THE REPUBLIC OF TURKEY
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WATERFRONT DEVOLOPMENTS: A CRITICAL ANALYSIS

M.S. Thesis

ALİ BERK PİLGİR

ISTANBUL, 2012

THE REPUBLIC OF TURKEY
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THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

ARCHITECTURE

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ABSTRACT

WATERFRONT DEVELOPMENTS: A CRITICAL ANALYSIS

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Architecture Master Program
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The purpose of this study is to clarify the advances in waterfront developments and their effects on the cities. The waterfronts became the nodal points of the cities, even though they were just the boundaries at first. This kind of progress was possible, because waterfronts gather the advantages of water and land mediums, which results in dynamic spaces. This dynamic space effect on waterfronts made them evolve themselves through being as the status of gates into port cities. But after the Industrial Revolution these dynamic spaces turned into mono-functional bases for profit purposes. Accordingly through the years they were cut off from the the cities and became abandoned spaces. Around 1950's the re-development projects made the dynamism come back to the waterfronts by converting them into multi-functional public spaces. But in the recent years the usual re-developments were not enough accordingly there is a rise to sustainable approach. In this thesis, based on waterfront development literature and empirical observations; Baltimore Inner Harbor, Barcelona Port Vell and Shanghai Expo 2010 have been analyzed through their connections between the waterfronts and the cities critically, and commented about the results of different approaches and how sustainable these solutions are.

Keywords: Waterfront Developments, Port Cities, Baltimore Inner Harbor, Barcelona Port Vell, Shanghai Expo 2010, Sustainable Approach

ÖZET

KIYI YERLEŞELERİNDEKİ GELİŞİMLER: BİR ELEŞTİREL ANALİZ

Ali Berk Pilgir

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Bu çalışmanın amacı, kıyı yerleşkelerindeki gelişmeleri ve bunların şehirler üzerinde olan etkilerini açıklamaktır. Başlangıçta, kıyı yerleşkeleri sadece bir sınırdan ibaret olmalarına rağmen, zaman içinde şehirlerin düğüm noktaları haline gelmişlerdir. Böyle bir gelişim, kıyı yerleşkelerinin su ve kara ortamlarının avantajlarını kendi bünyelerinde topladıkları ve dinamik bir alan yarattıkları için mümkün olabilmiştir. Kıyı yerleşkelerinde görülen bu dinamik alanlar, onların geçit durumundan kıyı şehirlerine evrimleşmesini sağlamıştır. Fakat Endüstri Devriminden sonra bu dinamik alanlar kar amaçlı olarak tek işlevli alanlar haline dönüşmüştür. Buna bağlı olarak şehirlerden kopmuş ve terk edilmiş alanlar haline gelmişlerdir. 1950'lerdeki yeniden gelişim projeleri, kıyı yerleşkelerini çok fonksiyonlu alanlar haline getirerek dinamizmin bu alanlara yeniden dönmesini sağlamıştır. Fakat yakın zamanlarda bu alışılagelmiş yenileme projeleri yetersiz kalmış ve sürdürülebilir mimarlık yükselişe geçmiştir. Kıyı yerleşkelerinin gelişim literatürüne ve deneysel gözlemlere dayalı olarak, Baltimore Inner Harbor, Barcelona Port Vell, Shanghai Expo 2010; kıyı yerleşkeleri ve şehir bağlantıları bağlamında eleştirel olarak analiz edilmiş, farklı yaklaşımların sonuçları ve bunların ne kadar sürdürülebilir oldukları tartışılmıştır.

Anahtar Kelimeler: Kıyı Yerleşkelerindeki Gelişmeler, Kıyı Şehirleri, Baltimore Inner Harbor, Barcelona Port Vell, Shanghai Expo 2010, Sürdürülebilir Yaklaşım

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1. INTRODUCTION

Water is the source of life that has both controlled and yet provided for human existence and all flora and fauna on earth. As the science has proven what starts in the rainforests and flows into the rivers of the world is the water itself. It exudes a magic that no other element possesses. It is this artery that, while sustaining life, creates a unique environment and way of life on banks. From the river to the lake, from the estuary to the ocean the interaction of man and these banks have been the basis of a special relationship, one often characterized by potential danger but also by abundant rewards. The improvement of this special relationship leaded to develop the port cities. The cosmopolitan richness and diversity of the world's port cities results from the desire to live at the edge despite impending weather crises and the other catastrophes.

