicator. The objectives are to describe the tool and show of applying it in comparative assessment of 2 town centers and to determine how the built environment impacts the social wellness by focusing on the 'street indicators'. Two suggestion such as in the physical aspect and also in policies and guide lines that will be as the main action or subject to improve the certain issues that has been arised. Meanwhile, the overall finding shows that Petaling Jaya New Town is more sustainable than Petaling Jaya Old Town in street indicators. The significant of the study is based on the tool of 'Sustainable Development Indicators' which the chosen concept is 'Street Indicators'. This concept is useful because it allows planners and designers the ability to breakdown the design of a street and/or neighborhood to determine the positive and negative attributes.

Sustainable Development Indicators (SDI)

Based on Porta and Renne (2005), Sustainable Development Indicators (SDI) is divided into two (2) indicators such as 'Urban Fabric Indicators' and 'Street Indicators'. Both indicators are the process to define how to represent the space and to measure the presentation used plans, bird-eye-view and sections.

i) Urban Fabric Indicators

The scale of a district or neighbourhood is measured using urban fabric indicators. It assumption that 'traditionally' designed town centers or suburbs are most sustainable in respect to the social equity, economic stability and the protection/ enhancement of the environment, compared to 'conventionally' designed places. There are eight (8) indicators of the urban fabric, including:

a) Accessibility (Pedsheds)

Pedshed or walkable catchment enables an assessment to be made about the interconnectedness and accessibility of the street network for pedestrians. The pedshed shows the percentages of the circle that is truly accessible based on safety, sidewalk connectivity and street layout.

b) Land Use Diversity

Land use diversity measures the variety of land uses within the walkable catchment area. A high value of diversity may increase consumer choice a greater degree for maintaining an urban lifestyle without increasing the need for motorized the movements.

c) Public/ Private Realm

Public realm identifies where the public can or cannot go (where the public cannot readily access 24 hours a day). The public domain area are places that individuals are free to go to at

any time and may include public parks and open space, streets and sidewalks, and public parking lots.

d) Natural Surveillance (Fronts and Backs)

It is provides an increased security for the pedestrian due to the feeling of 'eyes on the streets' (Jacobs, 1961) and enhanced capability of territorialization for inhabitants and users (Newman, 1973, 1996). Front and back mapping will identifies areas of streets that have active building frontage, which helps to promote a better natural street surveillance.

e) Permeability (Street Connectivity)

The type and number of intersections in an area effects the movement by users in that given space and the user legibility of the street network. Four-way intersections offer both physical and visual directness of movement to a destination. T-junctions give the reduced choice in movement and force a change in direction. Cul-de-sacs are highly undesirable because they disrupt the flow of movement.

f) Employment Density

Employment density refers to the average of floorspace (in sqm or sqft) per person in an occupied building. It is therefore a measure of how much space each person occupies within the workplace.

g) Number of Buildings and Numbers of Lots

The final elements in this indicators help to give an indiction of the scale of the measurement area. Resulting of the figures show the different of street lay-outs generate quite different perfomances as for both the number of stand-alone buildings and the number of lots.

ii) Street Indicators

Street indicators help to isolate the individual components that either add or subtract from street vitality. These indicators also can be used to improve the vitality of a street. There are eight (8) elements in this indicator:

a) Sky Exposure

Sky exposure is the amount of sky visible in each photograph, where trees are considered as opaque, the same as buildings or other permanent man-made objects. This measurement seeks to understand the urban environments' ability to encapsulate the pedestrian. The designer can relate this information to the person's sense of intimacy through enclosure, their sense of livability (the street becomes like a living room), the sense of orientation and definition in space and their sense of security.

b) Facade Continuity

Facade continuity is a measure of the continuousness of the building façade on a place that follows the line of sight. The continuity of building fronts adds to a sense of enclosure and definition of the public space. As such, this indicator could be seen in close relationship with the sky exposure indicator, as a component of street intimacy. This indicator also examines the building fronts as a precondition for establishing a good relationship between the private space and the public space of streets.

c) Softness

Softness measures the subjective elements that make a street environment feel safe and welcoming. This is a compound indicator: the two elements are transparency and transitional space. Transparency is a measurement of the amount of window space/area that fronts onto the street, allowing viewing into and out of the buildings. Transitional space is a measurement of spaces – visually accessible front yards, stoops, porticos, verandas, shelters, entry setbacks, balcony awnings, or the like – that provide a 'soft' transition from the very private space to the public realm. Transparency and transitional space are measured independently and then averaged to get an overall measure for softness.

