



## Investigation of Mental Mapping in Urban Design: Case of Queensbay, Penang

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ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received 31 August 2017 Accepted 25 November 2017 Available online 01 December 2017</p> <p><i>Keywords:</i> Urban Design Element; Modern Urban Design; Sustainable Architecture.</p>	<p>Configuration of urban design in Queensbay, Penang has played an important rule to highlight image of this city. The main goal for this research is to investigate mental mapping based on the observer perception. This study approaches an inventory of the layout plan Queensbay for the case study. With scientific research from books and internet, the study will help to determine five important elements namely paths, edges, districts, nodes and landmarks. The analysis shows the city was derived from modern urban design. It was constructed with a gridiron system as a primary layout plan. Vehicular access road was smooth but lacks of arterial and collector roads. The north-south building arrangement was well oriented and being design to capture sea breeze and vista. Residential houses, commercial buildings and promenade have a direct access to the sea front. Even though this is one sample of a successful new urban planning in Penang, the development needs to have clear and dominant landmark.</p> <p>© 2017 INT TRANS J ENG MANAG SCI TECH.</p>

## 1. Introduction

According to urban legend, the town of Bayan Lepas was founded in the late 19<sup>th</sup> Century by a family from Sumatra whose aviary pet parakeet (Bayan). Unfortunately, the pet was escaped. To commemorate their beloved pet, that place was named Bayan Lepas or escape bird. Queensbay, formerly known as the Bayan Bay before being interrupted with Asian financial crisis, is located in the district of Bayan Lepas, near the southeastern tip of Penang Island. It takes about 11 km or 25 minutes' drive from George Town and about 10 km or 20 minutes' drive from Penang Airport. Queensbay is also linked to the mainland Peninsular Malaysia by Second Penang Bridge.

Queensbay is one of the earliest developments on reclaimed land. Even though the development now is growing quite slow compared to the other reclaimed land, Queensbay has its own attraction to adore visitors to come for shopping, gathering, banking and own the property. The

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location of the site is also quite interesting because it is in the middle of the island with a few listed hotels to serve local and international tourists.

The study objective is to investigate the mental mapping of the urban design elements i.e. nodes, districts, edges, path and landmarks in the case study. It also aims to determine if the layout plan design has applied latest urban design either a compact city or intelligent city concept also known as city of short distance or smart growth or new urbanism (Lynch, Garsia and Dhany,2015). This report will also study on elements that emphasis friendly environment for pedestrian and cycling, social interaction, mixed-used buildings, transit systems and complete street design.

## **2. Literature Reviews**

The literature study review on urban design elements from a study by Kevin Lynch which are as follows (Lynch,1960):

### **2.1 Paths**

Paths are one of the dominant elements in urban space. Typical spatial characters, unique façade decorations are both helpful to strengthen the image of particular path. In Lynch's view, these parts of the city are the routes along which the observer customarily, occasionally, or potentially moves. Along these path, people usually observe the city and the arrangement of the environmental elements. Paths is also the streets, sidewalks, trails and other channels in which people used to travel.

### **2.2 Edges**

Edges are boundaries which separate two districts with visually predominant and continuous form. While continuity and visibility are crucial, strong edges are not necessarily impenetrable. According to Lynch's, edge usually perceived boundaries such as walls, buildings, and shorelines. Edges can be barriers, seams, lines along which two regions are related and joined together. These edge elements sometimes are used in organizing features and generalized the areas. Edges also show the outline of a city either by water or a wall.

### **2.3 Districts**

Districts are relatively large city areas with common characters which observers can mentally go inside of. The physical characteristics that determine districts are thematic continuities which may consist of an endless variety of components: texture, space, form, detail, symbol and so on. Districts are relatively large sections of the city distinguished by some identity or character. Observers are mentally entered to the city and conceive the space as a two-dimensional extent. Concepts of size may depend in part on how well a structure can be grasped. It seems to depend not only upon the individual but also upon the given city.

### **2.4 Nodes**

Nodes are strategic foci which observers can enter, which are not only small points but also

squares, linear shapes and central districts etc. Basically, there are two types of nodes: junctions of path and concentrations of characteristics. A successful node should have unique features inside, and intensifies some surrounding characters as well. Nodes are the first attraction or focal points and intersections of the road. They may be simply concentrations, which gain their importance from being the condensation of some use or physical character, as a street-corner hangout or an enclosed square.

