

## **Urban Infrastructures and the Necessity of Changing Their Definition and Planning Landscape Infrastructure; a New Concept for Urban Infrastructures in 21st Century\***

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### **Abstract**

During centuries, modern cities and societies were sustained upon technological infrastructures. Our cities depend on these networks in a way that we can't imagine them without highways or railroad networks, airports, municipal water and sewer systems, telephone, electricity and most recently internet or communication networks. Today these infrastructural networks have a vital role just the same as sun, plants and fresh air for us. These infrastructures affected our cities and our relation with our environs more than any other achievements in the industrial era.

From late 20th century by entering post-industrial era in developed countries, by the emergence of ecological hazards which led to the rise of environmental concerns since 1970s, the crises and erosion in the engineered infrastructure networks since the first decades of 21st century, beside the disability of modern technological infrastructures to response to new multi-dimensional needs of post- industrial societies, coming into focus the necessity of redefinition in the current approaches to infrastructures.

By revisiting the concept, features and crises in the field of urban infrastructures, this essay puts into question the expected aspects of post-industrial infrastructures. Also by historical- interpretation study on the notion of landscape this paper examines the capacity of landscaping approach in planning and managing infrastructures in the 21st century.

Finally, analyzing these two concepts showed that the solution to overcome the industrial infrastructures toward post-industrial one is to employ the more multi-dimensional and holistic approaches. Approaches that allow the multi-faceted integration between infrastructure and ecological, social and economical aspects of cities and point the end to the more than a century of civil engineering authority that shaped rigid and mono-dimensional infrastructures in the modern era. It noted also that the discipline of landscape which simultaneously with the great changes in modern philosophy, passed conceptual revolution, due to its inherent traits of being mediance and trajectory that is not reduced to the objectivity and mono-dimensionality, allows us to overcome the object-oriented approaches in planning urban infrastructures. Thus the result of this short recall of two notions of infrastructure and landscape shows that the utilization of landscaping approach in planning the infrastructures is one of the solutions allows us to pass the inflexibility and solidity of modern engineered infrastructures.

### **Keywords**

Infrastructure, Industrial era, Post-industrial era, Landscape, Landscape infrastructure.

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## Introduction

In more than five centuries, modern cities and societies characterized by modern infrastructures as the first results of industrialization in the 15th century. Often overlooked as background to development, these technological networks formed based on mono-dimensional and engineering modern approaches. Today, the constant failures in engineered infrastructures facing with natural phenomena and post-industrial urbanization, besides the awareness about multiple relations between human and environment that led to the emergence of new concepts such as sustainability, landscape ecology and urban ecology, in addition to the development of sciences and technology and the formation of new global and urban economies, bring into focus the necessity of redefining urban structure and their planning. In fact, urban infrastructures as a most impressive background to the development of modern cities, which are still running under the principle in industrial era, must be reviewed along with new transition in the global community after industrial era.

Recognizing the notion of infrastructure and its various aspects in relation with modern societies, prepare a context to define and design these technological networks in the post-industrial society on 21st century; a society who face with most complicated paradigms and hazards than modern purview society. This paper put into question the solution toward suitable infrastructure for multifaceted societies in post-industrial era and the relation of landscape and infrastructure in 21st century, by looking into the concept of landscape as an interdisciplinary and multidisciplinary science that was resulted of the revolution in the concept of modernity since 1900s.

## Research method

By a historical survey on the different aspects of urban infrastructures and proposed approaches in their developments since last decades, and by revisiting

the failure and crises of industrial infrastructures in the time of post- industrial, this paper put into question the expected features of infrastructure in the changing societies of post-industrial era. Besides, by a historical survey on the concept of landscape and counting its aspects and features, and by crosschecking these two concepts, this essay looking into the convention and the capacity of landscape and landscaping approach in finding a solution for post-industrial infrastructures.

