

THE EFFECTIVENESS OF LANDSCAPE ELEMENTS IN CREATING ROADSIDE URBAN LANDMARKS: INSIGHTS FROM THE GALLE ROAD FROM COLOMBO TO PANADURA

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Abstract

Landmarks are any natural or man-made structures that are recognized by the public of a particular place that makes the place memorable for them. These are important in many ways especially in an urban context; hence landmarks should be given high priority in the planning of a city. Human memory keeps adapting to new places and regularly generates mental images to make decisions on spatial aspects. Landmarks contribute to creating such a mental representation of a particular place.

Urban environment consists of both hard & soft landscape elements. It is important to realize how some of these landscape elements become landmarks. In this study, four fundamental rules (Similarity, Proximity, Simplicity, Continuity) of Gestalt theory of visual perception have been used to clarify the easiness of recognizing landscape elements; an object or feature as a landmark in commuter's mind.

A combined methodology of locational / photographic analysis and a route-based traveler analysis was used to assess how people recognize the locations with reference to the landmarks by considering hard and soft landscape elements.

The results revealed the distinct visual characteristics of hard landscape elements and the distinct spatial character generated by soft landscape elements are important in creating memorable landmarks. Therefore, the sensitive use of landscape elements according to the above two factors can go a long way in creating a striking landmark. Spatial aspects of soft landscape landmarks can lead to more pleasant urban spaces. This study will help future approaches in planning and designing urban landmarks and streetscapes effectively.

Keywords: landmarks, landscape elements, memorability, recognizability, legibility

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Introduction

Towns and cities need to be designed thoughtfully to build up a harmonious relationship between people and the built environment. Landmarks play an important role in creating this harmony by letting their citizens identify, remember, and appreciate locations, areas and even events. Landmarks also help travelers to “read” places along urban routes and form a city image that is unique to each city. However haphazard developments in the roadscapes of a city may disturb this legibility and the image of that particular city.

Accordingly, the ability to create an organized mental image by perceiving the environment is important, which is also known as environmental cognition. Lynch (1960) set the foundation for the idea of environmental cognition in the landscape with the collaboration of city elements such as nodes, paths, edges, districts, and landmarks. Spatial knowledge is needed to build a complete mental representation of an environment and visual landmarks are the most remembered and descriptive features of it. (Kalin and Yilmaz, 2012) Thus the absence of proper roadside landmarks reduces the quality of an urban area.

The urban environment consists of both soft and hard landscape elements. Hence, considering the landscape elements as a component of landmarks, only some of the elements we see in urban routes become landmarks while some are not.

Main objective of this research is to explore the role of landscape elements in forming landmarks with spatial memory. This study can be used as a design tool to develop streetscapes and other urban pockets (Roundabouts, pocket parks, etc.) by using landscape elements effectively as landmarks.

Literature Review

Landmarks

Landmarks are generally referred to as anything that is easily recognizable. But the term “landmark” has been defined in several other ways, more descriptively in scholarly articles.

Landmarks are not only what is easy to see and recognize but also to be able to be in the memory. (Richter and Winter, 2014)

Sorrows and Hirtle (1999), set out a characteristic definition for the landmarks as, an object or feature with prominent visual characteristics or which is unusual in the environment, or which is functionally important.

Lynch (1960) described landmarks as a type of point reference, where the observer does not enter.

Again in 2016, Bala and Alkan defined it as external cues, which play an important role to maintain orientation.

In most of the scholarly writings, landmarks have been defined by emphasizing their characteristics and importance. Below facts can be identified as common and similar in most of them.

- Highly recognizable and memorable with the prominence of visual characteristics.

- Perform as external indications where people don't enter, also contribute to navigating in an environment.

Therefore, the landmarks can be further defined as,

“The objects and features that are recognizable and memorable with prominent visual characteristics and act as external cues to navigate in an environment.”

Importance of Landmarks

The function of landmarks can be recognized on different scales. Sorrows and Hirtle (1999) described the role of landmarks in two approaches. In the first one, landmarks are described as a navigational aid, which is a common approach for landmarks. Since the effective and proper placement of a landmark can be used for wayfinding. In parallel with that, signaling sites, help for the location of other landmarks and confirmation of the route followed were explained by Denis (1999) as the key functions of landmarks (as cited in Bala and Alkan, 2016).

In the second one, landmarks are described as an organizing concept for space. Because, landmarks, which are known as symbolic landmarks, can represent a cluster of objects, different scales. (Sorrows and Hirtle, 1999) It can be further explained by using a few local examples as below.

- a) Sigiriya as a landmark represents the entire country of Sri Lanka. (Figure 1)
- b) Galle Face Green as a landmark represents the entire Colombo region. (Figure 2)
- c) Diyawanna Lake as a landmark represents the entire town of Sri Jayawardhanapura Kotte. (Figure 3)
- d) The unique character of street planting as a landmark represents the entire road, Bauddhaloka Mawatha. (Figure 4)



Figure 40: Sigiriya



Figure 41: Galle face



Figure 42: Sri Jayawardhanapura Kotte



Figure 4: Bauddhaloka Mawatha

Source: Google

When considering at a large scale, landmarks as one of the city elements, establish mental representations of environments in cognizing agents. (Richter & Winter, 2014)

Types of Landmarks

There are several classifications of landmarks. Based on the role in affecting an observer's navigation, Sorrows and Hirtle (1999) presented a common classification for the landmarks with 3 categories.

- Visual landmarks: Because of their visual characteristics.
- Cognitive landmarks: Because of its typical meaning/ for being atypical, in the environment.
- Structural landmarks: Because of their role or location in the structure of the space.

According to the context, landmarks can be divided into Urban landmarks, Suburban landmarks, and Country landmarks.

According to Allu (2013), Landmarks can be classified based on the composition, into:

- Geological and Meteorological Landmarks
- Biological Landmarks
- Man-made structural Landmarks

Most of the time in an urban setting, Biological & Man-made landmarks are more prominent than Geological & Meteorological landmarks.

Qualities and Characteristics of Landmarks

For being easily recognizable and memorable, landmarks need to have some significant qualities and characteristics. This has been properly explained by Lynch (1960) including three characteristics. Singularity makes landmarks visible and easily recognizable, due to their differences in size, shape, form, etc. The prominence of the spatial location refers to the visibility from many locations or the significance of the location. Distant landmarks are used by the general population and are rarely used in navigation (Lynch, 1960).

