

CHAPTER TWO

KEVIN LYNCH MAPPING METHOD: Physical & Spatial Characteristic Of Environment

2.1. INTRODUCTION

Years of research into city form and spatial cognition have shown that finding one's way through an environment can be a difficult task. The initial questions that need to be considered are: what are the criteria of good city form? What is the relationship between observer and environment? How the visual quality of a city can contribute to the urban legibility? This introduction addresses the basic material of this section. The task of this section is to give an overview of Kevin Lynch's theory of urban form, as set out in his book *The Image of the City*. City image is important because the ability to recognize objects in our environment is critical to our ability to act and function in places effectively (Lynch, 1981). Thus, the ability of a city is somewhat depends on its ability to be easily found and identified. Kevin Lynch made a connection between psychology and environment, at a time when many psychologists preferred laboratory experiments to the wondering variables of the complicated, real world (Banerjee & Southworth,1990). It's worth mentioning that lynchian thoughts were the solid foundation for many other theories of good urban design.

2.2. PERFORMANCE OF THE CITY

The degree of good city performance is determined by its ability of providing biological, psychological, social and cultural requirements to its inhabitants. Once these requirements have been specified, then an estimation could be made offering to which degree the city is good. Kevin Lynch in his

book *good city form* summarized these requirements in five points, they are called performance dimension:

2.2.1. Vitality

The degree to which the city sustains the essential, biological performance of human beings: this is the *supports of our bodies needs* such as water, air, energy and food, there should be sufficient supply of them to sustain life, moreover good settlement should be free of danger, poisons and disasters, then it supports safety for its inhabitants.

2.2.2. Sense

It is the degree of fit between the physical city (form) and the way people recognize and organize it in their minds. In other words, it is the degree of homogeneity between environment and observer. Sense then, reflects the *clarity with which people perceive the space*. Sense depends upon spatial structure, quality, the culture and the current purpose of the observer (Lynch, 1981). This dimension will be tackled in more detail later.

2.2.3. Fit

It is the match between the action (function) and the physical city (form), this is the requirements of our culture. It is “ how well the spatial and temporal pattern of a settlement matches the customary behavior of its inhabitants” (Lynch, 1981: 151). When there is *congruence between form and patterns of behaviors*, people feel comfortable; conversely, absence or lack of fit could make it uncomfortable and difficult to behave through an area.

2.2.4. Accessibility

That is not means the ability to reach transportation only, but to **access to all things** such as services, information, other places and to other peoples also, then an interaction is established between these variables. Access offers the degree of choice and diversity presented to us. A place should provide people with information about physical ways of reaching it.

2.2.5. Control

It the degree to which the **environment is under the control of the people** who actually use it or reside in it. According to Hall, control gives people feelings of power and stability. People feel in control when there is enough social and physical space to do as they need.

2.3. ANALYZING THE SENSITIVITY OF THE CITY

It is clearly believed that building the image of an environment is a two way process, it is the result of an interaction between the observer and the environment in which he lives. The process is not just how we see things and others, but also how others see us as a part of environment. Consequently, it reflects the influence of observer and environment on each other. “ nothing is experienced by itself, but in relation to its surroundings, the sequences of events leading up to it” (Lynch,1960: 1). **Sense of the city** as mentioned above represents the relationship between physical environment and cognition, since its components are the observer and his environment, this sense can be broken into six elements :

2.3.1. Identity

“ Identity is the characteristic that allow us to differentiate one space from another” (Arthur & Passini, 1992: 87). It is the character and spatial attributes of an object or a place that enhance the ability of recognizing and

identifying an environment, those **attributes of the object make it distinct**, ultimately unique and easily separable, then it stands for individuality or oneness (Lawson, 2001). Place identity is closely linked to personal identity, “I am here supports I am” (Lynch, 1981: 132). There is not only an identity of place, but also an identity of events which differs naturally from the first as it gives people a means to remember events that happened, thus helps them to structure their life.

2.3.2. Structure

It is how the object is placed in the space considering its **relation to the observer and to other objects**, as the object is not seen isolated from surroundings but as a part of all environmental components. “The architect has to realise that the forms of his buildings react on adjacent forms” (Moughtin, 2003: 28). Aldo Rossi considered the city as a man-made object, a work of architecture and engineering that grows through time. He said “this is one of the most substantial hypothesis from which to work” (Rossi, et al., 1982: 34). Norberg-Schulz and Lynch refer to **organization** when they talk about structure.

2.3.3. The Meaning

Meaning is **that** which the **place stands for or represent** (Lawson, 2001). It is a hidden character of the object and the deeper sense that reflects the importance of the object, this sense may be practical or emotional. For instance, the meaning of the door may be as a hole for getting out. The meaning is a complicated notion, its sides are difficult to be specified, but can be separated from the form in the early stages of analysis. A particular city may stand for enjoyment, power, vitality, mystery or something else presented in mental image of its inhabitants. Lynch says that “the **visual environment should be meaningful**; that is, its visible character should relate

to other aspects of life”¹. Steinitz (1968) made an inference that the city becomes more meaningful and known to its inhabitants when there is a congruence between its physical form and activity (Broadbent et al., 1980). People select and filter information that is meaningful to them and build their choices on it.

2.3.4. Congruence

It is the **relationship of the form to its function**. In other words, how is the environmental structure congruent with nonspatial structure. For instance, what degree of congruence between a residential building and family size?. Congruence can be tested by comparing abstraction of place with abstraction of function.

2.3.5. Transparency (Immediacy)

It stands for the degree of visibility of process occurring in the place to users. In other words, it is the **degree to which one can actually see what's going**. There are many events occur in the city such as selling, buying and movement, how many of them we can see actually. Definitely, we see less of what actually happening.

2.3.6. Legibility

It is the term that has been used for along time in urban planning defined as “ the ease with which its **parts can be recognized and organized into a coherent pattern**” (Lynch, 1960:2). This definition estates that degree of legibility depends upon the formation of **cognitive maps** within wayfarers mind (Arthur & Passini, 1992). Legibility is “the degree of distinctiveness that enables the viewer to understand or categorize the contents of a scene—the greater the legibility the greater the preference” (Bell et al., 2005: 45). It

¹ Norberg-Schulz, Genius Loci, p.5.

is the quality which makes an area understandable. Lynch considers Legibility as a physical and spatial characteristic of the environment, so visual sensations of color, motion, smell, touch and sound...etc. are all cues of orientation that reinforce legibility. This view postulates that environmental surroundings influence immediately spatial cognition, and spatial representation is isomorphic to the physical structure (Kosslyn, 1975). According to Lynch definition, legibility can enhance the identity, structure and the meaning of environmental surroundings. The city may has strong identity and character but still confusing and unclear because of confusion of its path system. Wiseman (1981) defines legibility as the degree of facility with which finding one's way is possible in a given built environment. It worth mentioning that Lynch's initial interest was of legibility, but soon the focus adjusted to the issue of the city's mental representation. This led Lynch to the concept of imageability and the identification of the city elements (paths, edges, nodes, landmarks, and districts). The sketch map drawn by city's dweller is more accurate and legible than that drawn by a visitor because image clarity is improved by familiarity and its conformity with stereotype.