## Literature review

Premier Studies on urban infrastructures was manifested during the researches on the history of technology from the second half of 20th century. In that time multidimensional role of urban infrastructures in the formation of modern society was considered in various fields of research from history to sociology, architecture, ecology and landscape architecture. The first important studies in this field was the works of Thomas Huges and Wiebe Bijker on the history of technology in which they considered the multi-dimensional role of urban infrastructures in the formation of political mechanism and social classes in 1980s. In other disciplines, publications of Martin Melosi noted the vital role of urban infrastructures in the social sanitary and the promotion of public health and David Nye and Paul N. Edwards in their studies emphasized the role of infrastructures in overcoming the nature and disseminating the modern reasons, they noted infrastructures as a contexts to distribute modern thoughts and shape modern societies. Entering the 21st century and the emergence of crises and failures in modern infrastructures to response the postindustrial society's needs, studies in the field of infrastructures were inclined to the critical approaches to modern infrastructures and looking toward a suitable solution to overcome these crises. In 21st century the studies including the works of Edward McMahon and Mark Benedict which in their studies valorized green infrastructures in front of gray infrastructures,

In 2010 Hillary Brown criticized the rigidity and mono-dimensionality of modern infrastructures in her publishes which were belonged to the industrial era. Among these, the works of Pierre Bélanger are the closest one to the topic of this paper. Bélanger (Landscape architect and the faculty member of department of landscape architecture in Harvard) questioning the possibility of utilization of new interdisciplinary and over disciplinary sciences including landscape in overcoming the engineering urban infrastructures in industrial era.

### **Hypothesis**

The landscaping approach is a suitable solution for overcoming the industrial infrastructure's rigidity and mono-dimensionality and provides a context for the emergence of multi-dimensional urban infrastructures.

### **Infrastructure**

"Infrastructure, like technology, turns out to be a recent term and promiscuous term" (Williams, 2012). Originally this term refers to the basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise. Today it has become a slippery term, often used to mean essentially any important, widely shared, human-constructed resource. In 1996-97 the U.S President's Commission on Critical Infrastructure Protection (PCCIP) chose the following functions and services as fundamental to its own definition of infrastructure: transportation, oil and gas production and storage, water supply, emergency services, government services, banking and finance, electrical power, information and communications (Edwards, 2003). As it looks, infrastructure describes all the basic man-made systems and processes which are vital for modern societies.

### **Urban Infrastructures in the Industrial Era**

Urban infrastructures in their current form are the results of modern movements and industrial

revolutions. They began with the transport network, "the first great step in improving this network, taken between the late 1600s and the early 1800s, was ambitious canal constructions which replaced rivers in and outside the cities. The heroic age of transportation tunnels opened with the advent of railroad construction in the 1830s." (William, 2008: 55-56). In that decade the railroad ceased to be an appendage of the mine and evolved into the major distribution system of the nineteenth century (Ibid). Little by little, these networks overstepped this mere role of transferring goods and materials from mines to rivers, entered the life of society and acted as distribution systems for modern culture and lifestyle in the 19th century (Fig. 1).

Meantime, water and sewer systems were vastly expanded and improved. The Paris's sewer system with its sheer scale completed between 1800 and 1870 (Ibid: 72-73); (Fig. 2). By technology developments the new infrastructural systems were emerged (Table1).

### **The awareness of the Role of infrastructures in modern society**

The infrastructural networks, upon which the industrial economy was underpinned, had a fundamental role in modern societies. Literally, from 1927 during the Great Flood in Mississippi region, the vital and multi-faceted role of these networks in the modern societies were noted. Although from the late 19s western elite, especially in USA pointed out the role of infrastructures in their civilians. For instance, Robert Louis Stevenson showed how the urban infrastructures including railroads, roads and water canals despite their raw and technocrat appearance become a mere context of people's aesthetic and romantic experiences, their ordinary life and collective memories (Williams, 2012).

From the second half of the 20th century and during the special researches on the influences of technological innovation on social evolutions in

