

TECHNOLOGICAL MAZE DEPLOYMENT FOR A BETTER CITY LIVING.

Elena Elisabetta MINGHINI ¹

¹ Dipartimento di Ingegneria Edilizia e Territoriale, Facoltà di Ingegneria, Bologna, Italy,
email: eleminghini@libero.it

ABSTRACT

This paper like mean any reflections about the role of technology in better urban living.

According to this purpose, it consider dissimilar ways to study the quality of life in those cities that have adopted new approaches to the urban design at the different scales: new technology opportunities employ in to the project of infrastructures, of the green areas and of the building blocks.

In the North American and Europe cities live varied design assessment criteria and more or less advanced ideas of technological intervention in the project of the city.

It seems advantageous to adopt this several criteria for define better urban design objectives: a distinct sense of place responding to local context; continuity of frontages and clearly defined public space; an accessible, well connected, pedestrian friendly environment; flexible and adaptable public and private environments.

KEYWORDS

Fallow land - urban materials - activity flows - city life quality - new design criteria

1. INTRODUCTION

The spatial relationship between different land uses helps to determine levels of car dependence, accessibility, community and equity. It is therefore vital that each land use not be treated as a separate planning problem, as this can result in a disaggregated and dispersed pattern.

A strategy for urban regeneration relies on accommodating most new development within existing urban area, by reusing and recycling buildings and brownfield sites.

Urban form is defined as the distribution and pattern of human settlement within the city region. The key variables are density, shape, degree of dispersal or concentration and the quality of the infrastructure for public transport.

The idea of compactness has fairly obvious health and sustainability benefits compared with a dispersed pattern: trip lengths are shorter (than a dispersed pattern) and there are more opportunities for exercise through walking and cycling; car dependence is lower, reducing level of air pollution; a wide choice of facilities is within easy walking distance, promoting greater access to and choice of food; land values can be sufficient to encourage urban renewal and regeneration; the vitality and viability of the city centre is bolstered, improving the economy and providing more employment opportunities; buildings and materials are reused, reducing energy and resource consumption; access to rural open space is improved, providing opportunities for increased recreational activity.

Nevertheless, compactness can create problems in terms of excessive density, loss of open space, high housing prices (leading to social exclusion) and implementation.

The urban regeneration strategy applies to regions with moderate growth where economic restructuring is occurring or where current gross urban density is low. A strategy for compact growth should be considered when the urban area has insufficient capacity to accommodate growth predicted. The strategy then is to release land close to the city with good access to urban facilities by foot, bicycle and public transport. Development on Greenfield sites is not seen as an alternative to regeneration but as a supplement.

The compact growth strategy is likely to apply to cities that are growing more rapidly but are still relatively small. It is not appropriate or even possible for conurbations.

A strategy for focused decentralization is a development of the strategy for compact growth that is adapted to the larger canvas, giving a focus for the decentralizing forces of the market.

The focused decentralization strategy attempts to deflect some of the growth potential into suburban towns or free-standing commuter towns with the aim of making these more self-sufficient in jobs and services, effectively counter-magnets to the main city. The strategy is particularly appropriate for highly urbanized regions with clusters of closely linked cities.

Further peripheral growth of major cities (perhaps over a 5-km radius or about 250 000 population) should be viewed critically.

If the strategies to obtain a sustainable urban form are to succeed, then some control must be exercised over the activities location; the potential benefits in terms of air quality, safety, accessibility and equity are considerable.

The evolutionary root of contemporary urban settlements.

The foundation was laid for the modern city in the mid-19th century, with the construction of canals, locks, sewer systems, railway net-works, industrial plants, new residential neighbourhoods, and national and international exhibition

grounds. Streets replaced demolished city fortifications; decrees were passed to protect forest areas. In the first few decades of the 20th century, people continued to build cities on this foundation.

Between the two world wars, nearly all industrial societies realized exemplary projects as they sought appropriate urban organizational concepts and forms of expression for the new lifestyles of the age. These projects unleashed international debate and exerted a major influence on urban development at a local level.

After the devastation of the Second World War, city dwellers cleared enormous amounts of rubble from their streets at record speed. Power plants, facilities for water, air and land transport, residential districts, schools, hospitals, shopping centers, administrative buildings and museums were built. Later came facilities for water pollution control and environmental protection.

These developments shaped our youth, showing that city construction started with projects for the acquisition of urban land. There are various land reclamation strategies.