Identity and structure are the formal components which help us to perceive and organize both of space and time in themselves, while congruence, transparency and legibility are the informal ones which create interaction between environment and other sides of our lives (Lynch, 1981).

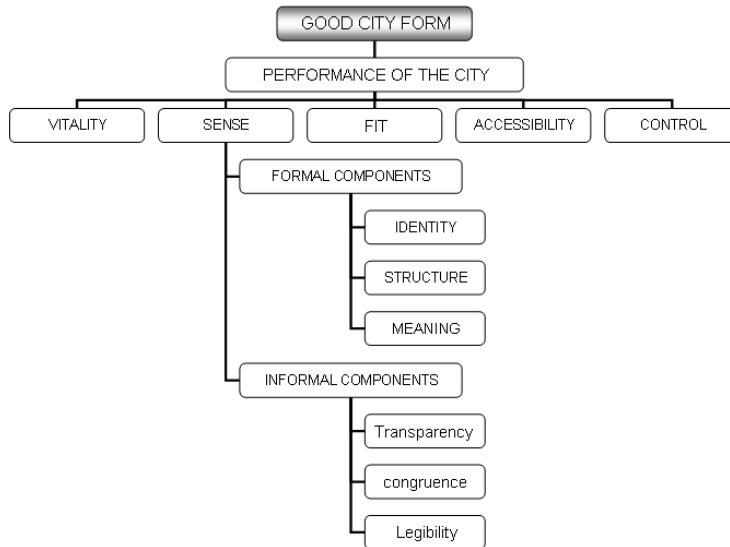


Figure 2.1. Lynch's theory of good city form.

2.4. BUILDING THE IMAGE^y

As mentioned before, **environmental image is a two-way process.** It is a complex process results from an **interaction between observer and environment,** so the image is built by **association** (Lynch, 1960).“ City order is related to the way in which people perceive or read and understand the environment” (Moughtin, 2003: 26). Lynch describes observer as a citizen who “ has had long associations with some part of his city, and his image is soaked in **memories and meanings**” (Lynch, 1960: 1). He divides environmental elements into moving elements(such as peoples, their activities) and stationary physical parts. Way-finding in his theory is related to two things: **physical elements** and a map drawn in peoples mind, this map is what Lynch named mental map or **cognitive map.**

^y Lynch, the image of the city, p.6.

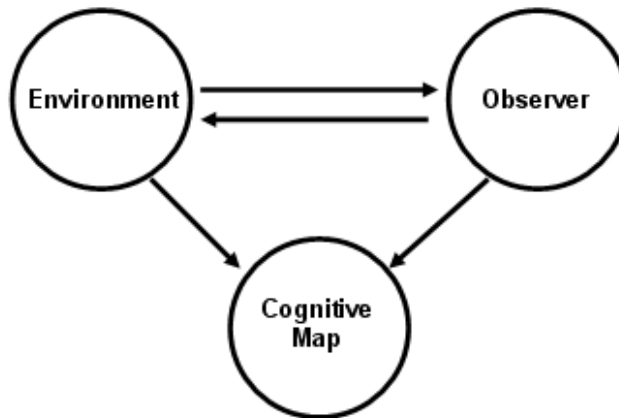


Figure2.2. The interaction between observer, and environment leads to cognitive map.

Lynch classified physical elements into natural elements and man-made ones. Natural elements are all elements that man did not make, but exist naturally like sun and rivers, whereas man-made elements are all elements that man makes such as buildings, bridges, vehicles, etc. Characteristics of environmental elements, whether they are natural or man-made, determine the visual quality of the built environment, these characteristics are what Lynch named *Imageability*, “ It is that quality in a physical object which gives it a higher probability of evoking a strong image in any given observer” (Lynch, 1960: 9). The quality of an object depends upon its shape, color, and arrangement. This quality determines the degree of legibility. Imageability has physical and cultural components; the first one defines two attributes: location (a real location, spatial relationship, prominence and scope) and appearance (shape, color, age, size, construction materials...etc.), the second component has two sides also: meaning (economical, political, social, historical, religious, functional...etc.) and association (familiarity, atmosphere and affinity) (Broadbent, et al., 1980). A highly imageable environment would have a good form, a strong identity, and would be recognizable to the common dweller. Lynch analyzed the effects of physical

and perceptible objects, and from this he was able to isolate distinct features of a city, and see what specifically is making it so vibrant and attractive to people. Peoples first create a mental map that constitutes a mental representation of what the city contains, this mental representation, along with the actual city, contains many unique elements (Lynchian elements).

2.4.1. Lynchian Elements

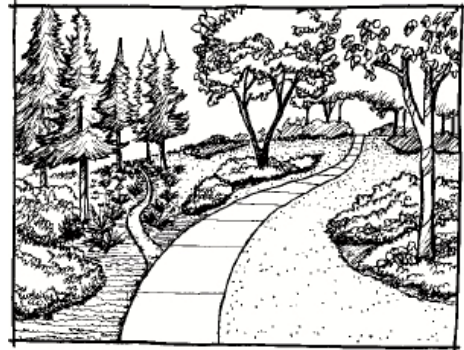
2.4.1.1.Paths

They are the channels of movement within which the city can be conceived such as alleys, streets, railroads, motorways, canals and the like. Any path has three characteristics that enhance its prominence, they are **identity, continuity and directional quality**. The path may have continuity, if there is a concentration and variation of activities along it, then people will be oriented by following the main stream of traffic. The similarity of names may also give the path its continuity. The building facades can strengthen the importance of the path and give it explicit identity, if they are distinctive and have the same characteristics. There are other special features that increase the importance of the path such as planting and pavement textures. Spatial qualities of width or narrowness can attract attention and strengthen the image of particular paths. In fact, there are many factors that may cause break of path continuity. For example, sudden change in the use building, branching of the path, and the more wider junctions along the path are all causes of breaking continuity. Consequently, peoples fail to find their way. The path is not an isolated element, it is a part of an integrated environment, so the sharp separation of a path from surroundings may causes way-finding difficulties. Any path has origin that represents the start point of the trip and destination that represents the end one, these two points if well-known and clear enough, the path will have strong identity that helps linking the city parts together. In fact, strong entrances and leaves are all together have an

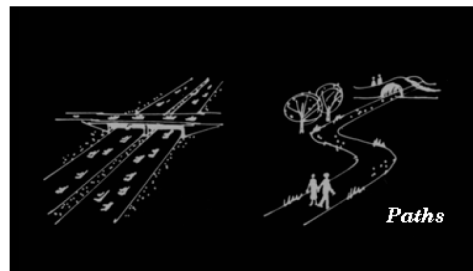
important value in creating identifiable paths. Moreover, clear hierarchy along a particular path improves directional quality as well. For instance, a gradient of use intensity and steady changes in direction of movement are all essential characteristics of strong path properties (Lynch, 1960). “When we consider more than one path, then the path intersection becomes vital, since it is the point of decision” (Lynch, 1960: 57). Lynch mentioned that perpendicular angle of an intersection is the easiest to handle, as this right angle reinforces the simplicity of the shape of that intersection. Indeed, there are two structural factors that seem to control the ability of recognizing a particular intersection, they are number of points and types of angles that tie these points. In other words, crossing of more than four points and different types of angles always cause locational difficulties. But this is not all the story, as there may be clear perpendicular, three-pointed crossing with confusion of intersection, this may refer to the shapelessness of that intersection, thus failing to communicate its structure (Lynch, 1960).