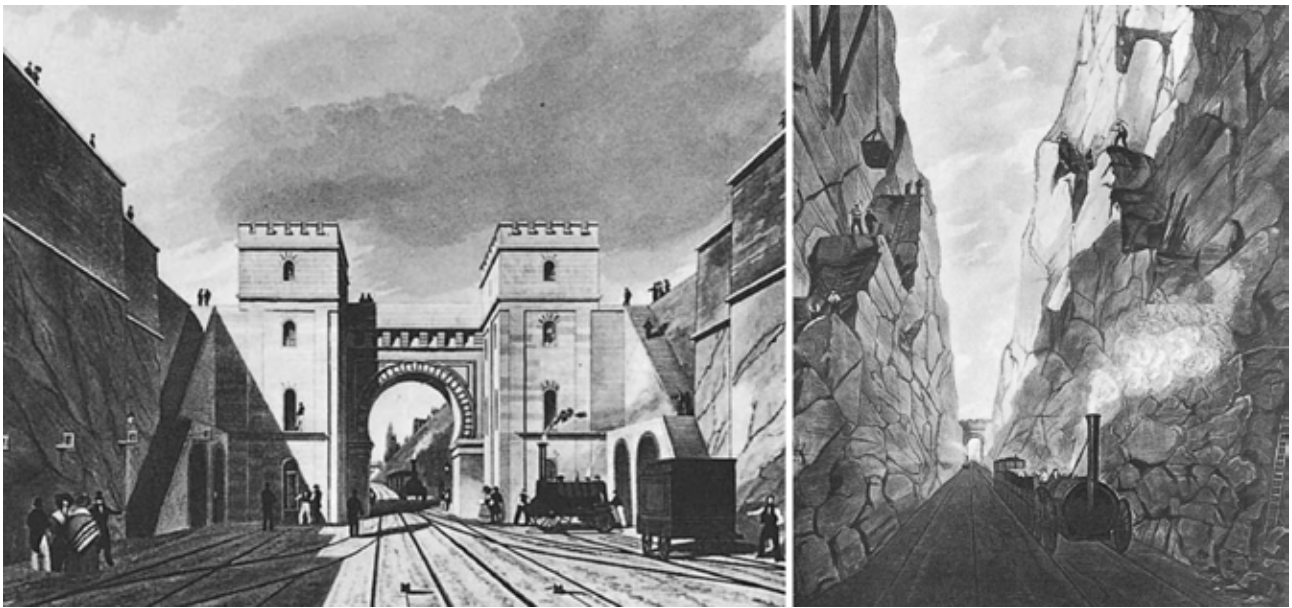


Fig. 1. Right: The Moorish arch spanning the entrance to the Edge Hill tunnel. Left: Men working on the excavation of Olive Mount, 4 miles from Liverpool, on the Liverpool and Manchester Railway. Source: Williams, 2008: 59-61.

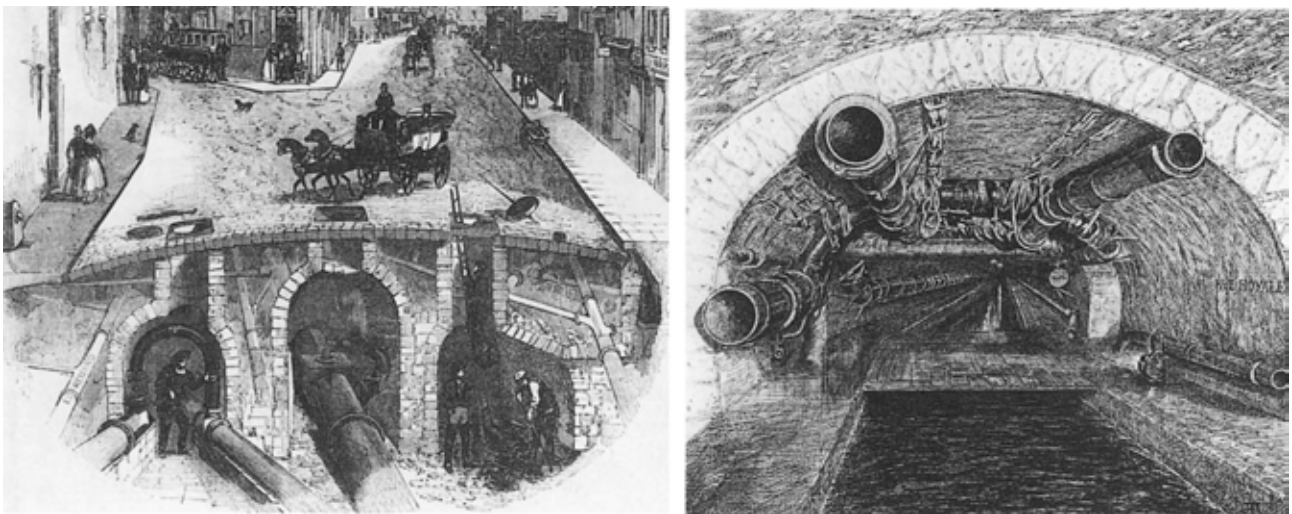


Fig. 2. In 1830 Paris had about 40 miles of sewers. Source: Williams, 2008: 72- 73.