Lamit (2004) has described several qualities of Landmarks, that are inherent to Open space landmarks and special urban feature landmarks according to his categorization. Distinct cultural and social focus is the first one for the open space landmarks such as Cemeteries, Parks, some religious institutes, etc.

In special urban feature landmarks' visual qualities such as form, line, colour, size, etc. are important. Also, those types of landmarks should be able to promote interaction between people and the city and allow people to visit and encourage utilizing it. This is commonly done by using attractive urban furniture, sculptures, fountains, etc.

Landscape Elements

Landscapes consist of a wide range of elements. These elements caused both visual and physical qualities of a space and contribute to regulating functions. For example, Landscape elements such as benches, street lighting, fountains, support social interaction, especially in an urban landscape (Hussain and Ujang, 2014). Landscape elements can be classified into two groups as suggested by the London Borough of Croydon (2009) (as cited in Hussain and Ujang 2014)

- Hard landscape elements
- Soft landscape elements

According to Wahab(2018), Soft landscape elements are the organic components of a landscape, which are usually changeable and depend on climatic factors. Hard landscape elements are the non-organic components of a landscape, which are usually unchangeable in a short time period. Soft landscape elements represent nature such as trees, shrubs, turf, mulch soil, and water. Hard landscape elements represent man-made features such as retaining walls, paving, steps, building structures, etc.

Roads can be identified as public spaces and the hard or soft landscape elements that are placed or fixed in the roads for public use, are the roadside landscape elements which are also known as street furniture. This covers a wide range of items including street planting, benches, flowerbeds, signage systems, light posts, bollards, Clock towers, fountains, sculptures, paving, etc.

As individuals or as a combination, street furniture acts as landmarks and the Landmarks consist of different landscape elements. When considering the types of landmarks, biological landmarks consist of soft landscape elements such as urban green spaces, significant trees, landscaped roundabouts, etc. Man-made structural landmarks consist of hard landscape elements such as significant buildings, Flyovers, sculptures, clock towers, billboards, statues, etc. Thus, hard, and soft landscape elements are the components of all roadside landmarks.

Effectiveness of Landmarks

According to the range of definitions for landmarks, the effectiveness of a landmark can be measured in terms of 'recognizability' and 'memorability'. When considering landscape elements as components of landmarks, these two are the main aspects to assess all landscape elements including plantings and built structures as landmarks. Recognizability can represent the efficiency of visual perception. Memorability refers to the frequency of people who remember it and the clarity of its details. In simple terms, the effectiveness of landmarks consists of,

- how simple/ effortless is to perceive the landmark visually?
- how many people can remember it?
- up to what extent can they remember the details of it?

Recognizability: Perception of Landmarks

A mental Representation is the abstract symbolism of a particular thing that is not in the present. Previous experiences which were perceived by sensory organs have led to the mental representation in the first instance. Perception of an object or a feature as a landmark is not a conscious process. It is an involuntary act. This means landmarks must have properties that correspond to the grabbiness of the human senses. (Richter and Winter, 2014)

According to Richter and Winter, (2014) Grabbiness is related to the ability to grab the attention to become landmarks.

According to the Gestalt theory of visual perception, several fundamental rules have been identified as configurational qualities. From that, the following can be applied in perceiving landmarks. (Richter and Winter, 2014)

- **Proximity:**
It is about the state of being near in space. When Objects or features are placed near each other, they are easier to perceive.
ex: The statue next to the bridge has the potential of being easily recognized due to the proximity of the bridge.
- **Similarity:**
It is about the state of being similar to another known object or feature. When an object or feature is similar to another, is more likely perceived.
ex: A tower alike a Lotus bud, has the potential of being easily recognized due to the known shape/ form of a Lotus bud.
- **Simplicity:**
It is about the state of being easy to define. When an object or feature has simpler explanations for a configuration is more likely perceived.
ex: A cemetery, has the potential of being easily recognized due to its direct/ common meaning.
- **Continuity:**
It is about the state of being uninterrupted and repeated. When objects or features are placed in a linear order, it is more likely perceived.
ex: A Tree line, has the potential of being easily recognized due to its continuous character rather than a single tree.

Memorability

Memorability is the quality or state of being easy to remember. Even though people can perceive thousands of details in the environment, a few would get stuck in the mind. Others are disappearing from the mental image. According to Appleyard (1969), spatial characteristics such as size, Shape/complexity, Colour/texture, Visibility affect the memorability of landmarks. (Ahmadpoor and Heath, 2018) The term "famous" implicates the high frequency of people who remember it, which means the 'memorability' factor of the landmark. This memorability of landmarks can be measured in terms of,

- I. The frequency of people who remember it
- II. The clarity of its details.

Concept of Imageability

Lynch (1960) explains the concept of imageability and described, going through a city from viewers' minds as "image of the city". And some features including landmarks, have been identified by him as elements of the city that affect the mental representation. Three landmark characteristics were described by Lynch (1960) as, Singularity, The prominence of spatial location, and Distant landmark.

Gestalt Theory of Visual Perception

Gestalt theory of visual perception was introduced by Max Wertheimer, Kurt Koffka, and Wolfgang Kohler. The theory is about how people typically recognize things in perceiving the environment around them. According to the theory, the mind doesn't perceive all the things we see from the eyes at once. To understand how people gain meaningful perceptions from the stimuli around them, they have presented 06 fundamental rules. Proximity, Similarity, Simplicity, Continuity, Closure, Symmetry

Theoretical Framework

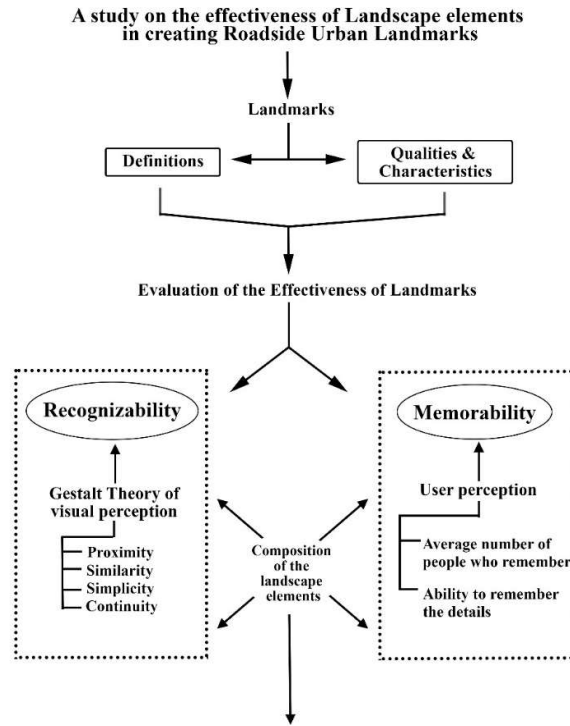


Figure 5: Theoretical framework of the study
 Source: Compiled by Author

A Literature survey was conducted by studying theories and concepts related to Urban Landmarks & Landscape elements and formulated criteria to evaluate the effectiveness of landmarks was derived from the literature survey.