(source: Bentley, et al., 1985)



(source: Kaplan, et al., 1998)



(source: www. faculty.ksu. edu.sa /DrMohsen/ Selected Readings)

Figure2.3. Paths.

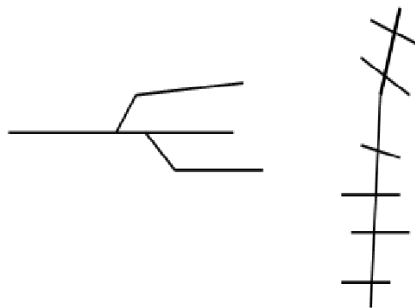


Figure 2.4. Weak paths: Branching and number of small changes along the path cause orientation problems (source: the researcher from Lynch, 1960)

2.4.1.2.Edges

“Edges are the linear elements not used or considered as paths by the observer. They are the boundaries between two phases, linear breaks in

continuity: shores, railroad cuts, edges of development, walls” (Lynch, 1960: 47). Edge is that line which separates two areas having different features from each other, this line may be natural boundary like rivers, viaducts and topography or artificial form such as greenbelt, waterfront, highway, elevated motorways or something else, as it may be just the degree of differentiation between two districts through their distinct characteristics, these characteristics may result from using different architectural vocabularies in facades, particular types of landscape elements, property of concavity, height of buildings, different types of housing, classification of activities, social classes.....etc. But separation never conditionally means isolation, as it may just stands for division. A particular edge may not be barrier at the ground level, when it is elevated such as bridges and elevated railways, these types of edges seen from below are called overhead edges. Strong edge should be visually prominent, continuous in form and impenetrable to cross movement, as unpleasant edges seem to be mentally omitted (Lynch, 1960).



(source: [www. faculty.ksu. edu.sa](http://www.faculty.ksu.edu.sa) (source: Bentley, et al., 1985)
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Figure2.5. Edges.

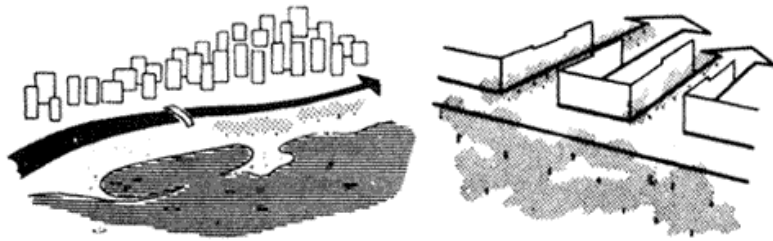


Figure 2.6. Boston water front edge (source: Lynch,1960)



Figure 2.7. Natural edge: The river as a natural edge.
(source: [www. k43.pbase.com](http://www.k43.pbase.com))

2.4.1.3. Districts

Districts are character areas perceived to have common characteristics, a separate visual identity from the rest of environment. These areas can be recognized as a thematic unit. 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). All these features give a district its identity, create intimacy between its parts, and identify the basic clues of the city. Districts **names** also play an important role in giving identity to districts. Districts may have various kinds of boundaries that offer different characters, as some may be soft, hard, certain or uncertain, thus they may reinforce or limit district identity. Districts may be in relation with each other, well-connected together, then they are in an extrovert character. On the contrary, they may stand alone to their zone, in other words they are not linked together, then they are in an introvert character (Lynch, 1960).



Figure 2.8. Districts (source: www.Faculty.ksu.edu.sa/DrMohsen/SelectedReadings)

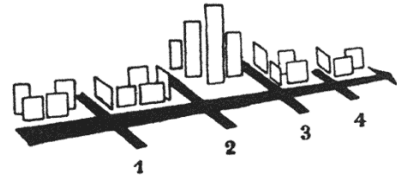


Figure 2.9. District events (source: Lynch, 1960)

2.4.1.4. Nodes

According to Lynch “Nodes are the strategic foci into which the observer can enter, typically either **junctions of paths**, or concentrations of some characteristic” (Lynch, 1960: 72). They are the gathering points such as squares, railroad stations, plazas and junctions even ordinary street intersections are 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). Good recognizable node should has its identity through singularity and continuity of walls, floor, planting, lighting, topography, silhouette, function, clarity of shape and intensity of use. Location determines nodes utilization, as locating nodes on main routes make movement economy more efficient than those located away from.

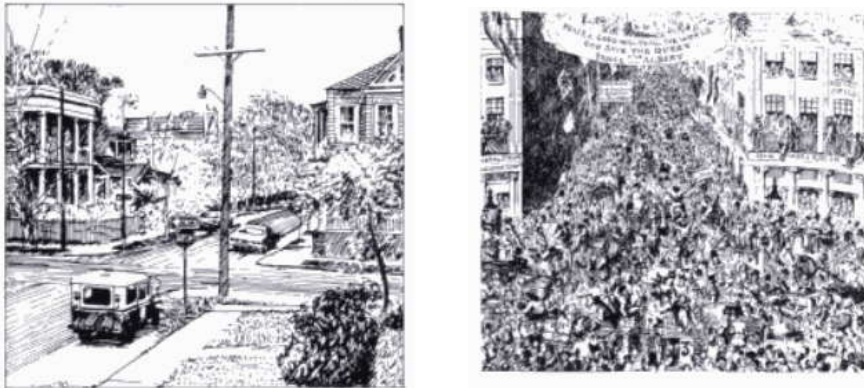
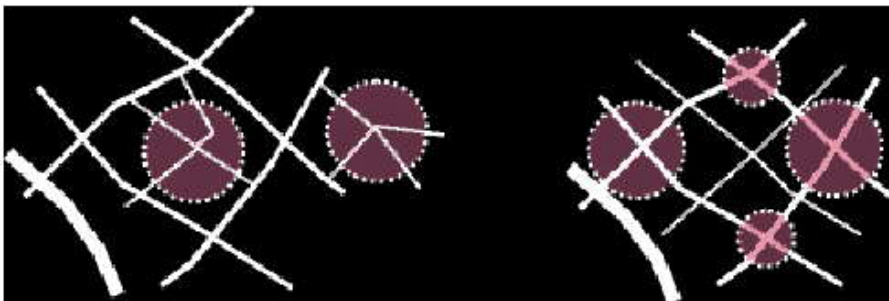


Figure 2.10. Nodes(source: Bentley, et al., 1985)



Avoid locating nodes away from the main routes.