Table1. Chronological formation of urban infrastructures in modern societies. Source: Author according to Williams, 2008 and Edwards, 2003.

	<b>INFRASTRUCTURE</b>	<b>EMERGENCE</b>
1	water canals	1600-1700  France
2	railroads	1800-1830  England
3	sewer systems	1800-1870   France
4	electricity and telephone networks	1870-1890   USA
5	cyber Infrastructure	1990-2000   USA

Europe and America, little by little a theoretical vision from the role of technical networks in the formation of modern European societies was revealed. Although the infrastructural networks were not in the center of the researches, but the studies which were mostly led by Thomas Parke Hugues or Wiebe Bijker, showed that the formation of modern capitalism, in USA and Europe, had become from the role of central government and elite in providing the communication and transportation infrastructures (Bocquet, 2006). In this way, they proofed that the modern infrastructures were not only gigantic technical systems, but social-technic phenomena (Edwards, 2003).

On the other hand, the emergence of ecological approaches led to a more-depth comprehension of the effect of long-term industrialization on the biophysics systems. Endogenous and exogenous processes, such as eutrophication, combined-sewer overflow, sediment contamination, invasive flora, exotic fauna, depleted water reserves, and seasonal floods can no longer be perceived as isolated incidents, but rather as part of large, a constructed hydrological ecology that is entirely and irreversibly connected to the process of urbanization (Del Tredici, 2006). In the last decades, with the works of Patrick Geddes, Lewis Mumford and Yan McHaurg concerning the urbanization impacts on the ecosystems, also the efforts of Martin Melonsi who considered the ecological aspects in studying infrastructural networks. Also with a social regards of ecological damages, the new movements considering the ecological and sanitary aspects in infrastructural systems were emerged. These efforts showed how the modern infrastructures affected human life in various facets in the industrial era. Therefore these modern infrastructural networks went beyond the mere technological structures and became the formation resources for society, economy, politic and the life of western societies. Thus the infrastructure is an invisible background, the substrate or support, the techno cultural\natural environment of modernity

(Edwards, 2003). In the twenty first century the new generation of infrastructures as Edwards called “cyber infrastructure” such as information infrastructures, internet networks, GPS, mobile phones are rapidly replaced the traditional infrastructures, and make a great changes in human life (Ibid).

### **Toward a new infrastructures for post- industrial era**

Since the western countries enter the post- industrial era, modern infrastructures on which the modern societies sustained for centuries were faced with significant challenges. From the late of the 20th century, at the same time with the awareness of ecological hazards due to excessive development of modern urbanizations and technical infrastructures, the disasters occurred in the infrastructural networks (Fig. 3). Besides, the inability of modern infrastructure to response the post-industrial society’s multifaceted needs raised the need to review the common approaches in the definition and development of modern infrastructures (Table2).

In the last two decades, urban ecology and technology’s experts criticized the classic definitions of infrastructures and looked into the new way of thinking in the field of infrastructures which would be more compatible with the post-industrial societies. Different ideas were proposed; one of the earliest called “green infrastructures” was raised by two planners in the field of sustainability named “Edward McMahon” and “Mark Benedict”. This new term was not a new idea, under the concept of Green Infrastructure, Benedict and McMahon emphasized the importance of the separation between the natural and artificial infrastructures in the planning and development approaches. they used the term of Green Infrastructure in opposite of Gray Infrastructures such as roads, sewers and utility lines or the Social Infrastructures including hospital, schools and prisons (Benedict & McMahon, 2002). They believe that the Infrastructures are not just modern and technologic networks, but the natural



Fig. 3. Minnesota- USA- 2007: the collapse of I-35W Mississippi River Bridge became a symbol of the debilitated state of the once- noble Interstate Highway System- and of what any critics see as America’s disinvestment in its infrastructure. Source: Brown, 2014: 2.