In the case study a questionnaire was conducted, to understand how people recognize the locations with reference to the landmarks by considering hard and soft landscape elements. Finally, the collected data was analyzed by cross-checking the variables and justifying reasons for the obtained results and conclusion.

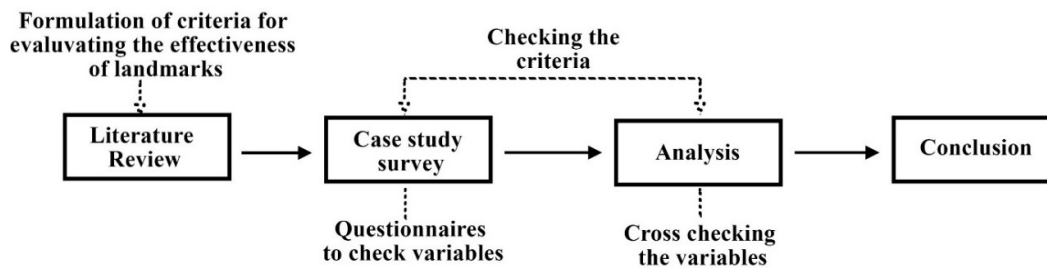


Figure 6: Method of study
 Source: Compiled by Author

Data Collection Methods

The two main data collection methods are a Questionnaire which was conducted as an online survey and the photographs of the landmarks in the selected route. A pilot visit was done to observe the whole route and to prepare a list of all possible landmarks with photographs. A questionnaire was conducted after the pilot visit. A group of people with diversity (age, time, periodicity. etc.) who travels along the route was selected for that.

The method of the questionnaire has a mixed-method approach. Both Open-ended and closed-ended questions have been used in the questionnaire. Closed-ended questions have been used to take quantified data and open-ended questions have been used to allow responders to give free-form answers particularly to identify the memorability of landmarks and to grab prominent characteristics of each landmark from responders' answers.

The structure of the questionnaire consists of four parts.

1. Questions of section 01 are, for the understanding of the responder's profile.
2. The second section is to verify the landmarks in the selected route in the mental mapping according to their perception.
3. The third part is to check the ability to recognize the locations of given landmarks.
4. The fourth part is to inspect the details of landmarks concerning landscape elements. Photographs were taken to identify the composition of landscape elements in each landmark.

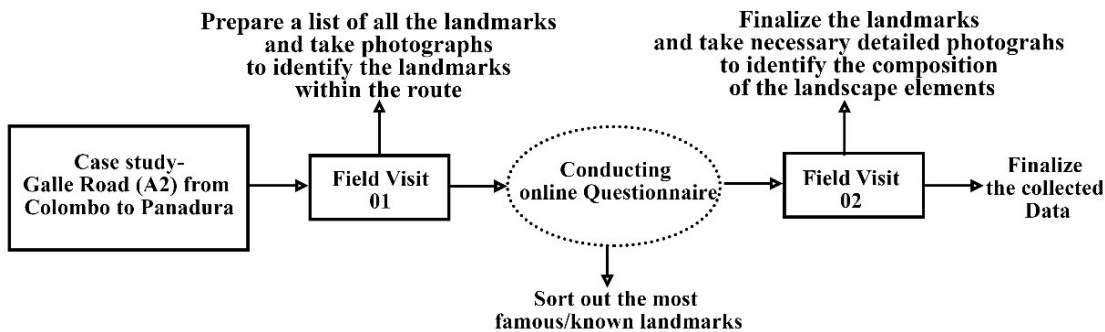


Figure 7: Field study Programme

Source: Compiled by Author

Case Study and Analysis

Colombo- Galle main road (A2) is one of the main arterial roads, which runs through urban towns and cities in Sri Lanka. Therefore, this route is being used by a large number of people who travel Colombo for different purposes. Galle Road (A2) from Colombo to Panadura selected as the case study, passes through Kollupitiya, Bambalapitiya, Wellawatta, Dehiwala, Mount Lavinia, Ratmalana and Moratuwa to depict the character of roadside landmarks on continuously built-up road edge typical of arterial roads that span through Colombo urban-sub urban areas.

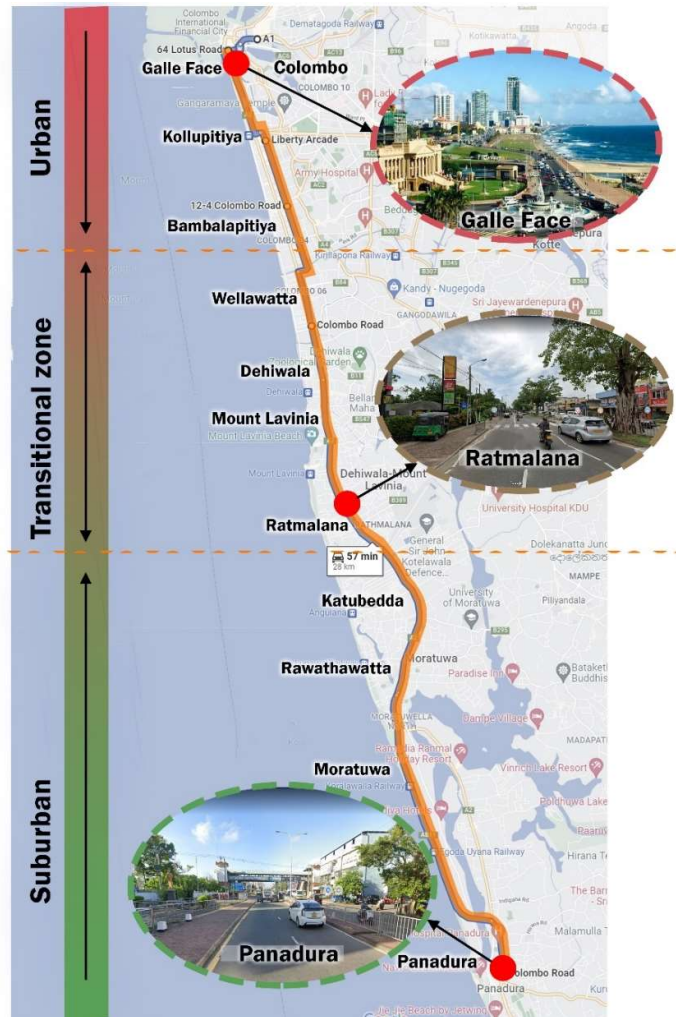


Figure 8: Map of Galle Road from Colombo to Panadura
Source: Google maps and edited by Author