Nodes on main routes offer more efficiency and best capture the movement economy.

Figure 2.11. Best place for nodes (source: <http://www.mfe.govt.nz/publications/rma/people-places-spaces-mar02/people-places-spaces-mar02.pdf>.)

2.4.1.5. Landmarks (Points Of Interest POI)

In contrast to nodes, which can be entered, landmarks are external features to the individual that act as **reference points** (Lynch, 1960). Landmarks vary with an individual's personal experience. They are usually static (they also can be mobile objects such as the sun) and unique objects (physical structures or geographic features) which can be singled out from a host of possibilities. Landmarks are very important cues in way-finding process when they are distinctive and not too many (Kaplan, et al., 1998). Many

peoples with different types of cognitive abilities as well as those cannot read at all or who cannot read the native language rely on landmarks to mark and remember a path (Salmi, 2002). Landmarks are distinguished by their dominance and singularity of shape, color, size, height, location, visibility and finally, their sharp contrast with background. Landmarks should be in a tune with their surroundings and not too many, as too many landmarks can undermine their helpfulness (Kaplan, et al., 1998). Landmark may be a modern building among classic ones or it may be remarkable for its cleanness in a dirty place and may also be memorable for its prominent position as seen from far and near distance; and as a place of spatial decision making when it is located at a focal point along a route.



Figure2.12. Jarring distinctiveness: lack of harmony with environmental surroundings can detract from the natural experience (source: Kaplan, et al., 1998).

Characteristics of good landmarks may be **visual, semantic or structural attractions**[†]:

2.4.1.5.a. Visual Attraction

It is concerned with the physical characteristics of an object which strengthen it as a landmark these characteristics are:

- **Façade Area:** It reflects the degree of contrast between the object and surroundings.
- **Shape:** It is measured by considering its shape factor and also the deviation of its shape from that of a rectangle. Shape factor stands for width to height ratio. For instance, high buildings have a high shape factor and vice versa.
- **Color:** Object color may single out it as an unmistakable landmark for example, a red building in the midst of a set of white ones is easily to be memorable.
- **Visibility:** If an object is located in a prominent position, then it has a high visibility, as it can be seen from near and far, by day and night.

There are other visual properties of an object such as its texture but it has been excluded because of its subjectivity and lack of formality.

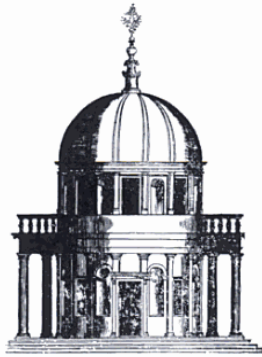
2.4.1.5.b. Semantic Attraction

It is concerned with the meaning, as the object may be not distinct in itself, but represents a great value for observers, this value may be derived from its cultural or historical importance.

2.4.1.5.c. Structural Attraction

[†] Raubal, M., & Winter, S., 2002, "Enriching Wayfinding Instructions with Local Landmarks", unpublished paper, University of Munster, Germany.

The origin of this principle is the major role that an object plays if it is located in an area of spatial decision making such as intersections.



(source: Moughtin, 2003)



(source: www.informedesign.umn.edu)



(source: Bentley, et al., 1985)

Figure2.13. Landmarks: Distinctive landmarks provide wayfinding cues.

Eventually, different circumstances can shift a particular city element type, since a highway may be a path when considering a vehicular movement, and an edge when considering a pedestrian movement. Likewise, downtown is also considered as a district regarding to city scale and as a nodal point with respect to larger level. Remarkably, all city elements are not isolated from each other, but in a series of integrated link.

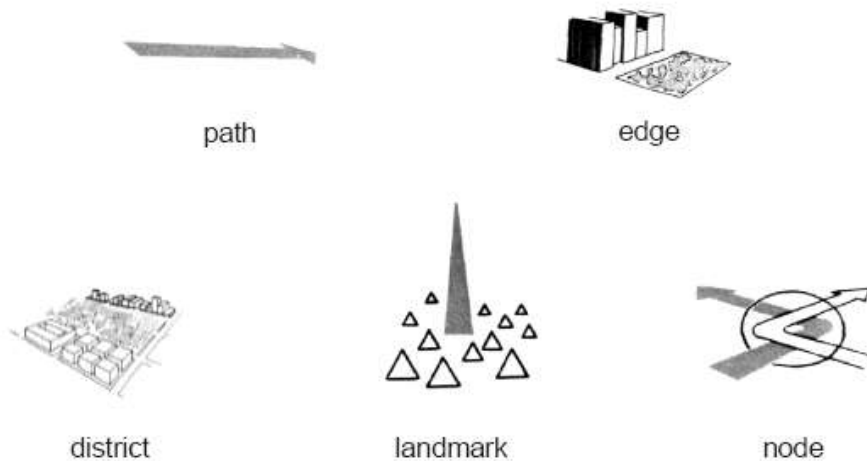
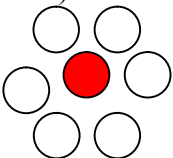
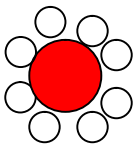


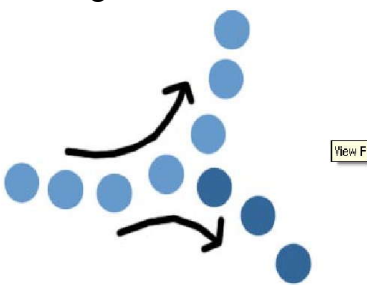
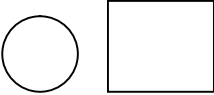
Figure 2.14. Lynchian elements (source: Klippel, 2003).

Clues of visual quality can be summarized as following:

a- Clues Related to Identity: these clues aim to single out the element through its character.

<p>Singularity or Differentiation: distinctiveness giving places there identity is a major requirement of wayfinding(Arthur & Passini, 1992). Element can be singled out if it is unique in shape, color, proportion, surface and in contrast with its surroundings, then it is recognizable. Uniqueness is very important factor in producing high degree of imageability (Dichter, 1961)</p> 	<p>Dominance: dominance of an object over others through its size, height and other physical characteristics improves image quality, since it allows simplification of an environment.</p> 
<p>Table 2.1. Clues of Identity.</p>	

b- Clues Related to Structure

<p>Continuity: It can be achieved by similarity, nearness of objects, harmony and sequence of events along paths and edges.</p> 	<p>Unity or Equivalence: “It is the characteristic to group space into zones along some common traits” (Arthur & Passini, 1992: 87). Elements should be in relation to each other, since scattered elements with no relation to each other cause confusion and disorientation. Alberti said “I shall define beauty to be a harmony of all the parts, in whatever subject it appears, fitted together with such proportion and connection, that nothing could be added, diminished or altered, but for the worse” (Beardsley, 1975: 125; Moughtin, 2003: 31).</p>
<p>Clarity of Joint: Clear relation between joints make them highly perceptible.</p>	<p>Simplicity: Simple forms such as dome, rectangle or any regular form in general, are easily recognizable. “Way-finding is hampered in environments with a very complicated spatial layouts” (Russell & Roberts, 2002: 197).</p> 
<p>Table 2.2. Clues of Structure.</p>	

c- Visual Scope: It stands for the extent within which the element can be seen for a long period and by many observers from near and far. Table 2.3. shows qualities that increase degree of exposure.