Table 2. Factors affecting approaches and thoughts in presenting new definitions for infrastructures in 21st century. Source: authors.

<p>Mono dimensional development in modern infrastructures caused Losses of natural areas, Fragmentation in open spaces, degrades in water resources, Decreases in ability to respond and adapt to changes in the nature, and Increases in risk of floods and natural disasters.</p>	<p>ecological and environmental crises</p>	<p>1</p>
<p>Large and small crises from failures in bridges, dams, roads, and nuclear power plants to Coastal floods, power outages, water shortages, sewage networks decay, unusual and high Maintenance expenses are the major challenges in front of urban infrastructures.</p>	<p>Failures in infrastructures in confront with new ecological and environmental complexes</p>	<p>2</p>
<p>Considering ecological issues from 1960s in different disciplines related to cities, Relies on the advances in science and technology, led to lots of Theoretical and applied efforts: from Lewis Mumford and Yan McHaurg in late 1960s to Anne Whiston Spirn, and from Schweitzer to Berquein late 1980s till 2000, which bring a new facet in relation between human and nature and in upper level between city and nature particularly in sustainability issues.</p>	<p>New scientific paradigms in the relationship between human, city and nature</p>	<p>3</p>
<p>Table 2. Factors affecting approaches and thoughts in presenting new definitions for infrastructures in 21st century. Source: authors. In late 20th century, de-industrializations in addition to urban development change the visage of post-industrial cities. In this time de-industrializations and the formation of new urban economies - such as trade deregulation, product outsourcing, automated manufacturing, biomedical research, and just-in-time delivery—based on new streams of globalizations in developed societies signal a significant structural shift in urbanization.</p>	<p>De-industrializing and the emergence of new urban and global economic methods and new ways of urbanizing</p>	<p>4</p>

networks also act as infrastructures for our societies; they supported our nations just like the other classic modern infrastructures: An inter connected network of waterways, wet- lands, woodlands, wildlife habitats and other natural areas; greenways, parks and other conservation lands; working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute to the health and quality of life for people (MacFarlane, 2007). These are the other kind of infrastructures and we must have a plan to conserve and develop them. In the first decades of the 21st century the notion “green infrastructure” gained a significant attention in both theory and policy.

In the same time, Hillary Brown considering the crisis ahead to the modern infrastructures in America, criticized the infrastructure’s rigidity and mono-functionality and moreover the way we disaggregate these infrastructures physically and jurisdictionally (Brown, 2011). In her bestseller book “next generation infrastructure: principles for post-industrial publication,” she argued that returning to the symbolic and ecological relation between natural ecosystems and utilizing the experiences of multi-functional pre-industrial infrastructures in ancient civilizations like Iran and India could led us to more sustainable infrastructures for post-industrial era (Brown, 2011; Brown, 2014).

But the one who criticized the industrial infrastructures and directly looked into the solution in the field of landscape architecture was Peter Bélanger. In his publications from 2009 by revisiting a series of milestone events in the field of infrastructures in North America, he questioned the mono functionality of modern infrastructures and the monopoly of technocratic disciplines such as civil engineering or urban planning on these vital networks. He argued that facing new urban and global economical situations and the crisis and failures in the field of infrastructures, we need to redefine our infrastructures. We need to decentralize and de-engineerize them and let the new multi-

disciplinary sciences such as landscape architecture, based on which the strategies can solve multiple challenges at once, enter the field of planning and designing the infrastructures in postindustrial era (Bélanger, 2009; Bélanger, 2010; Bélanger, 2012; Bélanger, 2016); (Table 3)

### **Infrastructures?**

As we have seen, in last decades, modern infrastructures have been criticized for their rigidity and mono functionality. The western experts, especially the Americans tried to reformulate industrial infrastructures, looked to achieve a more multifaceted and flexible one for our new situations of life in post-industrial era. The question of this article emerges here, could landscape as a new discipline proposed more multi facet and flexible way to reformulate modern infrastructure for the post-industrial societies?