Laws were passed in the late 19th century to control the increasing destruction of woodland that accompanied urbanization. In the 20th century, forests became the most stable element of the landscape in these countries.

The design and development of cities has always been significantly influenced by water and hydraulic engineering technology, whether for drinking water supplies, waste water management, transportation by water, drainage or irrigation.

Up until the second half of the 20th century, the mostly swampy valley floors, which were normally flooded in spring, were drained using elaborate drainage systems. The objective was to reclaim fields for the increased food demands of city dwellers. These "melioration" projects were started in the early 19th century. Before the melioration process was completed, some of these agricultural areas were left fallow again. And yet due to their flatness, large size and easy accessibility, they were quickly put to a new use and opened to automobile traffic. The agricultural areas produced by drainage are now crisscrossed by highways and dotted with rest stops, shopping centers, commercial buildings, automated transshipment centers, warehouses and parking lots. They are largely independent of their urban surroundings, possessing their own catchment area, either nearby or at a distance.

Hydraulic engineering installations and the land reclamation they facilitated exerted a significant influence on the transformation of settlements. The engineers set out to harness destructive water flows and ended

up creating new settlement flows with striking modifications of the landscape.

To a great extent, contemporary urban culture has been driven by the desire for comfort and efficiency, with new technologies playing a major role in the fields of energy generation, thermal storage, heat transfer, and hygiene. These new technologies exploit water in a variety of ways. Switzerland is a prime example of this development. In order to meet new requirements, the river system was dammed in several places and guided to power plants by incredible feats of civil engineering.

Electric current was transmitted from these power plants to outlets across the country, allowing a quick switchover from handwork to use of appliances and machines - a development we take for granted today. Nuclear power, a later rival of hydropower in generating electricity, also depends on great water flows for cooling processes. Today, energy transformation installations, often situated far from urban settlements, are essential components of the city's physiological system -as are thermal power plants, which are based on the burning of fossil fuels and have impressively changed the face of the landscape.

Drinking water supply and wastewater drainage were set up parallel to the creation of electricity networks. In urban cultures the greatest quantity of water is consumed for hygiene, as well as of the expanded urban environment, including buildings, machines, transportation facilities, garden and vegetable-growing installations, and even of the facilities needed for hygiene.

2. TECHNOLOGICAL MAZE AS URBAN GENERATOR

This development is the most important reason for our view of technical infrastructures as generators of the contemporary urbanization of the planet. All these structures taken together form the partially visible, and yet mostly invisible substructure the foundation of modern urban settlements. This foundation, the scale of which is difficult to perceive, encloses and penetrates landscapes, expanding and interweaving like roots in a forest. It functions as a fertile soil for urban settlement forms that emerge suddenly and at every conceivable place like plants on the forest floor.

In addition to the structures required for water and energy supplies, there are five additional components of the technical infrastructure that have had a critical influence on the evolution of contemporary urban settlements: transportation routes for trains (steam at first, then diesel and electric locomotives); for the automobile with its internal combustion engine; for aviation (aircraft and air traffic control systems); for cable and wireless telecommunications; and finally for long-distance heat distribution.

In the mid-19th century, the railway revolutionized the transport of heavy goods and passengers. People can now travel long distances safely, at any time of day,

and in any weather. After the coming of the railways, forests were cleared in order to acquire wood for steam locomotives and sleepers. Mountains, valleys, rivers and swamps could not stop the construction of tracks. The railways made it possible to transport heavy industrial goods and stockpiles of raw materials such as ore and coal across continents and, in combination with ships, beyond continental boundaries. This laid the groundwork for large scale industrial production that was increasingly independent of local resources.

In urban areas, railway stations were usually built in front of the city gates, or were used to justify their demolition. As cities expanded, the location of public activities shifted. In large cities where subway systems were gradually being built, these activities moved to outlying districts. The center-periphery model of urban development emerged, since train stations, like ship harbors, produced converging flows of passengers and goods.

This contrasts markedly with the automobile, which enables greatly divergent and greatly convergent flows of goods and people. It can also adapt more effectively to different types of terrain and traffic conditions than the train. This radically changed the territorial arrangement of activities that had been passed down from generation to generation.

With the invention of the internal combustion engine and the use of asphalt in street construction decades later, the car came to rival the train as a means of transport. In Europe and the USA, these inventions spawned two different urban cultures. Europeans favour the complementary use of both transportation systems; with the construction of high-speed trains in the late 20th century, they even stimulated competition between automobile, air and rail transport. Americans, on the other hand, stopped expansion of the rail network in the mid-20th century and focused entirely on aviation and the private car as a mass product.