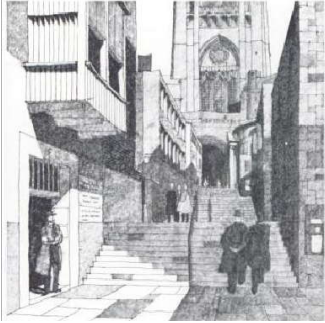
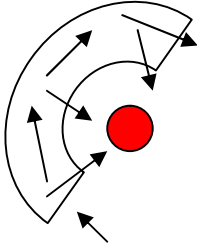
<p>Closed Vista: by creating visual scope through closing the vista by a mass</p>  <p>Figure 2.15. Closed vista: The vista is closed by the mass of the tower (source: Cullen, 1995)</p>	<p>Panorama or High Degree of Visual Access: It means that the element is visible from different perspective, this may occurs if it is placed on a curve, then the element will be seen as long as we move around this curve.</p> 
<p>Surprise: It is the arrangement of elements in a particular way within which the element appears and disappear in a sequential method. Surprisingness leads to high imageability (Wohlwill, 1966).</p>	<p>View Overlapping: It can be achieved by mixing various elements together, thus creating overlapped layers.</p>

Table 2.3. Clues of Visual Scope.

d- Names and Meaning[‡] : They are non-physical characteristics that may refer to historical, social, religious or functional significance. Names, as mentioned before, play an important role in forming the sense of a place.

[‡] Lynch, the image of the city.

2.5. POST LYNCHIAN THOUGHTS

There are many thoughts emerged later representing Lynch's thoughts from different dimensions, some of them are related to philosophy and imagination, whereas the others are more realistic:

2.5.1. Appleyard⁵

Donald Appleyard has attempted to extract factors that influence the degree of imageability while walking through the central core of a city. He found that many subjects referred to attributes of physical design such as size and shape (Appleyard, 1969). Appleyard states that the city is a product of different group perceptions. He divides these groups into two main categories: (1) The ordinary planners (2) The planner-citizens. He has demonstrated that this distinction of the two groups is a perfect example of the different perceptions individuals elicit of the city⁶. He emphasized that people should change the way they perceive an environment according to changes that happen in this environment, as mental maps need to be updated or reconstructed according to these changes. For instance, if certain landmarks change or disappear, then people's mental maps become more vague and primitive, thus they lose details of stored spatial knowledge that have been built through time. According to distinction of people's perceptions, there are three characteristic types of urban perception (Appleyard, 1976):

a. Operational

It is attributed by personal movement and visibility; when a person performs an action he uses particular environmental elements for carrying out it, we can then say that these environmental elements have an operational role such

⁵ Donald Appleyard's work in the 1960s, with Kevin Lynch at MIT and with the Ciudad Guayana project in Venezuela, explores physical form as reflected in human understanding.

⁶ Tzinis, A., 2005, The Egocentric City, M.Sc. thesis, Bartlett School of Graduate Studies, University College London.

as traffic circles, islands, intersections, signs, entrances etc. Environment should be in a harmony with the performance of tasks, otherwise it will probably be frustrating. It should be operationally satisfying, since interesting toys may be extremely dull when children try to play with them (Downs & Stea, 2005).

b. Responsive to The Configuration of The Environment

when a person perceives an environment, there are imageable elements that catch his eye; these distinctive and unique elements are not necessarily visual; they can be distinctive sounds or smells (Appleyard, 1975).

c. Inferential and Probabilistic in Nature

It is attributed by socio-functional significance; when we encounter an environment, we construct a model of likely events including significant places and screening trivial ones out. Yet, trivial places may be noticed as a sort of curiosity, so it is difficult to understand our environment without knowledge of its categories which can be acquired by wider urban experience (Downs & Stea, 2005).

2.5.2. Bentley -Responsive Environment-

Bentley I. et al. (1985) formulated a set of guidelines to make the built environment more responsive –maximizing degree of choice to users–. These guidelines include but not limited to the following:

a. Permeability: It is the number of choices/ alternatives that environment offers to people, where people can go and where they can not, so responsive places are the accessible to people. The greater the number of alternative routes, the greater people's freedom of movement and, therefore, the greater the responsiveness of that environment. Permeability should not only be in

physical properties but in visual appearance too, since paths which are not visually obvious may remain unused. Nature of spaces also influences degree of permeability.

b. Variety: It means the range of activities that environment provides to people. For example, a particular place can be used as a market where people buy and sell goods, talk to each others and perhaps visit a café. So, the environment may be not confined to housing only, but provide wide mix of uses like shopping, employment, recreation, and so forth. Variety supports permeability, as easily accessible environments are irrelevant unless they offer a choice of experiences.

c. Legibility: It means the ease with which the environment can be grasped, since the degree of choices offered by environment depends upon how legible it is. The main features that impact on legibility are paths, edges, nodes, landmarks, and districts.

d. Robustness: It describes environments that can be put up to multiple uses and thus offer their users more choice than whose design limits them to a single use. For example, changing the configuration of the furniture of a particular room may turn it to a lecture room, dinning room or place for birthday party.

e. Visual appropriateness: It describes environments which are interpreted as having meanings that help people aware of offered choices in approaches of permeability and robustness. In other words, it affects whether the detailed appearance of the place makes aware of the offered choices.

f. Richness: It is a quality that increases the choice of sensory experiences that a user can enjoy (experiences of touch, motion, sound, smell, light, and so forth). At this stage, the details of buildings and open spaces are considered.

g. Personalisation: It is the ability of people to personalize the environment. In other words, it is the ability of them to put their own mark/ stamp on their own environment. Participation is highly desirable; and personalisation quality has been necessitated by the fact that most people live and work in environments designed by others.

Permeability, variety, and legibility are all related to larger-scale environments, whereas visual appropriateness, richness, and personalisation are related to the scale of individual buildings and groups of buildings⁷. Bentley's approach of responsive environment was evolved and developed by McGlynn and Murrain (1994) who reduced the seven original guidelines to four fundamental qualities: permeability, variety (vitality, proximity and concentration), legibility, and robustness (resilience). Recently, resource efficiency, cleanliness, and biotic support were suggested by Ian Bentley (1990) and Ian Lyne at the JCUD (the Joint Center for Urban Design) to be added, to include the ecological impact of urban forms and activity patterns (Carmona, 2003; Carmona & Tiesdell, 2007).