d) Social Width

Social width refers to the breadth of the street as it affects human interaction across the traffic area. This is a measurement of the restriction ('severance' effect) that traffic lanes and multi-functional lateral or median strips (parking strips, bike lanes, each) place on human interaction from one curb of a sidewalk to another. It also measures the interaction between people and activities taking place mainly at the ground floor of fronting buildings.

e) Visual Complexity

Visual complexity is a measurement of the amount of variety in the streetscape. It seeks to describe the degree that the street is a rich visual tapestry. The multi-dimensional nature of a concept of 'visual variety' is best evaluated in four different sub-areas such as color, facade, street furniture and street pavement.

f) Number of Buildings

The number of buildings refers to the apparent quantity of buildings visible in the pictures. It is a very simple measure of the 'scale' of the city, a factor which in many ways affects the street life, as many buildings often imply many entries, many windows, many different people and activities.

g) Sedibility

Sedibility is the measurement of the number of seating opportunities visible in each photograph (example benches, low walls, cafe chairs, each). To measure this, a distinction is made between primary and secondary seating. Primary seating constitutes objects are made for people to sit on which include benches and chairs (moveable chairs were given a slightly higher rating). Secondary seating opportunities are objects not specifically made for the purpose of seating but on which people are very likely to sit on. This includes walls, stoops, fountain borders, ledges, planters and others.

h) Detractors

Detractors refers to any element that can be viewed as having a negative effect on the streetscape potential to provide a good scene for the flourishing of urban social life. These have been broken down into three sub-indicators including: blank walls, aggressive automobile facilities, and rejecting objects.