And yet both cultures share the belief that the car can best guarantee the freedom of movement and freedom of settlement promised by open, democratic societies. It also became evident that the depletion of land resources and the problem of noise and carbon monoxide emissions had taken on such threatening dimensions due to mass automobile use that energy-efficient technologies and regulatory restrictions were necessary.

Starting in the late 1950s, rail routes were electrified and expanded. Highways were built in national projects and connected to form cross-continental networks.

In parallel, the construction of wide-bodied aircraft, tankers, and container ships, as well as advances in signal and satellite technology resulted in new, immeasurable opportunities for transport and communications. The movement of people is almost unlimited, and enormous quantities of goods and information can be transported at high speeds over long distances without interruption. Through the combined use of tankers and pipelines, entire continents can be supplied with oil and natural gas, and water can be brought to desert regions.

Starting at automatic loading ramps, container ships transport enormous masses of goods through out the world. As a result the primary sorting of goods transported between continents now costs roughly the same as retail distribution on any single continent, and is therefore no longer a significant factor.

These developments have caused mass transportation and mass tourism to blossom worldwide. At home they would only experience these things via cold, indirect media such as TV. The Internet and wireless data transmission constitute a temporary high point in the parallel evolution of individual communications. These technologies enable us to communicate with others around the world, independent of place and time. Human beings have made the planet a global village.

Modern climate control technology has developed on the basis of the above-mentioned technical infrastructure. For the production of warmth, wood was first replaced by coal, then by mineral oil, natural gas and electricity. This has brought changes in both interior and exterior climates, since the smoke and fumes that characterized the climate of 19th-century cities are disappearing and giving way to a postulated environment of clean air and light. The transformation at the turn of the 19th to the 20th century evolved from the contemporary debate on dirt, disease, hygiene and health in urban settlements.

Modern climate control technology is able to fulfill far more ambitious urban desires than the need for high-quality interior air and tight. An example of this is the desire to live in artificial environments, free of naturally existing or changing environmental influences. Such a scenario requires the capacity to create the desired climate (the darkness of night, lightness of day, summer heat, winter cold, dry-ness, humidity, etc.) at any time, and at short notice. Climate control technology is used not only for agricultural production (e.g. greenhouses), botanical gardens, zoos, hospitals, work-places situated above and below ground, department stores and passenger lounges. The differences between art and nature are shown in a new light here, since living nature has evolved on the basis of a sweeping architectural landscape, and art is embodied in the forms of living nature. As contemporary urban settlements have emerged, technical infrastructure and climate control technology have fundamentally changed our relationship with our surroundings, our perception of the landscape and our understanding of nature and history. They have also helped bring about a fundamental reshuffling of the daily rhythm of our lives, and a reorganization of the times and places of human activity.

What is important about this transformation process is the dwindling significance of natural conditions at the local level; the importance of the time dimension and the shortening of space in our perception of distances; the enormous masses of people, goods and information transported; the subtly differentiated distribution patterns; the rapid availability of energy, services, and products all across the planet; and the complementarity or competition of the

network of communication systems. These encompass nearly the entire planet and form the basis of the globally emerging network society.

And yet it would be mistaken to try to understand the evolution of contemporary urban settlements based solely on the building of technical infrastructures or developments in climate control technology. Settlement history is too complex to be explained by a cause-and-effect model. In our perception of historical phenomena, we repeatedly find they are the result of multilayered conflicts that continually replace each other, conflicts that we trigger as subjects and that incorporate us as subjects. Their consequences are manifested in art, science and technology in manifold ways, as well as in individual and collective memory.

These have exerted a critical influence on the self-conception of the era and the realization of urban settlements.

3. NEW DESIGN ASSESSMENT CRITERIA FOR A QUALITY CITY LIVING

The term "city" is closely linked with the settlement centers of an ancient farming culture and the industrial cities that evolved from it at the beginning of the 19th century. In this period of history there was a clear separation between city and country life, both morphologically (in the arrangement of territories) and physiologically (i.e. the management of resources). The lifestyle of the rural majority differed greatly from that of the urban minority. This contrast is reflected in the music, painting and literature of the 19th century, when European industrialization was still in full swing. In the second half of the 20th century, the separation completely disappeared in many European and North American regions. By that time, more than 90 percent of the population was living in city areas. From a sociological and physiological viewpoint, urban life became "location-less". The near-perfect linkage with "urban infrastructures" (once reserved for cities) made urban life possible against any number of backdrops. The succession of building periods can only be seen morphologically in the settlement pattern. In the following discussion, the term "urban system" will replace all previously used terms to designate the object under study.