## 2.5 Landmarks

Landmarks are reference external objects conceived by the observers, which can be defined as simple physical elements. Singularity is the key physical characteristic of landmarks, creating spatial predominance through contrast with surrounding elements, making them unique or memorable in urban context. Landmarks normally are points of references, simple physical elements which may vary widely in scale, such as building, sign or mountain. Landmarks usually provide local contrast to the nearby elements. Typically, they become a symbol and may be seen from many angles and distance. Landmarks are frequently used as a clues or identity when the people want to familiar the area.

By using the five basic elements such as those listed above, the appearance of the city can be observed and recorded either visual (mental mapping) or manual sketched and documented. Indirect growth or movement in the city can also be observed for the purposed of recording the data.

## 3. Background of Case Study

Queensbay (Figure 1) is a new upmarket waterfront development. It is located in the south-eastern seaboard of the island. The development consists of shop offices, corporate towers, hotel, bungalows, semi-ds, seafront villas, condominium, service apartment, and Queensbay Mall, the largest and longest shopping mall in Penang. 80 % of the land area has been designated for commercial use while the remaining 20% is residential (Adam Tan,2007).



**Figure 1:** Queensbay Mall, Bayan Lepas, Penang

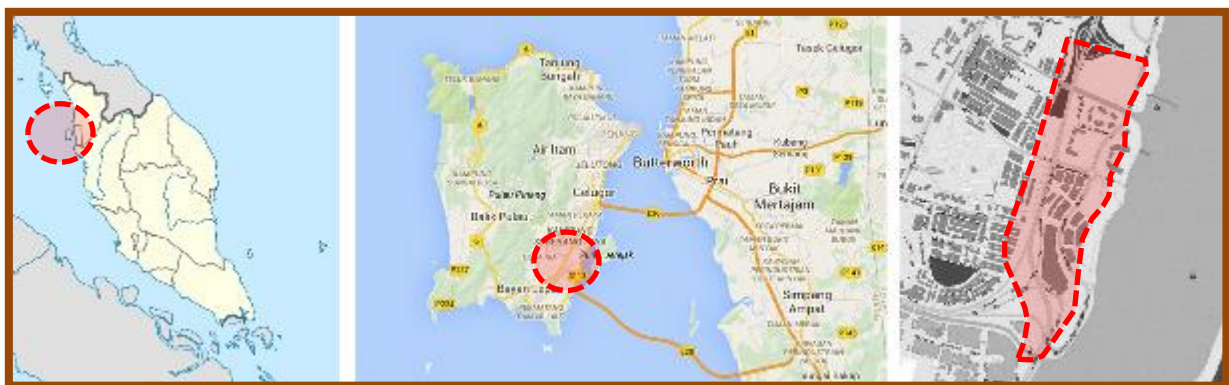
Queensbay Mall is the heart of Queensbay. It is the biggest retail property development on Penang Island, boasting a gross built-up of 2.6 million sq. ft. Queensbay Mall has been envisioned as a brand-new shopping, entertainment and lifestyle concept that will revolutionized the retail

scene in Penang. The construction of the mall, formerly known as the Bayan World Megamall, stopped in 1998 because of the Asian financial crisis. The project was abandoned for eight years, before fully completed by the end of 2006. The opening of the Mall is the beginning of the growth in this new city (Figure 2).



**Figure 2:** Queensbay districts from internal view shows a Queensbay Mall on the left, 3 storeys shop lot in the middle and high-rise apartment facing water front

Queensbay is midway between the Old Penang Bridge interchange and the Bayan Lepas Industrial Park. It is also situated in the declared area as the Penang Cybercity 1 (PCC1) which forms part of the Multimedia Super Corridor (MSC). Accessibility to Queensbay is supported with excellent infrastructure via the dual carriageways of Bayan-Lepas Jelutong expressway whilst benefiting from its close linkage to alternative routes such as Jalan Sultan Azlan Shah, Jalan Tun Dr Awang and Jalan Aziz Ibrahim. Queensbay 's location will further be enhanced with the new second link bridge and the development of Penang Outer Ring Road (PORR) carriageway connecting main land to Gurney Drive in the future (Figure 3).