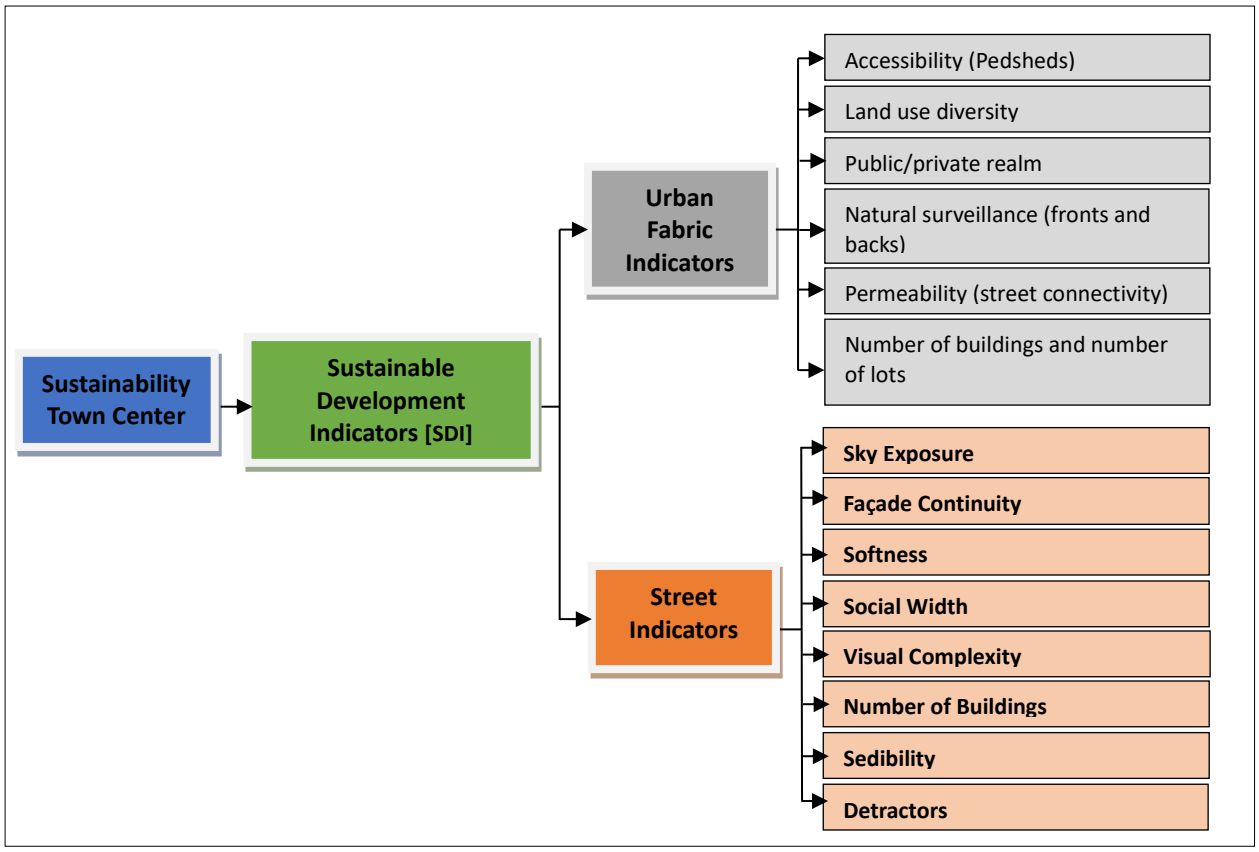

Figure 1. Indicators for measuring the sustainability for town center (Porta and Renne, 2005).

Methodology

Data and information obtained from the primary analysis process conducted from field observations during the study. The analysis performed was based on the observation made in the two cities for a different pattern of development for both towns (Petaling Jaya New Town and Petaling Jaya Old Town). This research, only focus in zoning analysis (macro stage). In this analysis, it recorded the functional of the streets and also describe the data that had been shown in pie charts. The study is more focused on the 'Street Indicators' that had 8 elements that needed to observe.

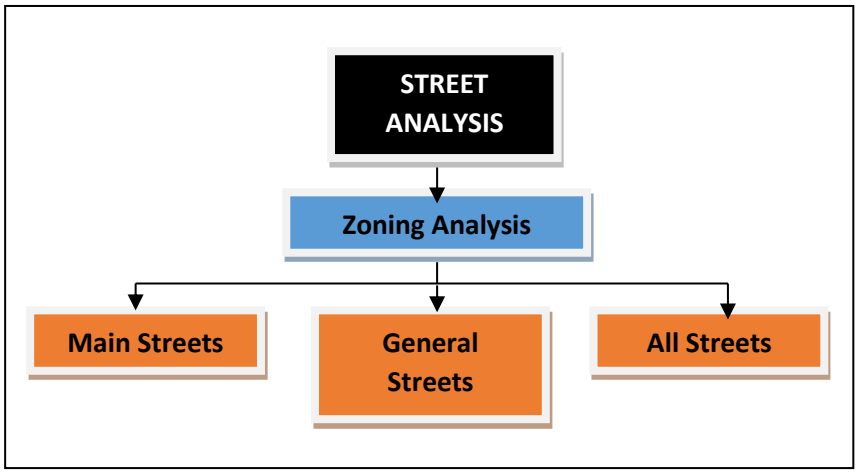

Figure 2. Analysis Stages (Porta and Renne, 2005).

Analysis Application For Street

Analysis of application for street indicators is represent the comparing result between streets indicator for 2 towns, there are Petaling Jaya New Town and Petaling Jaya Old Town. From the charts, it can show the different percentage from 8 indicators and from it also, it can get either Petaling Jaya New Town or Petaling Jaya Old Town is more sustain. It will devided into 3 category namely as main streets, general streets and all streets because it will showed the detail about those 8 indicators.

i. Main Streets

Based on the analysis of application for street indicators that been done, noted that Petaling Jaya New Town has great potential and the percentage of the number of building indicator (27%). This is due to the availability of the strategic location in providing mixed activities to the city. The lowest percentage is for facade and social continuity width (respectively 6%). This is due because there are many buildings and most free-standing building offers clustering parking system resulted of parking problems that occur in Petaling Jaya Old Town. Meanwhile, in Petaling Jaya Old Town a percentage of the number of building has the highest percentage (29%) because of high quantities for housing units. The lowest percentage number is for the social width indicators (5%). This is attributed to the main roads in Petaling Jaya Old Town that is more directed to bring the users expand their activities outside the town. This is because of the compact development.