The main objective of this essay is to show that landscaping approach as the holistic and multifaceted one could be a solution to go beyond the technocrat and mono-faceted approaches in planning and managing the modern infrastructure and provide the basic features of post-industrial infrastructures. But, what is Landscape and Landscaping approach based on which post-industrial infrastructures could be achieved?

### **The concept of Landscape**

Landscape as a contemporary notion which regards the relation between human and environment, directly, become from the transformation in the objective and mono-dimensional view of the classical modern human to its environs. In the European languages the term of landscape is made by adding a suffix to the “Land” and have two meanings; 1-The part of a land which nature present to the eyes of a viewer. 2- A Tableau that represents a certain area of land where nature has a main role (Videau, 1997). The notion of Landscape as we known today sometime was begun to exist from the 14th century in a same time of the Renaissance and the

Table 3. New approaches in redefining urban infrastructures in 21st century. Source: authors.

Keywords	year	Concept	Presentator
<ul style="list-style-type: none"> <li>Green infrastructures in opposite of gray and social infrastructures</li> <li>Integration and multi-functionality have a vital role.</li> <li>Green infrastructure is an integrated network from natural and artificial green spaces.</li> <li>Green infrastructure improve the values and functions of natural ecosystems and in the same time conserve the The interests of human society</li> </ul>	2002	Green Infrastructure	Edward McMahon Mark Benedict
<ul style="list-style-type: none"> <li>The utilization of sustainable technology</li> <li>Concerning symbolic and ecologic natural ecosystems</li> <li>Using the multi-functional role of pre-industrial infrastructures in ancient civilizations such as Iran, India and ...</li> </ul>	2010	Ecological Infrastructure	Hillary Brown
<ul style="list-style-type: none"> <li>de-industrializing infrastructures and decentralizing urban structures</li> <li>Being integrated and multifaceted</li> <li>The importance of entering the new inter-disciplinary and multi-disciplinary fields with holistic view to urban infrastructures and urban challenges</li> </ul>	2010	Landscape Infrastructure	Pierre Bélanger

emergence of Husserl critical comments and his phenomenological works, the relation between subject and object entered a new phase, which had a great effect on the formation of the revolutionary concept of Landscape.

Husserl, by emphasizing on intentionality proved that the perception and its dependents in the nature are not two separated existence (Idem: 13). In the 20th century, the phenomenology gave the opportunity to develop the study of the relations between human and the environments upon which the transformation of the concept of landscape was provided (Besse, 2000). Simmel in 1913 considering phenomenology, showed that the recognition of landscape depends on the transition from cultural, religious and historical contexts, based on which our interpretation of the world is formed, also consider our perception and sentiments as the main actors (Simmel, 2007).

From the second half of the 20th century, based on both phenomenology particularly phenomenology of Merleau-Ponty and the achievements in biophysics and other cognitive sciences, the world of perceptions and interaction between human and environment

was recognized (Berque, 1995: 25-27). According to these achievements, Agustin Berque in the last decades of 20th century introduced landscape more in a relation with the view of human that in the object he looks at. For him the way to percept landscape pass through the cognition of our sensory organs. By analyzing the structure of visual perception he shows that this perception is not limited to the sense, but we know objects that surrounded us by deduction, it means the objects were resulted from the connection between visual data and collection of data related to our historical, biological and cultural memory (Berque, 1995). In Berque's point of view, the landscape is indeed a collection of human relations with ecoumen, he noted that from the median and mutual relation between two facets of our existence; first, our individual animal body and second our mentality (Eco technical-symbolic system) landscape emerges. This relation is not separated to the visual data in one part and mental images in other, but objectivity and subjectivity integrated in a one smart structure which is both ecologically and symbolic in a same time: Eco symbolic (Berque, 2013: 67 &



beginning of the modern era in Europe. Historically, it is the result of modern's distinction between the world of physique and the world of phenomena (Berque, 1995: 103-104 & Berque 2013: 2). In fact, the Cartesian cogito which is considered as an ontological base for modern, and propose the unlimited and absolute modern subject, is the first step in the birth of the landscape. The exact time when the modern human started to tear away from the unitary feeling of the whole of nature and individualize the nature, landscape was started within the realities of nature (Berque, 1995:141; Simmel, 2007).