The ports are the nodal points in the waterfront, which also create a big dynamism between the water and the land mediums. Compiling the advantages of these two mediums, waterfronts became an important space, which made the people prefer to build cities on along the history. Initially, the sea, lake or a river was used as food supply that serves more than land, also provides easy transportation, which created the first real phase of waterfront development.

At the beginning ports gave the ability to strengthen the sailing, water transportation, and developing their cities. For example before the invention of the wheel, the Egyptians were able to build cities and monuments of colossal size by ferrying materials down river on barges.

In history, most of the big cities were built along the waterline. By the time the commercial era has begun and waterfront cities became the centers for trade, the ports evolved into port cities, which also brought the definition and necessity of hinterland. As the port cities have to be connected to logistics and residential spaces that were gathered in hinterlands.

Istanbul, Izmir, London, Barcelona are some of the examples that also represent the main gates, which connects the transportation lines to the hinterlands of the cities. By representing the status of serving as gates; waterfronts, which were actually the natural border itself, started to become unifying space of the cities. By interacting in a positive way, the basic port settlements had improved their relationship with transportation, trade, and seafaring, then they became port cities and cause the development of the hinterlands, which were the new generated spaces that could serve as the residential, transportation, and trade centers of their regions through out time in that order until the Industrial Revolution.

As a contrast after the Industrial Revolution, some of the waterfronts like Manchester's, started to be used for serving as a mono-functional bases that were mostly used as shipyards or hinterlands rather than "unifying space" to achieve some commercial profits. As a result, through the time the old waterfronts turned into concrete ruins, which started to become a part like the city slums. These ruins affected the natural life in a negative way and were abandoned when the commercial usage was over or still suffering (Maw 2011).

In 1918, according to Remesar (2004)[1], after the promenade law for waterfronts was legislated, some of the waterfronts kept on developing for recreation services of the cities, becoming more and more popular with their water related activities or the harbor life styles (Remesar 2002).

In the second half of 20th Century, the importance of the waterfronts, which was more than just being a "simple" parts of cities that don't have facilities, was realized again. It has been considered they are not the spaces that serve just for commercial, but also for the recreational activities of the city. This is one of the most important reasons why the waterfronts are the unique locations that artificial and natural elements come together in

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[1] According to other researcher there had been other recreational waterfronts serving just for the high-class society before 1918. But the according to Remesar (2004), the recreational waterfronts as we know, were developed after this law was legislated.

such harmony, which also made the reshaping projects of waterfronts being included to "Urban Renewal Projects". Because an abandoned port, concrete ruin or a physical detrited space by the edge of the water should not be considered as recreational spaces for the city that is about to lose its heritage, and become a non-functioning waterfront.

On the other hand, contemporary approach in waterfront design tries to wipe out those mistakes of the past. Early solution was to create waterfronts that should be more attractive than their original, and for making the attractions possible, some facilities, which would keep the heritage that was inhabited there for generations, had to be included into the projects. Considering that keeping or re-functioning these industrial structures, transportation docks or wharfs, which had become a part of city's heritage, would represent a better legacy.

The real solution came in recent years, using the nature as a shelter makes everything easier and more efficient. Combining this thought with the technological developments are considered as the cure for consuming places and had also created new trends for the waterfronts. Even though there had been some unrelated approaches, the important improvement is articulated with the sustainability and preserving the heritage that the city had.

The next step is just about to come for waterfronts, to be totally designed in sustainable approach and be in a harmony with the nature that surrounds it. This long term processes can only work if the authorities take the control and focus on facilitating, because new city-port challenge can only be useful if it's considered as its for the entire nation rather than just the city (Bruttomesso 2006, p. 26).