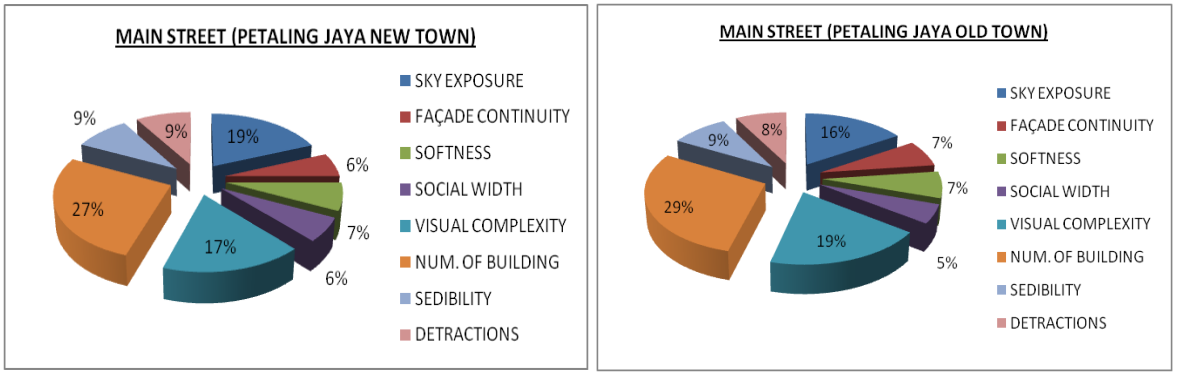

Figure 3. Application of Street Indicators for Main Streets in Petaling Jaya New and Old Town

ii. General Streets

Petaling Jaya New Town has a high percentage is the number of building indicator (32%). High percentage is due to the general position of the streets within the city. Besides that, it is a major road connecting to the streets in urban areas. In addition, the visual complexity and the sky exposure are also having good percentage of 16% and 14%. This is due to the beautification that has been done by the responsible parties for creating a sense and a more view defined for harmony environment. For lower percentage of indicators are softness (6%) and facade continuity (6%). This is due to the big numbers of free standing building.

At the Petaling Jaya Old Town, the highest percentage is the number of building by 26%. Followed by the visual complexity (17%) and sky exposure (16%). Some of the following indicators are based on the beautification of the city and stated buildings that were available in the city. The poor percentage is for social width indicators with (6%). This is due to the lack of land or the development of the compact development in Petaling Jaya Old Town.

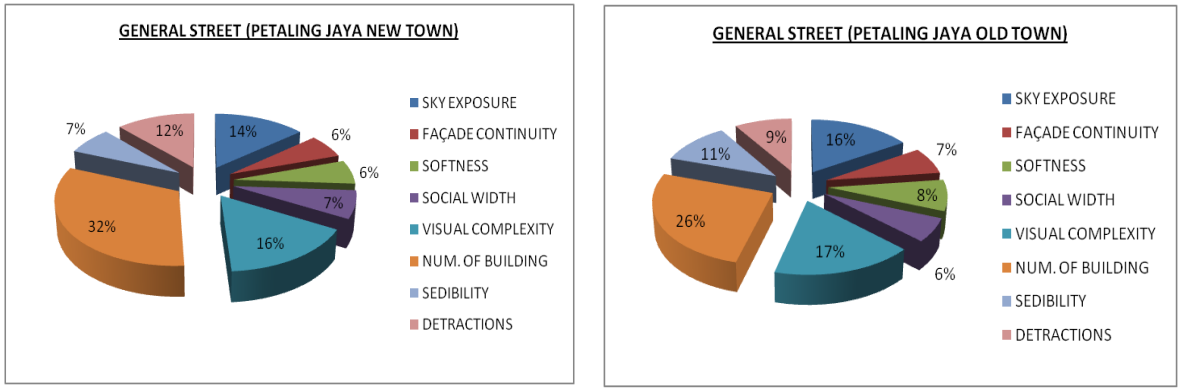

Figure 4. Application of Street Indicators for General Streets in Petaling Jaya New and Old Town

iii. All Streets

The highest percentage of all streets in Petaling Jaya New Town is directed to the number of building indicator (27%). This was followed by the visual complexity (19%) and sky exposure (16%). The results are equivalent to the results obtained through the main streets and general streets. Less percentage is recorded for softness indicators (6%). This is because the activity and functional of the streets in the city that made the lane behind the building as all of one-way streets and routes. This will reduces the rate and should be improved through the beautification of whether or alteration of the route.For Petaling Jaya Old Town, the highest percentage recorded in number of building indicator (24%). It is followed by the sky exposure and visual complexity, respectively for 19%. If included, almost all of the streets in Petaling Jaya New Town and Petaling Jaya Old Town is more emphasis on the beauty of buildings and beautification of landscape to provide the tagging of the city.