**Figure 3:** Key Plan of Penang, Location Plan and Limit of study at Queensbay, located at Bayan Lepas Distric, Penang.

#### 4. Methodology

This study will be based on physical qualities which related to the attributes of identity and structure in the mental image as indicated in Figure 3. Three components such as identity, structure and meaning will be analyzed to determine the urban criteria. First, to speed up the process of collecting data and limit of the study, the data will be based on source from internet including the site plan. Second, an urban image will be determined based on five urban elements with reference



by the book, *The Image of The City* (Lynch,1960). Third, pre-assumption analysis will be conducted according to the pre-data collection. Forth, data collection will be analyzed through observation of the paths, edges, landmarks, districts and nodes. The study lastly will analyze the data and summarize base on the observation during the site visit.

## 5. Data Analysis

Purposed for this study is to analyzed and documented all the required elements base on mental mapping by the observer. According to Lynch, mental mapping as a research instrument uses the mental maps people’s perception gain insight in the collective and significance data for the urban territory for specific groups. This case study was focus only on five elements such as paths, nodes, districts, edges and landmarks in Queensbay District.

### 5.1 Paths

Queensbay district can be accessed by a few roads. The path of the site is design with grid iron origin concept. Lebuhraya Dr Lim Chong Eu become primary access road to the site and connected with Persiaran Bayan Indah (Figure 4).

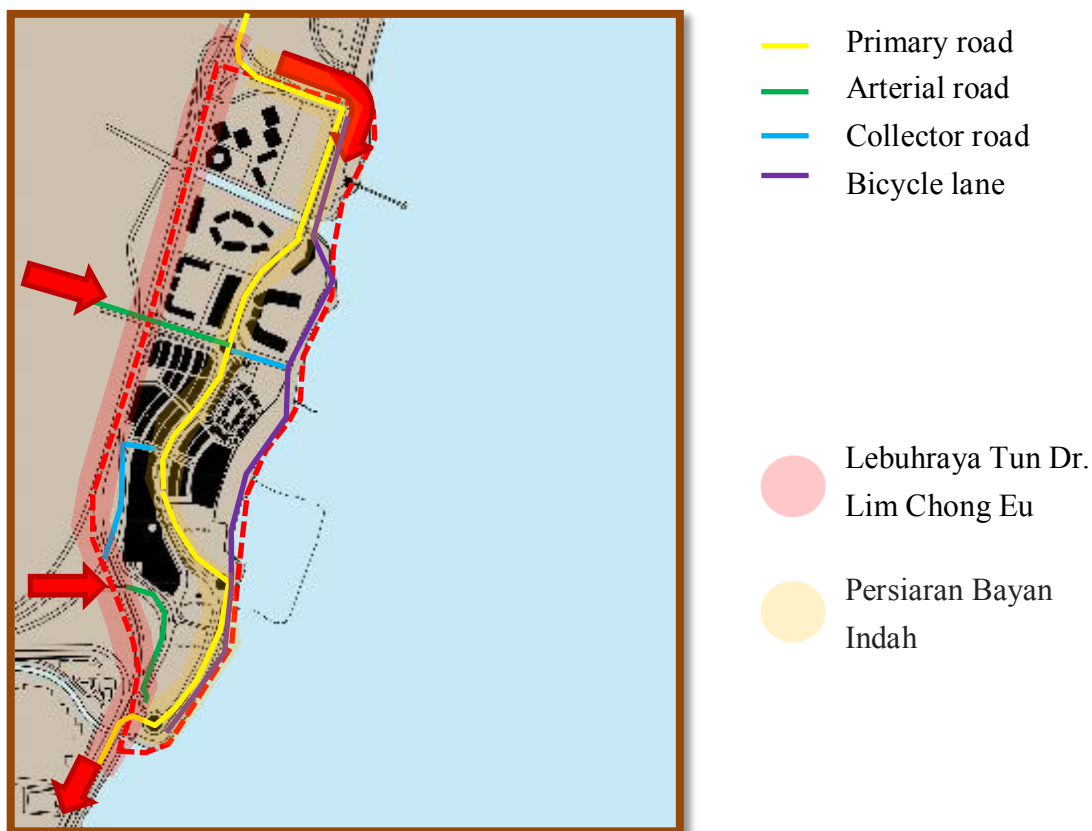


Figure 4: Internal paths at Queensbay district

#### 5.1.1 Vehicle Paths

Photo had taken from early morning to evening to show vehicle movement at main entrance to the site. During peak hour from 5 pm to 7 pm, all routes were congested by the user enter and exit from the site (Figure 5).