As we seen, landscape was born by questioning about the relation of subject and object by the birth of modern subject. In this meaning landscape is the example of the great division between human and universe, object and subject and nature and culture which were established by modern absolute reason. The scientific revolution which was started with the distinction between objective and subjective worlds and led to the birth of Landscape, allowed modern human to be the master and the lord of nature. This caused the dramatic degradation and loss of landscape in the modern industrial cities due to that the romantic approaches to the nature were emerged in the 18th century (Berque, 1995: 109). At that time the romantic approach meant a complex structure of spirit in cooperation with active process of looking and perception of the world (Conan, 1992) and the concept of landscape evaluated to phenomena which represent the perception of the subject. It will not be any more the object of a logical and rational representation because it is also a place for a sensitive experience. Landscape, from a distance, establish a new relation between human and world which is not any more symbolic or analogical, but aesthetic and aesthesis (Collot, 2011: 59).

The late 19th century was the time when the grand philosophical systems which were formed based on reason and experience, and emphasised on the separation between subject (human) and object (world), collapsed (Dartigues, 2005: 11). With the

Berque, 2000). Berque also, based on the Watsuji's theses, Japanese phenomenologist influenced by Heidegger, pointed out that this relation between the world of physics and the world of phenomena and this interaction between inside and outside not only depends on visual perception, but also depends on the relation between human societies and their environment. As Berque showed in this meaning, landscape is a stream of relationship based on which subjects and objects integrated in a sustainable way; a trajectory; a mutual relationship and a physical and cultural interchange between human and his places. At this point of view landscape is evaluated to a mediator between the world of objects and subjects. The Landscape is nothing but a mediance which is physical and phenomenal, ecological and symbolic, related to reality and sensibility (Berque, 1995: 35-37 & Berque, 2014). Berque considers landscape as an individual and collective interpretation of a place in its historical and cultural context.

Since this experience of landscape manifest, our sensible relation with the world will not be that peaceful subject in front of object, but a junction and a permanent interaction between inside and outside, me and others.... This exchange between exterior and interior not only concern the individual perception, but also lead to a new relation of human societies and their environs. Landscape transform to a flux relation, as Berque aware of Watsuji's thesis called "mediance", which lien subjects to objects and societies to space and nature; an integration between human, nature, history and place (Collot, 2011: 28 & Berque, 2010). In this notion from the late 20th century Landscape was freed from all dual constraints and became a transmission space; a complete example of multidimensionality of human and social phenomena in postindustrial era.

### **Landscape; A response to release of object-oriented approaches in the relation of human and environment.**

The promotion of landscape to the mediance

between subject and object in the 20th century was a great achievement based on which landscape as a philosophical concept became a solution to across the modern positivism rigidity ruled the relation between human and environment. Landscape as a mediance shaped the concept of ecoumen, because of its facultative, is one of the keys allows us to find a goal solution for the crises of mono-dimensional approaches for planning and managing spaces. It allows us to find suitable criteria which have a potential to understand the current complexity of the world. In the last century the modern positivism and correlatively technocratic functionalism, evaluate the risk of solipsism juxtaposition in spaces; remain from modern utopia (Berque, 1995: 165-171). At Bernard Lassus point of view, the object-oriented and mono-dimensional view of modern caused the inability of current disciplines in urban planning such as architecture and urbanism to solve the problems of our time.” The first one fundamentally oriented on the object, and the other asphyxiated by environmental, technical and security constraints... landscape by its less linear and more transversal approach, should be the [suitable] discipline ...”(Lassus, 2013).

### **Relation between landscape and infrastructure in the post-industrial era**

As considered in the notion and features of urban infrastructures in both industrial and post-industrial eras, the urban infrastructures in their current situation are the result of the industrial revolution and the modern era. They are the networks based on modern technology, which reciprocally provided a formation and development context of modern society. In the 21st century, facing with environmental hazards and failures in modern technological infrastructures, besides the emergence of new paradigms in the global society of the postindustrial era and disability of technocratic modern infrastructures to answer these challenges, the importance of defining new approaches to infrastructures was revealed. At this time, the rigidity and mono-dimensionality of modern

infrastructures also their solidarity was criticized, and redefining urban infrastructures as a multi-layer and multi-functional infrastructure base on ecology and sustainable natural-friendly technologies, was considered. The suggested solutions emphasized that new infrastructures must be transformed from a phenomena with a service role to a phenomena with an active role in the life, human societies; they must be promoted from mono-dimensional phenomena to multi-dimensional one. Finally the involved factors in the infrastructure construction must be transformed from sole purview professions such as engineers to other professions with a more holistic view such as artists, socialists and landscape architects, the one who consider various aspects of the environment in his planning and designing. Thus the way to overcome crises in the field of infrastructures passes through the de-engineering and putting aside the rigid and mono-dimensional approaches based on which the modern infrastructures developed during 5 centuries.