The character of the roadscape gradually changes from urban to suburban. A transitional zone can be identified in the middle, most likely from Wellawatta to Mount Lavinia. (Figure 8) Beach is directly visible to Galle Road only at Moratuwa and Galle Face.

The following were listed during the pilot visit, as all possible landmarks in the selected case study route from Colombo to Panadura.

Building Landmarks:

- Moratuwa Railway station
- St. Sebastian's church
- Prince of Wales's college
- Queens of angles church
- Kzone shopping mall
- Soysaramaya temple
- Ratmalana Airport
- Maliban House
- St. Thomas college
- Mount Lavinia court complex
- Municipal council Dehiwala
- Savoy Wellawatta
- St Peters college
- Majestic city
- Unity Plaza
- Marina mall
- Temple trees
- Crescat shopping mall
- Galle face hotel

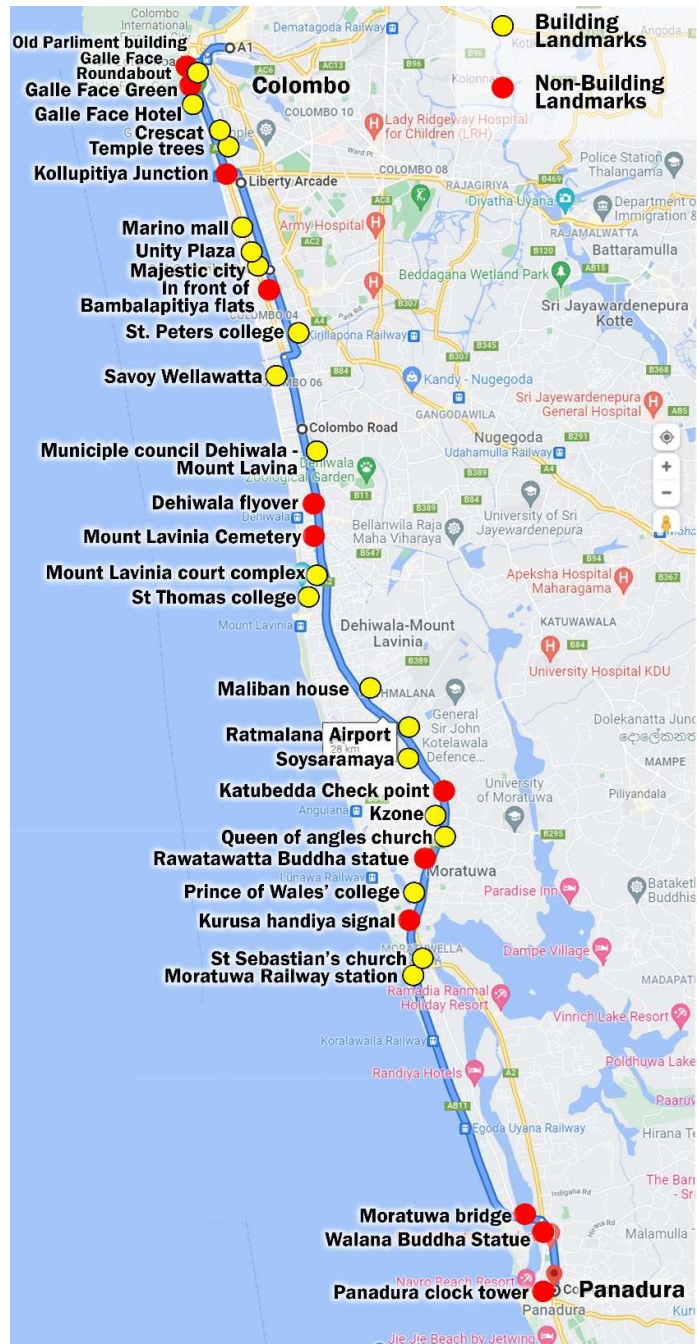


Figure 9: Map of Non-Building and Building Landmarks
 Source: Google maps and edited by Author

Non-Building Landmarks:

- Panadura Clock tower
- Walana Buddha statue
- Moratuwa bridge
- 'Kurusu-handiya' signal
- Rawatawatta Buddha statue
- Katubedda Checkpoint
- Mount Lavinia cemetery
- Dehiwala flyover
- In front of Bambalaptiya flats
- Kollupitiya junction
- Galle Face Green
- Galle Face roundabout

The number of non-building landmarks is less than the building landmarks in the selected route. Most commonly shopping malls, hotels, religious institutes, schools, and other important buildings have been identified as the building landmarks. Open spaces, green urban pockets beside the road, and landscaped arrangements in the middle of the road are the common non-building landmarks. When studying roadside landmarks from suburban to urban, it depicts that the number of non-building landmarks decreases, compared to the building landmarks. Specifically, from Mount Lavinia to Kollupitiya, the character of each town is almost the same. Very few landmarks can be identified except buildings.

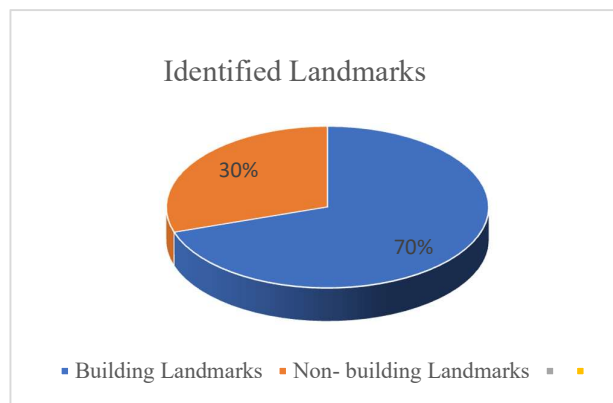


Figure 9: Identified Landmarks
Source: Compiled by Author

According to the received responses for the questionnaire, with the term "landmark", what people identified mostly were buildings. Identified building landmarks vs identified non-building landmarks ratio is 16:37 which implicates a poor landscape full of buildings and leads to decrease the legibility in urban towns.