⁷ <http://www.arch.ksu.edu/seamon/ResponsiveEnvts.htm>.

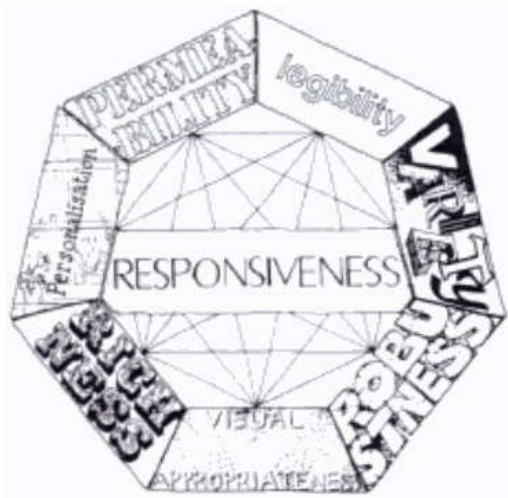


Figure 2.16. Responsive environment qualities.
(source: Bentley, et al., 1985)

2.5.3. John Cato⁸:

Cato divided city image into three components :

a. City Image

He postulated that the ability of recognizing our environment depends upon reshaping our environmental surroundings through Lynchian five elements considering exclusion of elements that cause confusion and misleading.

b. Narrative & Story Telling

According to Cato, the city is like a story, since its sequence of events can be narrated and described by presentation, believability, color, attraction, familiarity, surprise, and so on⁹.

⁸ John Cato is a practicing designer, looking for practical ideas that may help with design strategies of an interactive system. He worked in this field since 1989. this text was first presented at a workshop on narrative and hypermedia in Brighton, 1997.

⁹ <http://www.softdesign.co.uk/cityimg.htm>

c. Interaction Design

We should attempt to create an involving, attractive and enjoyable interactive environment, one which encourages us to use and delight in our use. Space should be multi-dimensional and rich in artifacts, yet at the same time some essential underlying simplicity that communicates and draws us in¹⁰.

2.5.4. Jonathan¹¹

Jonathan Raban (1975) divides the city into soft and hard parts. The soft city is created by the minds of its inhabitants, so it is individualized interpretation, whereas the hard city is the concrete ideas such as alleys and architectures. In other words, the soft city is concerned with the mental side which need to be exercised by the imagination of city dwellers, but the hard one resorts to the material level observed by the sense of dwellers. The two parts are interactive and closely related. According to Raban, the city visitor first encounters the hard city, but gradually he will feel it and then he encounters the soft one.

“...the city goes soft; it awaits the imprint of an identity. For better or worse, it invites you to remake it, to consolidate it into a shape you can live in. You, too. Decide who you are, and the city will again assume a fixed form round you. Decide what it is, and your own identity will be revealed, like a position on a map fixed by triangulations. Cities, unlike villages and small towns, are plastic by nature. We mould them in our images; they, in their turn, shape us by resistance they offer when we try to impose our own personal form on them.” (Raban, 1975: 3-4)

¹⁰ <http://www.softdesign.co.uk/cityimg.htm>.

¹¹ Jonathan Raban (b. 14 June 1942, Hempton, Norfolk, UK) is a British travel writer and novelist.

Raban imaged the city as a living object, it interacts with its dwellers and calls for its own identity. Both of the city and its dwellers seek to impose their images on each other. Furthermore, Raban claimed that all cities are theaters; Every city has its own story and every citizen plays his own part at that story. He discussed the way people remember their cities whether through memories of the streets they have actually visited or streets they imagine. He goes on to describe mind construction as a kind of stage set that we create and in which we play out our part; some of us succeed at this game but many of us suffer from a sense of dislocation and lack of community.

Raban has emphasized that individuals interact with environment not through its physical elements, but in relation to the quantity of information that they receive and store along their daily life, since various space events help an observer to interpret the inner meaning of all constructed shots within that space.

2.6. HOW TO USE LYNCHIAN METHOD EMPIRICALLY?

Lynch carried out an analysis of three American cities (Boston, Massachusetts; Jersey city, New Jersey; and Los Angeles, California) in order to evaluate the components of perception at the group level. He choosed small samples of interviewees for his study: thirty persons of Boston and fifteen each in Jersey and Los Angeles. Interviewees were from professionals and managerial classes. There were two basic types of analysis:

2.6.1. A Systematic Field Reconnaissance

It starts by finding out the existing potential by the site and its surroundings. It is made on foot by a trained observer who maps the area and explores the visibility of it defining its elements and recording any existing activities and forms which could be used to make the place more legible, dividing them

into major and minor categories according to significance and strong visibility. The map resulting from this analysis is an abstraction of the true physical map, since the mapping process itself is subjective and done independently from the interview analysis. Automobile survey can also predict the probable composite image, as there are some minor elements that could be neglected in foot survey.

Lynch's checklists of elements are helpful here for stimulating the analysis¹²:

paths:

Recording routes that adjoin or cross the area; classifying them according to their significance in the area.

Edges :

Recording any strong linear barriers and any distinct limits to areas with different patterns of use or visual character.

Landmarks:

Recording any distinct elements wither in shape, meaning or location.

Nodes:

Recording focal points like squares, intersections, and plazas; recording buildings that attract people and create movement like cinemas and shopping malls.

Districts:

Recording areas that differ from each other in character and use specifying factors that outline these differences like material and form.

¹² Bentley, I.(Ed.), McGlynn, S. and Smith, G., 1985, Responsive environments: a manual for designers, Architectural Press.