**Figure 5:** Vehicle path at entrance and internal road

### 5.1.2 Bicycle Paths

Queensbay is one of the development who promote the use of bicycles by providing bicycle parking and bike trail (Figure 6). Link Bike is the IoT (Internet of Things) project from MBPP which is designed to best serve the community and the environment. (C.Lilian, 2017). The aim for bike-sharing system is to tackle traffic congestion as well as pollution. According to Lilian, there will be a total of 25 stations strategically scattered throughout the George Town area and other places on Penang island including Queensbay. Bicycle lane is also used by resident to do physical exercise and jogging.



**Figure 6:** bicycle park located beside Queensbay Mall, bike sharing system in front of the mall and bicycle lane along the edge of the sea

### 5.1.3 Pedestrian Paths



**Figure 7:** Pedestrian paths in front of queensbay and zebra crossing

Pedestrian paths show in Figure 7 connected people from a few nodes such as Kapitan Restaurant, Bus station and also from open parking besides Queensbay Mall. Both are connected by an efficient zebra crossing.

## 5.2 Districts

Districts in Queensbay for commercial and residential show in Figure 8.



**Figure 8:** District for commercial and residential at Queensbay.

### 5.2.1 Residential Districts

Residential area consists of high rise building i.e. Tropicana Bay Residence, Putra Palace Condominium, Villa Emas Condominium and Bay Star Condominium. Bay Garden is a gated and guarded landed housing consist of semi detach housing and bungalows. In front of all entrance, Putra Palace is the most congested with bus and car stop for fetching and delivering passengers.

### 5.2.2 Commercial Districts

Commercial area including Queensbay mall, Eastin Hotel and Econtel, Gold Coast Resort Condominium & Resort Hong Leong and Shanghai bank, Kuwait Finance House, Kumpulan Wang Simpanan Pekerja, Fomema, Amanah Saham Nasional Berhad was inside the commercial building. Queensbay Mall is the busiest activity, offer all facility and amenities for all residents and neighboring visitors.



### 5.3 Nodes

According to Lynch, nodes is a public place or space normally people use to gather. Refer to Figure 9, public bus station is a nodes whereby public buses, taxis, and public cars used to drop off passenger. The location is strategic, near to the south entrance to the mall, bicycle rent system, police center and open parking. Coffee bean area beside the main entrance, also being a node while waiting for friends and family before enter or exit the mall.



Figure 9: Nodes at Queensbay district

### 5.4 Landmarks

Landmarks is important to direct people to the designated place. Through the observer's perception, landmarks for Queensbay district as shown in Figure 10.





**Figure 10:** Landmarks at Queensbay district.

Queensbay crown is a sculpture, built together with the mall to highlight the building. It located at open space parking beside entrance to the south mall. Due to lack of maintenance, the sculpture was hidden and surrounded by trees and bushes. Second landmark that capture observer view is Eastin Signage. It was located at Jalan Persiaran Bayan Indah to attract customer from inner road. Main entrance to the hotel is from Lebuhraya Tun Dr. Lim Chong Eu. There have 3 roundabouts with difference sculpture or trees to create the differences. It is also become focal points to the sites. Signage and sculpture inside the roundabout was built to attract peoples' attention to the site.

## 5.5 Edges

The site was nearby the sea shore. Therefore, the edge of the site can be view clearly. A lot of activity along sea shore and bicycle lane from intermediate roundabout to the south roundabout show in Figure 11.



**Figure 11:** Edge at Queensbay district

Jogging and cycling is the most famous activity along the edge of Queensbay. The track was safe to continued until Persiaran Karpal Singh. Through the observer, the activity starts at 5 pm to 7.30 pm. There was a lot of activity as shown in location B and C. People love to see sea vista towards Pulau Jerejak and Old Bridge. Fishing activities with friends and family bonding's activities i.e. picnic, gathering scatted along the sea shore. Many hawkers truck selling snacks and roasted corn was park along the road to serve the needs. The activity also creates temporary nodes to the site.