Roadside non-building landmarks verified by the people are graphically represented as below. (Figure 10)

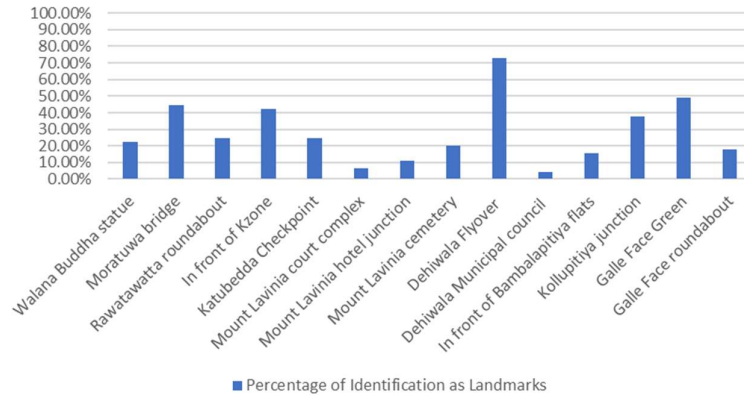


Figure 10: Percentage of identified objects and features
 Source: Compiled by Author

Based on the above graph, Dehiwala flyover, Galle Face Green, Kollupitiya junction, Moratuwa bridge, and the area in front of Kzone Katubedda are the highly identified features as “Landmarks” in Galle Road by people.

This study will be continued with the following verified 13 landmarks:

1. Walana Buddha statue
2. Moratuwa Bridge
3. Rawathawatta roundabout
4. In front of Kzone
5. Katubedda checkpoint
6. Mount Lavinia court complex
7. Mount Lavinia cemetery
8. Dehiwala flyover
9. Municipal council Dehiwala
10. In front of Bambalapitiya flats
11. Kollupitiya junction
12. Galle Face Green
13. Galle face roundabout

Memorability of Landmarks

As explained in the literature survey, the Memorability of landmarks can be evaluated in terms of the frequency of people who remember and the clarity of its details. To quantify the memorability of landmarks, in the questionnaire random photographs in the case study route were given to recognize the location. And the percentage of ability to recognize the location is graphically presented as below.

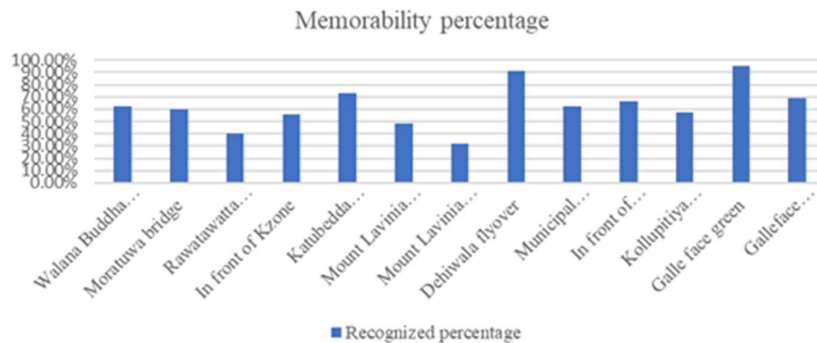


Figure 11: Memorability of Landmarks
 Source: Compiled by Author

When comparing the variation of the two graphs (Figure 10 & 11), both are nearly the same. Galle Face Green, Dehiwala flyover have the highest ability to be recognized. But even though Rawathawatta roundabout, Mount Lavinia courts complex, Municipal council Dehiwala, in front of Bambalapitiya flats have considerable visual characteristics of being recognized, most of the people don't memorize them with the term "landmark".

Since most of these locations don't have particular names, when answering the questionnaire, each landmark was introduced in responder's own way by emphasizing different features or nearby locations. From that, the striking characteristic of that particular landmark is revealed. For example, Walana Buddha statue as,

- "Samadhi" Buddha statue Panadura, (Form)
- Golden Buddha statue, (colour)
- Buddha statue in front of Panadura Roundabout. (Locational importance)

Analytical identification of Landscape elements of Landmarks

Identification of landscape elements in creating roadside urban landmarks is important for the further analysis of the data. When analyzing the details of the above-verified landmarks, all of them are single landscape element or distinct arrangements of various landscape elements. Details of landmarks were evaluated in the third section of the questionnaire.

01) Walana Buddha Statue



Figure 12: Walana Buddha statue
Source: Google

Identified percentage of this landmark- 60% The most striking Landscape element here is the Buddha statue. Coinciding with the religious importance spatial characteristics such as size and color have contributed to the high memorability as a landmark.

This location has been identified as "Golden statue alike Samadhi statue in Anuradhapura" or as "Samadhi Buddha statue Panadura". The visual similarities of two statues are more likely perceived as a landmark. According to the Gestalt

theory of visual perception, "Similarity" has been identified as one of the fundamental rules.

02) Moratuwa Bridge

Identified percentage of this landmark- 42.2%.

In general, all the landscape elements here are ordinary which can be seen in most of the bridges in Sri Lanka. But the simpler explanations for a configuration as a bridge might be contributed to the memorability up to a certain extent. According to the Gestalt theory of visual perception, "Simplicity" has been identified as one of the fundamental rules.



Figure 13: Moratuwa Bridge
Source: Compiled by Author

03) Rawathawatta Roundabout

Identified percentage of this landmark- 46.6%

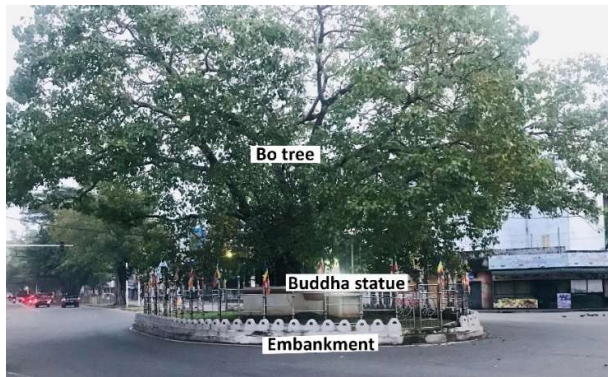


Figure 14: Rawathawatta Roundabout
Source: Compiled by Author

There are two main landscape elements in here as Bo-tree(Bodhi) and the Buddha statue. One specialty of this location is when answering the questionnaire, responders used several terms to name the location. Ex: Rawathawatta junction, Rawathawatta Bo tree, Rawathawatta Roundabout, Rawathawatta Buddha statue.