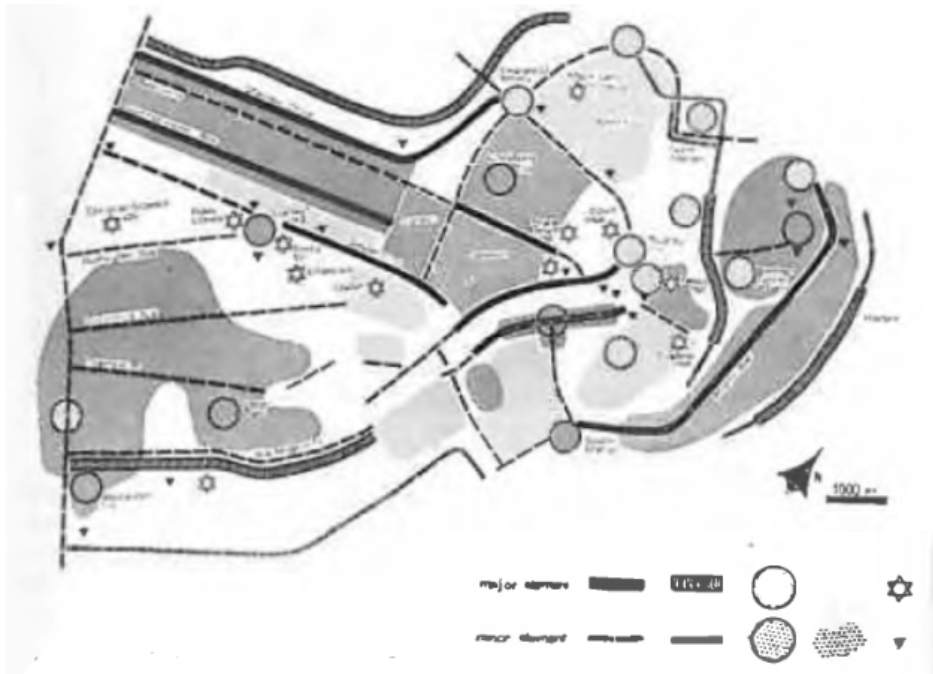


Figure 2.17. The visual form of Boston as seen in the field.
(source: Lynch, 1960)

2.6.2. Interviews and Questionnaire

Questionnaires provide a means of gathering a snapshot on the views of observers, thus extracting cognitive map of an environment. The people interviewed are carefully selected:

- Choosing people who frequently use the site, or its immediate surroundings.
- There should be a balance in sexes, and ages in the sample.
- The number of people interviewed is about 20-30 for every area.

An interview can be held with the sample of a city in order to elicit their own image of the environment within which they live. The interview made by Lynch and his team contained many points (Lynch, 1960):

- Interviewees were asked about their first impression about the area: what first comes to their mind about it?

- Interviewees were asked to draw a sketch map of the area showing the location of most important features, and placing map details as if they describe it to a stranger.
- They were asked to draw an imaginary daily trip illustrating the sequence of events would they see, hear or smell. The path chosen for this trip should be rich in its components giving a general description of physical features of a case study.
- Subjects were asked to select the most distinctive elements listing and describing them; explaining why they had included them on their maps. These distinctive elements might be streets, buildings, sections or any physical features which are meaningful for a person, thus worth to be mentioned (Downs & Stea, 2005).
- Subjects were asked what they like and dislike about the area and how much they like it?; what they like to change in it?
- There are informal questions about the goals of the work; importance of orientation and recognition of a city to people and the degree of satisfaction when subjects find their way and able to locate themselves in a city.
- Interviews were recorded on tapes; and several photographs of a city and several cities were arranged randomly, then subjects were asked to classify them according to their familiarity, and placing them on a large table as if photographs were placed on a large map of a city (Lynch, 1960).
- Sketch maps can be classified according to their accuracy and completeness, thus excluding weaker ones.
- Maps obtained from interviews and questionnaires can be synthesized into a single citizen map, since there were repeated elements in subjects sketch maps.

- The above interviews and questionnaires are subjective, so they need to be compared with an objective description of a physical map that can be supported by air photos and diagrams density and use.

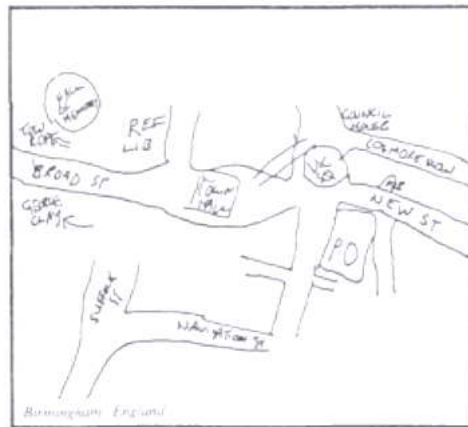


Figure 2.18. A sketch map drawn by an interviewee.
(source: Bentley, et al., 1985)

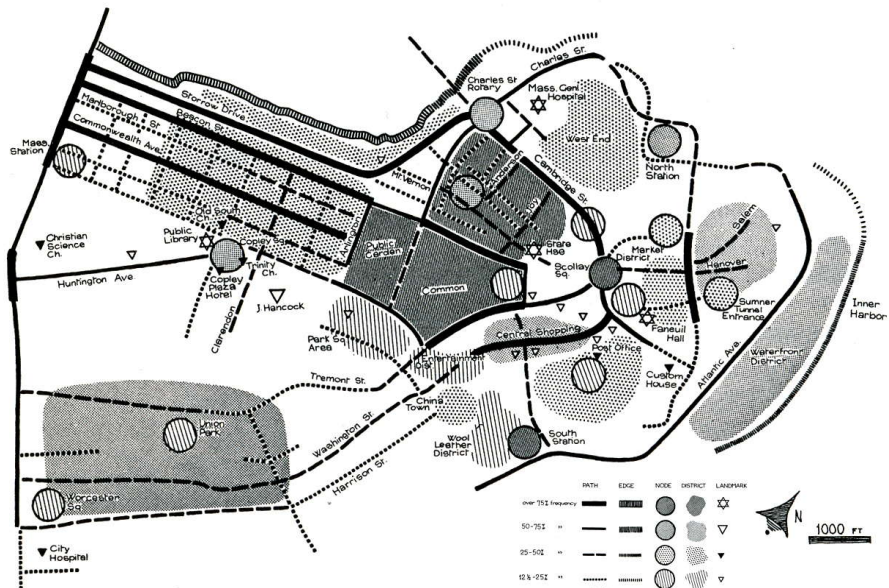


Figure 2.19. The Boston image as derived from verbal interviews (source: Lynch, 1960)

2.6.2.1. Techniques of Inquiry

2.6.2.1.a. Local Work Places and Cafes

By asking people a set of questions during a break. This is the most common way to get people drawing their own images. Providing standard sheets is helpful. What we try to investigate is how people see the area, not how it is.



Figure2.20. Local work places interviews (source: Bentley, et al., 1985)

2.6.2.1.b. Doorstep Interviews

Doorstep surveys are done by going to people's homes (usually chosen random) and asking them a set of questions. These techniques are little used, although they are useful for tapping the view of local residents and their memories about events happened in the area. Through interviews, we do not lead the answers, but people are the experts.



Figure2.21. Doorstep interviews (source: Bentley, et al., 1985)

2.6.2.1.c. Street Corners Interviews

It is done by stopping peoples and asking them a set of questions about the place, with one or two photographs to stimulate conversation. It will be a good result to get answers from more than one in ten people.



Figure2.22. Street corners interviews (source: Bentley, et al., 1985)

2.6.3. Getting A Cognitive Map

Analyses of interviews reveal a considerable overlap between different people's images of a given environment, enabling a shared image to be mapped. Maps are analysed according to frequency of elements; after that, the results are compared. Legible layout is that people are able to form clear and accurate images of it.