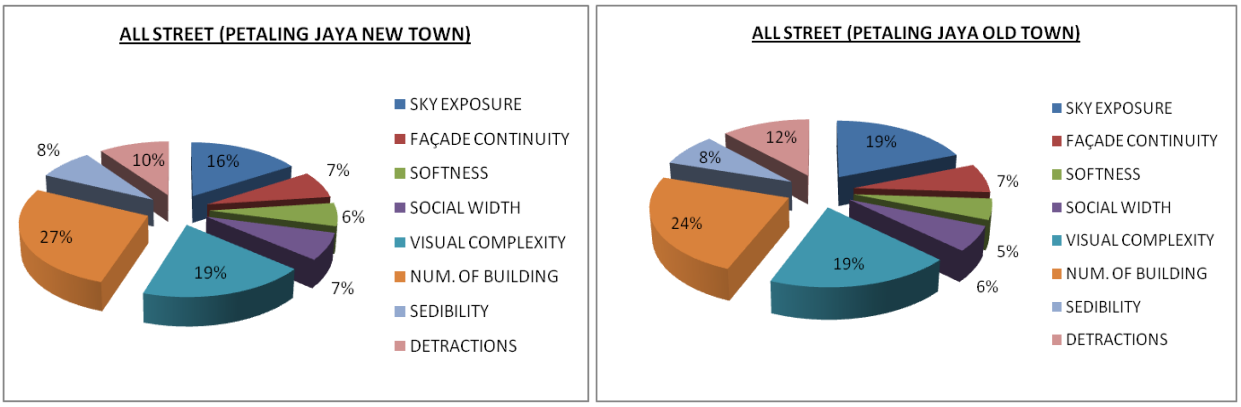

Figure 5. Application of Street Indicators for All Streets in Petaling Jaya New and Old Town

Findings

From the analysis that had been done, found that the streets indicator can be used in determine the sustainability in the city. In this study, there were 3 categories of road/ street that been analysis and from it, can be concluded for main streets, the design and application for Petaling Jaya Old Town is more sustainable from Petaling Jaya New Town. It is because, it depend on the history of the streets and also because of the suitable designing for the main streets in connecting Petaling Jaya Old Town from other streets.

But in general streets and all streets categories, the points that had been recorded shows that the applying of sustainable concept is more to Petaling Jaya New Town than Petaling Jaya Old Town. It happen because of the resolving of the problem that happen to Petaling Jaya Old Town. It shows that in Petaling Jaya New Town is more linked to other streets by improving the streets that are stated in the center. The government agencies in big quantities in Petaling Jaya New Town helped the designing of sustainable in this town. For overall finding shows that Petaling Jaya New Town is more sustainable than Petaling Jaya Old Town in street indicators.

Recommendations

From the analysis, it shows that there are only a part of the SDI indicators that had not been well applied yet especially for building continuity, softness, social width and sedibility. According to the pie chart analysis, it showed that the percentage of indicators that have been used in the development of streets are in small units and only 4 of the same indicators such as sky exposure, number of building, visual complexity and detractions that have been highlighted for both cities. General recommendations are propose that include several elements such as street furniture and parking. They are comprehensive proposals focusing on sustainable development considerations into the design of strategies "moving toward a local sustainability" and be able to represent the identity of a city.

i) Improving The Street Furniture

Street furniture facilities in the city is still not enough, especially the public benches, sign boards and information kiosks. Public seating facilities should be added and can be as a recover place for the users after a walk in the urban areas. The areas that are suitable for providing this facility is in the streets or in the walkway.

ii) Parking

Proposal for a comprehensive parking is aimed in solving the problem that is the lack of space for parking. Parking spaces of areas have to be covered with roof tops considering the weather in this country. The location of the parking has to be strategically located and situated so that the owners or tenants of adjacend premises can have clear view of parking cars. Besides, the providing of disabled (OKU) facilities at the parking lots to facilitate the movement of vehicles such as a special parking places.

Conclusion

The study is investigate 'street life' in cities as a crucial factor towards community success. The components of the neighborhood and street form that contributes to the richness of street life rely on the literature. The aim of the using Sustainable Development Indicators (SDI) is to measure the formal components of a neighborhood and street that theorists have stated important in promoting sustainability and how this concept helps to bridge urban design and sustainability. The tool of SDI for "Street Indicator" shows how this tools was applied in a comparative assessment of Petaling Jaya New Town and Petaling Jaya Old Town, two urban centers in Petaling District.

The improvement and renovation is not just for beautifying the cities, but the main concern is the aspects for future generations and social interest. In addition to highlight the cities image and develop the economy of an area, sustainable cities could also serve as a tourist attraction factors.

Therefore, Local Authorities should play an important role in ensuring the sustainability of a cities that can be formed with the availability of guidelines or policies that are appropriate for planning permission that involved the design and the image of the cities. In addition, the cooperation of local communities is also needed to enhance the integrity of the individual and be able to create cities that are safe and able to give comfort to all parties.

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