## 6. Discussion

With theory by Lynch, the observer easily can identify and recognized parts of cityscape. The five elements are stated and recorded as below to identify image of the city.

### 6.1 Paths

Looking to the paths activity, Persiaran Bayan Indah is the back bone of the city. Traffic was under control even though it was congested during peak hour. Zebra crossing in front of Maybank towards Eastin Hotel was created to solve the pedestrian crossing problem at the collector road (Figure 12).



**Figure 12:** Zebra crossing at the collector road

It is indeed plausible that streets with more pedestrian-oriented activities (shops, restaurants, services, etc.) would be more memorable, and streets that have more people on them would be better remembered (M. Mohsenin, A. Sevtsuk, 2013). These shows, pedestrian activity inside the city helps the residents and user to memorized the place.

## 6.2 Districts

Good physical characteristics of districts are determined by continuities and homogeneities of facades materials, textures, spaces, forms, details, symbols, building type, uses, Activities, inhabitants, colors, skyline topography, ...etc.(Lynch,1960). By looking to the composition of the buildings and land plot placement, Queensbay can be consider as a good layout for district combination between commercial and residential. Bay Garden was built to respect the similarity of the three stores shop lot besides. However, the idea of gated and guarded applied create a social boundary to the neighboring residence. It has been debate and discuss in several researchers regarding gated and guarded scheme and policy especially regarding strata title. Another disadvantage, there are possibility to of developer to exploit the prices due to the security purposed.



**Figure 13:** Putra Palace, South Entrance and Beer Factory.

## 6.3 Nodes

Nodes may be junctions, then they are related to paths, as being the convergence of these paths such as squares; or thematic concentration such as a concentration of shopping; or both of junctions and concentration. In fact, the city itself can be imaged as a node with respect to a large enough level. Nodes can be recognized even when they are shapeless, but when supported by a strong physical form, then they become memorable (Lynch, 1960). A few more nodes at the site which is quite important to the city was located in front of Putra Palace, where there was shapeless and the space are invisible. For residents, these are the meeting point and gathering or drop off point. South

Entrance to Queensbay mall also was one of the nodes where people only mingle in front of the entrance. Lastly, Beer Factory located in front Villa Emas was famous nodes for non-muslim and tourist.

## 6.4 Edges

Gridiron layout clearly marks not only borders of the land plots, but also public transport access. Provision of this transport access gives the authority traffic controls all over the settlement areas. All residents use these streets as a primary access for commercial routes (Hassan, 2001). The idea of primary access for commercial routes develops successfully parallel to the edge of the sea.



**Figure 14:** Penang World City's Gallery and Queens Waterfront @ Queensbay

The development has an area to expand the edges of the site for land reclamation. Therefore, there are a lot of future development will be built on reclaimed land. One of the developments will be develop by Tropicana Corporation Berhad joint venture with Ivory Properties Group Berhad. It is a future development for Penang World City. Another development will be built by Ideal Property Group namely Queens Waterfront @ Queensbay (Figure 14).

## 7. Conclusion

The development of Queensbay can be considered as new town based on all provided services such as hypermarket, banks, restaurants and other commercial building. There has a clear district between commercial and residential therefor it provides comfort living to the occupants of the residence. Even though there are more details need to consider, to recognize the five elements as a mental mapping but the main objective is investigating the basic elements at the site such as nodes, districts, edges, path and landmarks, considered successful. The modern urban design approach is intelligent city concept with a short distance and has walkable areas from one building to another. There are few interesting nodes like a few high-end restaurants which become communal space to the user. While waiting for transit bus, taxi or express bus, people can enjoy their breakfast, lunch, tea time or dinner. The site has social interaction during day time and night time. Transit system such as bus stand and taxi stand is normally fully used by the user.

Pedestrian and cycling path become leisure activities by the residents and outsiders. They love to have a gathering time at a few spots near the edge of the site. People love to do fishing activities or just sitting there to see evening vista. These activities create temporary nodes. With references to



positive activities of the residence, end user and people from local and surrounding neighborhoods, it can be considered a successful project in term of mental mapping the site.

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