In order to find a comprehensive solution and to prove that landscaping approach will answer the new needs in the field of postindustrial infrastructures, this essay counts the meaning and the aspects of Landscape as a new approach to redefine the relation between human and environment and examines the ability of landscaping approach to define new post-industrial infrastructures by drawing a cross-section between these two concepts.

Historical review of the notion of landscape showed that although the notion of landscape emerged by questioning from the relation between subject and object in the same time when absolute modern subject was manifested. But simultaneously with the resurrection in the concept of classic modern and its absolute subject, the notion of landscape fundamentally changed during the last century. By rejecting the dualism between subject and object, Landscape exceeded the objective- oriented and logical analysis of components which have formed it, and reached a compound recognition of the relations

integrated these components. Landscape become a mediance, a mutual relation between interior and exterior, subject and object, society and environment which is not to deduct to a subject or object of modern positivism. In this meaning, the landscape is one the rare concepts rejects the modern separation between

object and subject, the basic reason of rigidity and objectivity in modern sciences, become a mediance between subject and object. Thus, it allows us to find a global solution to overcome mono-dimensionality crisis in planning and managing spaces.

### Conclusion

This brief survey on the concepts of infrastructures and landscape in our changing world showed that:

1- Urban infrastructures as a part of our environs, shaped the human environment and in a particular way his perception of the environment. The domination of mono-dimensional (and technocratic) approaches in planning and managing infrastructures caused their failure and crisis in response the post-industrial society needs. The solution to overcome this crisis in the field of infrastructures is to adopt more multi-dimensional approaches in front of urban infrastructures.

2- On the other hand, Landscape is a new and revolutionary approach in the relation between human and environment. Landscape as a mediance and an objective- subjective phenomena is one of the concepts allows to overcome the dualism between subject and therefor is the solution, allows us to pass the positivist and mono-dimensional approaches in the field of planning and managing environment.

Thus, by drawing a cross-section between two notions of infrastructure and landscape the relation between them is revealed: As mentioned before “the solution to overcome the crises in the field of infrastructure is to pass over mono-dimensionality “and “landscape as a discipline and approach, because of its multidimensionality and being objective and subjective in a same time allows us to overcome the mono-dimensionality crises in facing with environment”. According to these two propositions and since infrastructure is a subset of the human environment: Landscape and Landscaping approach could be a suitable solution to overcome mono-dimensionality in redefining urban infrastructures (Table 4).

Table 4. Relation between two notions of Landscape and Infrastructure. Source: authors.

<b>Landscape</b>	<b>infrastructure</b>
<p>Landscape is a mutual relation and mediance between subject (human mentality) and object (environment and nature), it is the result of interaction between history and geography, nature and culture, ecology and symbol, human and society and is not reducible to the mere subject or object.</p>	<p>In modern world, infrastructures shop our environment and we could not percept universe moreover they allow us.</p>
<p>Recovering from current technocratic and positivism approaches is the most important issue in planning and managing the relation between human and environment, and landscape is the suitable discipline.</p>	<p>Rigid and mono dimensional infrastructures could not response the multidimensional needs in post-industrial societies   redefining the technocratic and engineerlized approaches in modern infrastructures is necessary in our changing world.</p>
<p>The notion of landscape, as a mediance formed ecoumen (because of its trajectionality and being objective- subjective phenomena) is one of the keys allows us to find a goal solution for the crises of mono-dimensional approaches in planning and managing spaces.</p>	<p>It must be overpassing the positivism and object oriented approaches in planning and managing infrastructures toward multi-dimensional solutions in the field of urban infrastructures.</p>

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