Since most of the responders have identified this landmark as Rawathawatta Bodhiya, the Bo tree as a landscape element might be more

prominent here than the statue as a landscape element. The proportion and the size of these two elements may contribute to such a difference. (Figure 15) Because the Buddha statue is considerably smaller in size, compared to the Bo tree here. On the other hand, placing these two landscape elements near to each other has more likely perceived and memorized rather than an isolated Bo tree or buddha statue. According to the Gestalt theory of visual perception, "Proximity" has been identified as one of the fundamental rules. But the size and the proportion of landscape elements can make significant changes in recognizability, especially when placed near to each other (Figure 15).

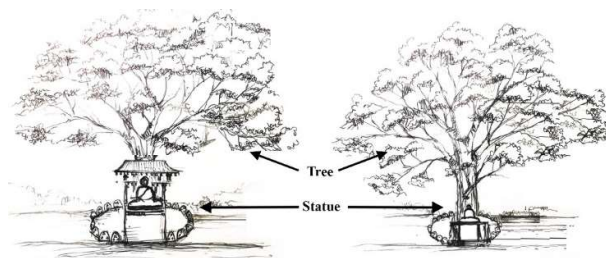


Figure 15: Size and the proportion of Landscape Elements
Source: Compiled by Author

04) In front of Kzone

Identified percentage of this landmark- 33.3%



Figure 16: In front of Kzone
Source: Compiled by Author

There are only a few striking Landscape elements in here. A graffiti wall and some tree clusters beside the road come across as ordinary according to the questionnaire results. Although only 42.2% of responders have mentioned this location as a landmark, 55.5% of responders have recognized the location from its landscape elements. Locational importance as Katubedda junction, might be prominent here since people memorized it as a landmark but only a few of them recognized the location from its landscape elements.

05) Katubedda Check point

Identified percentage of this landmark- 48.8%



Figure 17: Katubedda Check Point
Source: Compiled by Author

The most striking Landscape element in here is the steel-built structure across the road. The proportion and the massive size of the structure might have affected the memorability of this feature as a landmark.

06) Mount Lavinia Court complex

Identified percentage of this landmark- 44.4%.

The most striking Landscape element in here is the tree cluster along the wall. Even though the trees are not so close to the road, it creates a unique character for the particular location. The size of the trees and bent branches towards the road creates a distinct shady character to the road. Since landmarks aren't always about objects but also the features which have prominent visual characteristics, this location can be considered as a landmark (Figure 19). Also, tree lines as configurations in a linear order are more likely perceived rather than a single tree. According to the Gestalt theory of visual perception, "Continuity" has been identified as one of the fundamental rules.



Figure 18: Mount Lavinia Court Complex
Source: Compiled by Author

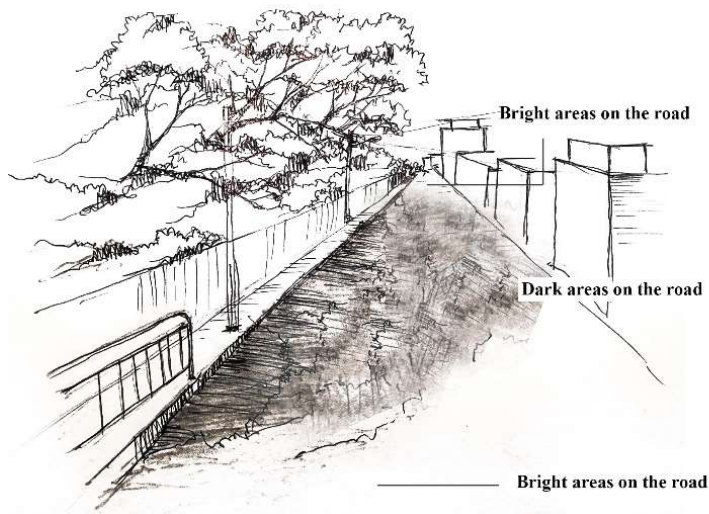


Figure 19: Spatial character created by soft Landscape elements.
Source: Author

07) Mount Lavinia Cemetery

Identified percentage of this landmark 71.1%



Figure 20: Mount Lavinia Cemetery
Source: Compiled by Author

The main striking Landscape elements in here are tombstones and short stone walls with flower beds. Out of these two, tombstones as a landscape element have better performance since most of the people have recognized the location easily from that.

Also, simpler explanations for a configuration are more likely perceived such as tombstones for a cemetery. According to the Gestalt theory of visual perception, "Simplicity" has been identified as one of the fundamental rules. With all these factors, landscape elements of Mount Lavinia cemetery have a good arrangement as a Roadside urban landmark in Galle Road.

08) Dehiwala Flyover

Identified percentage of this landmark- 77.7%



Figure 21: Dehiwala Flyover
Source: Compiled by Author

The most striking Landscape element in here is the massive flyover bridge. Coinciding with the locational importance (Dehiwala junction), spatial characteristics such as size and proportion have contributed to the high memorability of Dehiwala flyover as a landmark.

Furthermore, being the only flyover in the entire Galle Road, Dehiwala flyover implicates a dominating characteristic of a landmark as "singularity". With all

these factors, Dehiwala flyover can be considered as one of the famous Roadside urban landmarks in Galle Road.

09) Municipal council Dehiwala

Identified percentage of this landmark- 55.5%



Figure 22: Municipal council Dehiwala
Source: Compiled by Author

The main Landscape elements in here are the trees, a statue, Water fountain with sculptures and some seating. Out of those, most of the responders have recognized the location from the water fountain with lion sculptures. Hence that has been prominent in here than the other landscape elements. But some people have been misled by those lion sculptures since there're a few other locations which have similar sculptures such as in Kollupitiya junction, Galleface

roundabout. Only a person who has attention to the details of a landmark can differentiate the locations by dissimilar postures of lion sculptures.