The waterfront development projects examined in this thesis were the most prominent examples of physical planning in 16th century, and urban renewal projects in 1940's, 1970's, 1980's, 1990's, 2010 (Thierry 2010; Breen and Rigby 1993; 1991; Bruttomesso 1993, 1991; Hall 1991; Konvitz 1978). Most waterfront development analysis benefit from a multi-disciplinary perspective. The impetus of the development began in 16th

Century when the progresses in Ideal City Planning advanced and made the port cities evolve (Konvitz 1978). But the change of evolving process began in 1960's when technological advances in the shipping industry made older port facilities being abandoned (Pinder and Hoyle 1992; Herschman 1988). In this thesis the evolving process of the waterfronts will be explained beginning from establishment of early port city settlements up to 2010 Shanghai Expo 2010.

From past to present the advances in technology, seafaring, transportation needs caused waterfronts to have different characteristics and turn themselves from the unifying spaces into detrited or abandoned spaces. For the last few decades the importance of these assets has been re-discovered and alternative solutions to industrial zones or to abandoned spaces have been produces. In this thesis, the advances in waterfront developments focusing on spaces by the waterfront, their efficiency/effectiveness and how sustainable the solutions are, will be analyzed critically, using case studies in a perspective of an architect. The focus will be on Baltimore-Inner Harbor, Barcelona-Port Vell and Shanghai Expo 2010.

1.1 Scope of the study:

This study tests the relationship between the waterfronts and the cities by using critical analysis of the prominent examples of urban renewal projects that has transformed their cities most. In order to be effective it focuses on the relationship of the spaces in the waterfronts and their effects over each other and the cities. The goal is to clarify the differences in the advances of waterfront developments by using the perspective of an architect but focusing on urban and waterfront planning. Limiting the scope of the study is not intended to ignore or dismiss the other relevant, inter-related, and intriguing aspects of waterfront designs.

The chosen locations specs and comparative analysis framework and procedures used in the study. Ultimately the process developed in this study can be generalized and applied in other contexts.

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1.2 Methodology:

This study was conducted between Januarys 2011- 2012. The comparative analysis includes data and information collected from the books, thesis, reports, case studies, journals and architectural magazines. The thesis focuses on the projects that have been examined in different reports or books. Acknowledging that architectural perspectives are inter-connected with social, environmental and urban planning perspectives, this thesis focuses strictly on portion of the city scale that has been affected by the waterfront development.

The thesis writing was primarily based on information publicly released. Media reports, academic papers and internet research were used to compare and contrast with official data for cross analysis. Multiple photo observation studies were conducted.

The project has used the following methodology:

1. The initial investigative/case-study phase focuses on determining, comparing, and clarifying the factors that have defined the relationships between the port city developments and their effect over the city and the people.
Studies show that there are distinct preferences in the waterfront development approaches. For example, in Europe it was demanded to create compact spaces, but in US it is the opposite. According to Remesar (2004) there had been different trends even for the same territories during the timeline.

2. Critical analysis includes three selected waterfront developments from different time lines, but also related. For example Baltimore Inner Harbor was built in late 1960's, even though first phase of Barcelona Port Vell redevelopment was finished in 1992, it was inspired by Baltimore Inner Harbor. But as a contrast Shanghai Expo 2010 had a different approach than the others, even though there is not a huge time difference between the construction dates of Barcelona Port Vell and Shanghai Expo 2010.

This comparative study shows that the differences in the approaches, their effects over the city and the way that the advances in waterfront development should be on in the future.

2. HISTORY OF CITY & WATERFRONT DEVELOPMENTS

During the period of waterfronts' development, they have had lots of meanings, they were the natural borders at the beginning then they became ports, when the first basic relationship between water and the settlements were established. This basic relationship affected the people so much that they started to build their cities by the water, even though they knew the negative effects. The unified space between the new established city and the waterfront created the status of gate, which made the waterfronts more valuable. After awhile these newly established cities turned into port cities and then created their hinterlands, which had taken a couple of millenniums. But especially since the 19th century things started to change faster than it was.