The urban system is a large system made up of geogenic (emergent with the earth) and anthropogenic (emergent with human kind) subsystems. It covers an area of tens of thousands of square kilometers and has a population density of hundreds of inhabitants per square kilometer.

It is an all-encompassing three-dimensional network with diverse social and physical links.

A relatively high concentration of people, goods and information exists at the nodes of this network, and there are massive flows of people, goods and information between the nodes.

Colonized agricultural and forestry ecosystems and waterways are integrated components of the system.

In the individual geogenic and anthropogenic subsystems, the dynamics of the different processes (flows, cycles, turnaround time for goods, etc.) differ greatly. The urban system is marked by a blurring of the boundary between city and country. It presupposes a high degree of mobility for people, goods and information. This mobility gives inhabitants quick access (within one hour of travel) to all activities and services that were once provided solely by the traditional city (in the sense of an urban center). The urban system manifests itself as a large-scale urban cultural landscape in which there is no distinction between urban and rural space.

The most pressing task when designing the urban is to detect the problem field in the selected urban system. This involves identifying specific problems and possible solutions, testing and evaluation solution concepts, and either rejecting these concepts or developing them into project frameworks.

The urban system is identified based on five network elements: nodes; connections; borders; levels, scales.

It is structured into seven activities: to nourish; to entertain; to clean; to reside ; to work; to transport; to communicate.

It is shaped on the basis of four key resources: water; food; building material; energy.

It is topographically represented in seven types of territories: waters; forest; settlement; agriculture; infrastructure; fallow land; interstice area.

It is evaluated according to five quality criteria: identity; differentiation; malleability; intensity of self-sufficiency; resource efficiency.

Identity refers to the identifying characteristics of an urban system, communicated by various media. These characteristics create orientation and order within space and time, and are therefore essential for the urban existence.

Identity in this sense is a gauge of the urban system's ability to provide people (inhabitants and guests) with unmistakable images (icons) of its essential features, to which residents can relate and which create a sense of home, security appeal, wellbeing and creative inspiration. These images must enable residents to distinguish themselves from all other people and capture the essence of their lifestyle. They are a bulwark against "chaos", and provide a path through the labyrinth. The images may consist of individual buildings, landscape elements, sounds, colours, lights, groups of people and cultural institutions, as well as combinations of these.

Differentiation describes the different ways a certain function in an urban system can be performed, e.g. the different ways people can be fed and transported, a house built, or a consumer product manufactured.

A certain degree of morphologic and physiologic diversity is vital to life. The same functions are manifested in various ways. Expressed negatively, a homogenous, unitary urban structure is inimical to our existence. This becomes evident if one tries to imagine a city with just one type of residential building or one means of transport.

Malleability describes the system's ability to handle internal and external change in two ways:

- the system does not change (homeostasis.-buffer capacity)
- the system is renewed or improved (evolution, potential for innovation).

Malleability thus signifies the system's ability to respond to differing conditions and requirements adequately, i.e. in a way that ensure survival. This behaviour includes the variable use, mixed use, and leaving fallow of changeable space, occurring at different speeds. Too much flexibility can create unstable conditions, impairing identification with the system (loss of orientation) and making it impossible for inhabitants to cope with the economic and environmental consequences of such great changes. Rapid growth and decay can also result in unstable conditions. The flexibility of urban systems must be studied over longer periods of time and can only be understood dynamically.

Intensity of self-sufficiency describes the relationship between available regional resources and the resources that the region requires to meet its needs.

This relationship determines the physical relationship between the region and its hinterlands. The goods relevant for this relationship are primarily vital resources, such as water, food, construction materials and energy sources.

A intensity of self-sufficiency of 1 (or 100 percent) means in theory that a region is "autonomous".

However, from an economic viewpoint, regions with a high or low intensity of self-sufficiency can cultivate a busy exchange of goods with their hinterlands. The term "hinterlands" is used here to describe all the systems (anthropogenic and geogenic) situated outside the observed urban system and interacting with it. Sometimes this interaction is on a global scale (the urban system as part of the hydrologic cycle or carbon budget), in others it only affects adjacent systems on a regional level (e.g. import or export of certain building materials or other goods).