Also, this space allows people to come and encourage utilization. For that, it has been facilitated with attractive water fountains and some seating facilities under shady trees. Since promoting

interaction between people is a quality of special urban feature landmarks, that might have contributed to the considerable memorability of Municipal council Dehiwala as a landmark.

Compared to the other landscape elements in here, statue of Major L. V. Gunarathne has been diminished in the memorability of landmarks. Most of the responders have not recognized the location from that. Accordingly, the size, proportion and placement can be considered as more important factors than the color of a roadside statue to grab the attention of commuters.

10) In front of Bambalapitiya Flats

Identified percentage of this landmark- 53.3%



Figure 23: In front of Bambalapitiya Flats
Source: Compiled by Author

The most striking Landscape element in here is the three large Albizia saman trees. Those trees have been planted along the road with a similar distance between each. And a bus stop shelter, a wide pavement, and a short embankment can be identified as landscape elements. Since there are not any hard landscape elements with distinct visual characteristics, people might not memorize this location with the term "landmark". But according to the questionnaire, a considerable number of responders have recognized

the location from its landscape elements. These massive well-branched trees provide shade to the entire area, and most of the people have recognized the location from that unique character including trees.

Also, the configurations that in a linear order are more likely perceived such as this tree line. According to the Gestalt theory of visual perception, "continuity" has been identified as one of the fundamental rules. Apart from that, all the hard landscape elements in here are very ordinary and not noticeable. And the locational importance is prominent here in two ways as it's in front of Bambalapitiya flats and is one of the main bus stops for the passengers. Therefore, people have used to utilize the location which is a quality of special urban feature landmarks.

11) Kollupitiya Junction

Identified percentage of this landmark- 40%

The main Landscape elements in here are the water fountain, lion statues, grass lawns and some ornamental plants. The roundabout for the vehicles in the middle of the three-way junction has been created from the association of these landscape elements. Most of the responders have identified this location as a landmark and have recognized the location from the photographs. But many people were unable to recognize the location from its individual landscape elements. Some of them have been misled by other locations which have lion statues such as independence square and Galle face roundabout.



Figure 24: Kollupitiya Junction
Source: Compiled by Author

And for daytime travelers, the water fountain is not noticeable since it isn't active most of the time. But occasionally in the nighttime, the feature gets enhanced by the landscape lights.

About the soft landscape elements, individually those ornamental plants don't exhibit distinct visual characteristics. But as a whole, it blends with the design without being foregrounded.

Since there's a lack of outstanding visual characteristics in the overall design including landscape elements, this location has unable to be easily recognized and perceived by people.

12) GalleFace Green

Identified percentage of this landmark- 77.7%

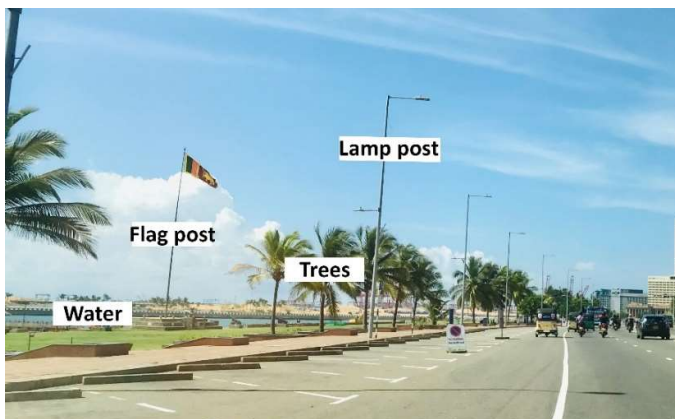


Figure 25: Galle face Green
Source: Compiled by Author

This is a well-known beach strip in Colombo that consists of numerous landscape elements. For a person who travels on the Galle Road, the main Landscape elements that can be seen here are the tree line, a wide pavement, a flag post, streetlamp posts and from the borrowed landscape a wide beach lawn and seawater. According to the received responses for the questionnaire, both locational importance and the spa tial arrangement might have

prominent in here for the high recognizability and memorability. For a person who travels from Panadura side to Colombo, this is the only location where the beach is visible to the Galle Road after Moratuwa. Therefore, the location has the ability to grab attention easily.

According to Lamit, H. (2004), this location can be identified as an open space landmark with natural boundaries. For the boundary, a coconut tree line along the beach strip has been planted to implicate the boundary and most of the responders have recognized the location from this landscape element. Moreover, tree lines as configurations in a linear order are more likely perceived and be recognized. According to the Gestalt theory of visual perception, "continuity" has been identified as one of the fundamental rules.

13) GalleFace Roundabout

Identified percentage of this landmark- 66.6%

The main striking Landscape elements in here are the water fountain and the encircling four lion statues. And the entire landmark consists of hard landscape elements. Although most of the responders have recognized the location accurately from these landscape elements few people have been misled by the lion statues. Therefore, in the memorability of commuters, the water



fountain has become prominent than statues. Especially all the people who travel in the nighttime, have recognized the location for the reason that it has enhanced by the landscape lights in the night. Apart from that, the prominence of the spatial location is elucidated here, which can be considered as one of the common characteristics of landmarks.

Figure 26: Galleface Roundabout
Source: Compiled by Author

The summary of the case study route can be demonstrated below.

Effectiveness of Soft Landscape elements of Landmarks:

Trees, shrubs, and groundcovers such as grass lawns, and water are the roadside soft landscape elements that can be seen in the case study route. According to the overall case study, the soft landscape elements that are below the eye level of commuters such as groundcover plants, and shrubs, don't contribute to create landmarks.

When considering the trees, the arrangement of planting has become more important than the visual characteristics such as color, shape in creating Landmarks. For example, tree lines as configurations in a linear order are more likely perceived and be recognized than a single tree or a tree cluster. But a single religious tree is more likely perceived and be recognized rather than being one of a tree cluster.

Ornamental plants such as flower beds have the least contribution in creating roadside landmarks due to their short lifespan. Water as a soft landscape element caused the high memorability of Landmarks when used in attractive fountains.

One of the main findings of this study is mostly the unique spatial character generated from a particular plant is highly effective than the visual characteristics of a plant in creating Landmarks. Because people as commuters easily recognize and memorize the spatial character such as the shadiness created from a large tree, than the size, shape, or color of a tree.

Effectiveness of Hard Landscape elements of Landmarks:

Only the man-made hard landscape elements are available in the case study route. Most of them are street furniture placed with the purpose of Aesthetics, safety, utilization, and communication.