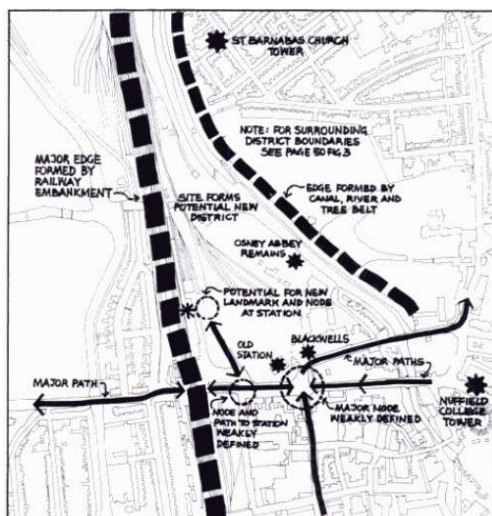


Figure 2.23. Analyzing a map by using Lynchian method. (source: Bentley, et al., 1985)

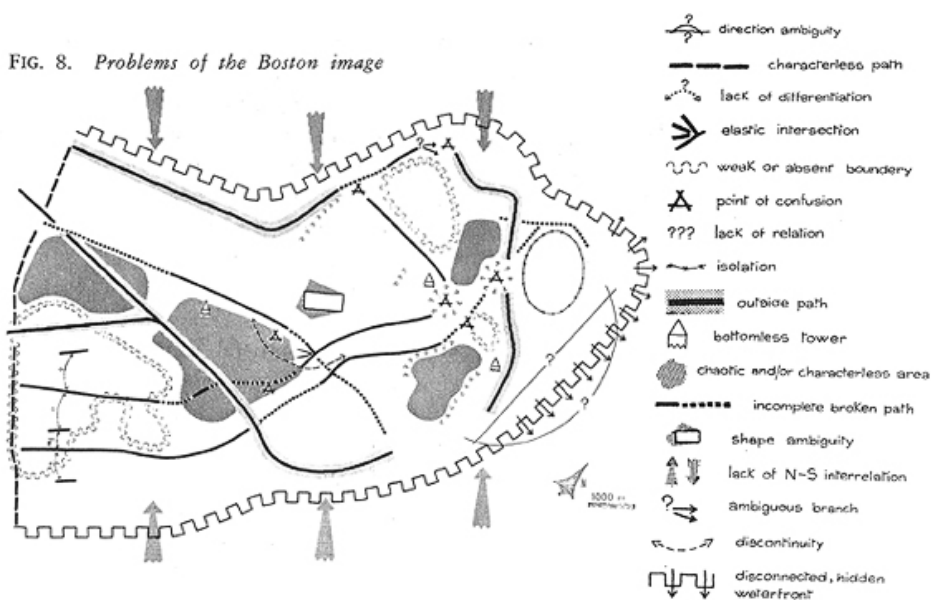


Figure 2.24. Problems of Boston image (source: Lynch, 1960)

2.7. CRITICISM ON LYNCHIAN METHOD

a. “ A major criticism of Lynch's original study centered on the nature and selection of the sample of respondents” (Downs & Stea, 2005: 80). The sample size that Lynch and his team interviewed was too small and biased, since interviewees were thirty in Boston, and fifteen each in Jersey and Los Angeles. They also were all young, middle-class people, and most of them were professionals (Banerjee & Southworth, 1990), while there are several factors control sketch maps such as class, gender, age, culture and familiarity. In other words, Lynch neglected the observer variation in his study, so the validity of aggregating the mental images of subjects with different experiences and backgrounds has been questioned. But it was astonishing that the basic ideas of the city image have held when they have been applied in different places with different cultures, so Lynch's team were lucky.

b. Using interviews and questionnaire for getting true mental image is inadequate method. Furthermore, map drawing is too difficult for most

people. Although the comment is just, as entering the charming realm of psychology is a difficult mission because what in the mind is an elusive matter, Lynch has claimed that sufficient array of investigations can produce more realistic image that tend to be the true one, moreover environmental image is enjoyable for most people, since they like to talk about it (Banerjee & Southworth,1990). Although talking is more familiar than drawing for most people, drawing should not be neglected, since it is a valuable means of expression conveying the inner feelings of interviewees.

c. Design usurpation: researchers worried that Lynchian method may control designers creativity, thus leading them to repeated templates. Lynch refuted this attack claiming that perception studies could support and enrich design.

d. In *good city form* Lynch reduced the emphasis on legibility considering it as one kind of sense. Furthermore, he downplayed its significance in reconsidering *the image of the city* (Carmona, 2003). Lynch's studies have focused on way-finding issue, although he accepted it as a secondary problem for most people, since individual can find his way by asking peoples or using a map. Although Lynch assumed the importance of wayfinding issue and analyzed its nature accurately enough, he did not demonstrate it. In other words, he just questioned the value of legible environment and proved it indirectly. For instance, it may be argued creating legible environment obscures the hidden value of mystification that beckons one to explore further, but Lynch refuted this criticism indirectly claiming that getting lost is intolerable strain assuring that "...self-identity is reinforced by a strong identity of place and time" (Banerjee and Southworth,1990: 250), moreover there is a satisfaction and pleasure of identification with a distinctive home place.

e. Lynchian method has focused on objective and physical aspects of urban environment with less attention given to cultural and social aspects.¹³

f. Lynch defined three formal components for the sense of perceiving an environment: Identity, structure and the meaning, but he confined his study to Identity and structure excluding the meaning (Crane, 1961), although meaning plays an important role in improving the imageability of the city (Broadbent, et al., 1980: 164). In other words, cognitive mapping techniques tend to neglect issues of people's feeling toward their environment and what actually it means to them. Lynch also confined the visual perception to forming the image of a city obscuring other significant factors associating in image formation such as sound, smell and tactile (Southworth, 1969). Lynch emphasized the seeing aspect of the imagery, while cognitive image is a product of an integrated multimodal representation that involves visual aspect and many other inputs (Downs & Stea, 2005).

2.8. CONCLUSION

¹³ Salheen, M., 2001, A comprehensive analysis of pedestrian environment: The case study of Cairo city center, Ph.D. thesis, Heriot-Watt University, Edinburgh College of Art, Faculty of Environmental Studies, School of Architecture.

This chapter briefly described Lynch's theory about urban form and some other relations.

First, we explained Lynch's thoughts about good city form by measuring the degree of city performance which expresses the environmental requirements of the city through its vitality, fit, sensitivity, accessibility and control. We then briefly focused on sense of the city dividing it into six elements, these elements are identity, structure, meaning, congruence, transparency and legibility.

In the next part of the chapter, we explained the five elements of the urban environment: paths, edges, districts, nodes, landmarks. After that, we mentioned some new theories related to Lynchian thoughts.

In the last section, we explained how to use Lynchian method in analyzing city image illustrating how to get a mental map of an area.

The final part was a criticism on Lynch's method and his thoughts about urban Legibility. The criticism was basically confronted to the basic relevance of Lynch's studies and vivid obscuring of many aspects like culture and social aspects and the meaning.