Resource efficiency denotes the relationship between the quantity of a resource utilized and the quantity that is available. It thus describes the relationship between the resource consumption of an anthropogenic activity (e.g. transport of people, food preparation, housing) and the area, energy and materials necessary for it. This "observation of physical efficiency" complements the cost-benefit analysis common in economic study. The greater the efficiency, the "more

powerful" the system - provided that a high degree of physical efficiency is economically advantageous. It is important, to realize that increased efficiency can be achieved not only through technical improvements but also through behavioral changes. It should be obvious that additional and different criteria could be chosen. Nor is greater population density in an urban system synonymous with a higher quality system. An urban system with low population density (inhabitants per surface area) can theoretically be more resource-efficient than one with greater density, for example, when the inhabitants use public transport and buildings are constructed in accordance with the standards of low-energy building design.

The new design goal is to realize projects and generate new urban characteristics, based on a technological maze, that "make" a new vision for the contemporary city.

It can be divided into four procedural stages.

The first stage involves analyzing the project perimeter, in particular, its relationship to the observation perimeter: morphological identification of nodes; physiological approach; territorial types; historical change. The objective of the first stage is to establish the starting position for the design task by describing in general terms the architecture of the territory, resource use and the relevant interactions of the project perimeter with the external environment. The contour of the project perimeter must generally be made congruent with political-administrative boundaries in order to ensure the comparability of recorded topographical and statistical data. In some circumstances this contour will have to be redefined.

The second stage entails identifying the network according to morphological and physiological criteria: nodes, connections and scales in network of project perimeter; morphological features; physiological features. On the basis of the results obtained in the first stage, the network elements are examined in more depth (reside, work, recover, transport).

The third stage involves the initial evaluation of the urban features, based on the five quality criteria: strengths and weakness; central idea for modelling process. The division into strengths and weakness is based on the idea of synergy, regarded as a function of network features, that generate advantages for the urban system.

In the fourth stage this evaluation serves as the basis for formulating urban development goals, and these in turn provide the basis of the designs for the urban projects that constitute the reconstruction final process (designs for the

remodelling process; projects and strategies; actions, means, milestones; actors and sponsors).

4. CONCLUSIONS.

In the run-time which from the end of the nineteenth century leads to the early decades of the twentieth century, seem to have set guidelines that guide to the current complexity of the city: the breakdown of the traditional city and its aesthetic has become a prerequisite for the creation of alternative theories of urban settlement, which is starting to understand the aesthetic of the present city under new keys, to both identify the germinative matrix of the design errors that, too often condemned some space to accommodate the qualities of a "ugly" city. It is only recently that the new urbanity has come to be associated with an additional phenomenon: cultivable land, forests, technical infrastructure, and social institutions such as schools, hospitals, factories and administrative buildings are increasingly vacant and decaying.

Fallow urban land has been accumulating, as indicative of cultural transition. Consequently, as in agriculture, cyclical urban development must lay the foundation for the use of fallow resources to preserve and enhance the quality of city life. This applies to all forms of fallow resources in the new urbanity, including landscapes, urban areas, buildings, installations, materials and human capabilities.

The latest episodes of urban transformation flow through the historic texture of our territories, and design stratified, diffuse, sometimes controlled urban areas. Currently, it seems no longer possible to talk about mechanisms of growth already acquired and determined, because the perception of a city, that lives by evolutionary known phase, is dissolving in favour of more uncertain and variable evolutionary frameworks, whose formal designs can achieve a variety of possible scenarios; we are faced with a city which prefigures several swarms of likely future frameworks, it becomes certain only through the urban design that shapes the final configuration.

Designing means thinking in advance. Without goals, we can neither reinvent nor reconstruct the city. It is possible for us to experience the construction of a whole city, or for that matter a building or a garden, but we can only grasp (and dismantle and reassemble) each as a structure consisting of individual parts. This is particularly obvious in the construction of cities, which are composed of countless, different-sized parts, which perform completely tasks at scattered locations and whose lifecycles can never be coordinated.

Reconstructing the city with the aid of a technological maze means launching, in this context, an experiment in a democratic society to ensure the survival of the contemporary city. It is defining the quality goals of a new, regionally

customized urban life. “Customization” means that every society consisting of several million people must, for instance, develop concrete ideas on where they will obtain water, food, materials and energy over the long term, without depleting regional or global resources.

We need inventions that change the urban systems of the still young cities, not only aesthetic, scientific-technical or economic inventions, but political ones in the truest sense. It must reinvent the polis, which only exists as we conceive it.

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