According to the overall case study, the hard landscape elements that are below the eye level of commuters such as pavements, bollards, and short embankments don't contribute in creating landmarks.

Three types of statues as religious, human, and animal statues can be identified in the case study. Out of them, religious statues are the Buddha statues, Catholic holy statues, and other deities' statues. Most of the time all these religious statues behave as Landmarks at different levels. But the Memorability of the commuters is based on the visual characteristics of the statue. Statues with unique colors, massive scale are easily be memorized. Human statues that have been constructed on the road to celebrate a person are rarely be memorized as a landmark.

Most of the people have perceived them with a common identity as "statue" without its particular details. Lion statues can be seen in several locations in the case study to represent Sri Lankan culture. But some people have been misled by that since the details of animal statues aren't much noticeable.

The streetlights are very effective in creating landmarks. When considering the hard landscape elements that are been placed for the utilization of the general public, such as seats and bus halt shelters, those locations have been recognized by some of the responders. That hasn't been recognized from the visual characteristics of the particular element, but when functioning the element with people, it becomes highlighted and easily been recognized. For example, when a considerable number of people sit and stay at some ordinary benches, the location becomes easily recognizable rather than some empty benches.

One of the main findings of this study is mostly the distinct visual characteristics of hard landscape elements such as color, form, shape, and proportion are highly effective in creating Landmarks.

By considering the above factors, the sensitive use of both hard and soft landscape elements is highly influential to create a striking landmark.

Conclusion

This research has demonstrated the contribution of landscape elements in creating roadside urban landmarks. An effective roadside landmark has the potential to be easily recognized and memorized by commuters.

Even though general public expectations refer to the buildings and built structures with the term "Landmark", landmarks are not always buildings. It can be a unique and contrasting character too. Both building landmarks and non-building landmarks are important for the legibility of an urban area.

Colombo- Galle main road (A2) as one of the main arterial roads in Sri Lanka is being daily used by a large number of people to reach and depart Colombo. The responses of the questionnaire indicate that the number of non-building landmarks is decreasing when traveling from suburban

to urban. It implicates a poor landscape full of buildings, where monotony and legibility issues occur.

Non-building landmarks consist of landscape elements individually or as a combination. It is important to consider the spatial and visual characteristics of landscape elements with the above four factors in roadside urban designs. To analyze these four factors in a proper manner, 13 different case study locations were selected based on the memorability of respondents within the case study route Colombo to Panadura. The results of the case study locations revealed that the factors are affected in different ways depending on the locational importance, the unique characteristics of the particular landscape elements, and their arrangement.

Considering the overall findings of 13 locations, it becomes clear that the distinct visual characteristics of hard landscape elements and the distinct spatial character generated from soft landscape elements matter in creating memorable landmarks.

Landscape architects, Urban planners, and Designers as professionals, have a significant role in designing streetscapes and other urban pockets in an appropriate way, to be exposed as a landmark or to be camouflaged in the urban environment. Not all the elements and spaces beside a road should be designed to call the attention of the commuters. These professionals' decisions can have a significant impact on the legibility of cities and the experience of commuters along urban routes. The outcome of this research can be used as a guideline for the effective use of landscape elements in designing streetscapes and other urban pockets.

Considering the findings of this research, Landmarks can be designed as attractive and meaningful social interactive spaces than a typical built structure. The creation and maintenance of high-quality landmarks leads to a vital, stress-free city and eventually, the cultural development of society can be approached.

References

- Ahmad Zamil Zakaria, S. A. ,2016. The Importance of Soft and Hard Landscape Elements to the Malays Sub-Ethnic in Perak. *Annual Serial Landmark International Conferences on Quality of Life* (pp. 25 – 27). Medan: Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Seri Iskandar Campus.
- Ahmadpoor, N., and Heath, T. ,2018. Data and GPS systems; Comparing navigation and landmark knowledge between GPS Users and Non-GPS Users. *Data, Architecture and the Experience of Place*.
- Allu, A. ,2013, April. *How Landmarks define a city*. Retrieved from Re-thinkingthefuture.com.
- Bala, and Alkan, H. ,2016. *Landmarks in Urban Space as Signs*. Konya.
- C.Chamberlain, C. R. ,2019. The influence of landmarks and urban form on cognitive maps using virtual reality. *Landscape and Urban Planning*, 296-306.
- CapeMag. ,2010, 09 22. *Urban Landmarks*. Retrieved from urbandictionary.com.
- Gary W. Evans, P. P. ,1984. Cognitive Mapping and Elderly Adults: Verbal and Location Memory for Urban Landmarks. *Journal of Gerontology*, 452–457.
- Hussain, K. A., and Ujang, N. ,2014. Visitors' Identification of Landmarks in the Historic District of Banda Hilir, Melaka, Malaysia. *Procedia - Social and Behavioral Sciences*, (pp. 689-699). Melaka.
- Kalin, A., and Yilmaz, D. ,2012. A Study on Visibility Analysis of Urban Landmarks: The case of Hagia Sophia (Ayasofya) in Trabzon. *METU JFA*, 241-271.
- Lamit, H. ,2004. Redefining landmarks. *Alam Bina Journal, University Technology Malaysia*.
- Lynch, K. ,1960. *The image of the city*. London: The M.I.T. Press.
- Michon, P.-E. ,2001. When and Why Are Visual Landmarks Used in Giving Directions? *International conference on spatial Information theory*.

- Nor Haslina Ja'afar, A.Bashri Sulaiman, Shuhana Shamsuddin. ,2014. The Contribution of Landscape Features on Traditional . *ASEAN Conference on Environment-Behaviour Studies* (pp. 644-655). Bangkok: Elsevier Ltd.
- Richter, K.-F., & Winter, S. ,2014. *Landmarks*. New York: Springer.
- Robert Cohen, Therese Schuepfer. ,1980. The Representation of Landmarks and Route. *Child Development*, 1065-1071.
- Sorrows, M. E., and Hirtle, S. C. ,1999. The Nature of Landmarks for Real and Electronic Spaces. *International Conference on Spatial Information Theory*, (pp. 37-50). Stade.
- Wahab, M. H. ,2018, November 30. *Urban Landscape Elements*. Retrieved from Slideshare.net:
- Yuan Menga, H. X. ,2019. Exploring the relationship between landscape characteristics and urban vibrancy: A case study using morphology and review data. *Cities*.