There are two main triggers, which has increased the evolving speed. The first one is Industrial Revolution and the second one is the demand of the people for recreational spaces. After the industrial revolution, construction ability increased and duration decreased; so waterfronts, which have economic advantages, became the targets.

Table 2.1: Developments of Port Cities

STAGE	SYMBOL ○ City ● Port	PERIOD	CHARACTERISTICS
I Primitive port/city	○●	Ancient/medieval to 19th century	Close spatial and functional association between city and port.
II Expanding port/city	○----●	19th - early 20th century	Rapid commercial/industrial growth forces port to develop beyond city confines, with linear quays and break-bulk industries
III Modern industrial port/city	○----●	mid - 20th century	Industrial growth (especially oil refining) and introduction of containers/ro-ro require separation/space.
IV Retreat from the waterfront	○ ●	1960 s - 1980 s	Changes in maritime technology induce growth of separate maritime industrial development areas.
V Redevelopment of waterfront	○ ●	1970 s - 1990 s	Large-scale modern port consumes large areas of land/water space; urban renewal of original core.
VI Renewal of port/city links	○----●	1980 s - 2000+	Globalization and intermodalism transform port roles; port-city associations renewed; urban redevelopment enhances port-city integration.

Source: Hoyle, B.S. & Knowles, R.D., 1998. *Modern transport geography.* 2. New York: John Wiley & Sons. p.47

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As it can be seen in Table-2.1, the advances in port developments were shown. The development of the major port-city concept has been the evolving relationship between a port and its urban environment. In the second half of the last century, it's for sure that the ports and their cities became really different from the past and became more part of globalization. During this period many of the historically significant ports lost their attractions, while the others developed themselves with differing effects for their urban environments.

Since the beginning of the 20th Century most waterfronts were modified for serving just as a port; the railroads cut the connections off the city. So in a few decades of time right after the potential of profit decreased, they turned into abandoned spaces, which had already been forgotten even by its own citizens.

In the last three decades, major waterfront development has been arising, as the public had demanded its ports back. Rehabilitation has affected all around the world, based on desire to work, play, and to live at the water's edge. Boston, Baltimore, Seattle, San Francisco are the original innovators of this reshaping process which started in late 70's have shown the way to the other cities. It wasn't just the local who supported this renovation for waterfronts; the millions of tourists had also supported, and provided the basis for a new positive economic impact on the community. But this waterfront rebirth has gone even further in use and scale than original models.

Figure2.1: Chios Illustration
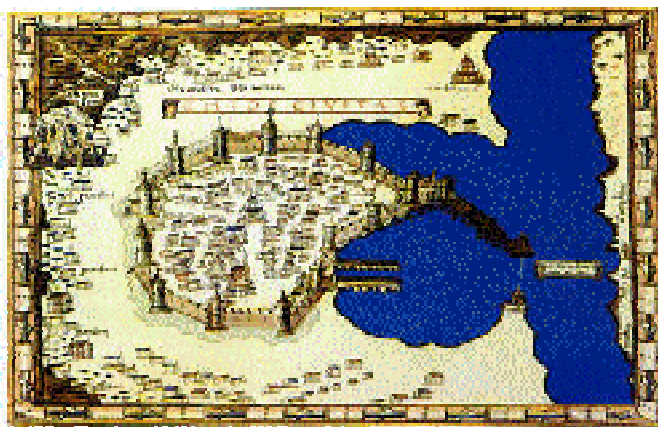
Source: http://www.chios.gr/History/Pix/grav2.gif [2011]

On the other hand, throughout history it's been thought that the port settlements are the beginning of effective water-land relation; it's unknown which century B.C. they started to be build. In these settlements as much as it's been understood from the pictures, focus is more on the social interaction and wharfs, which also contained the ports.

According to Remesar (2002 p.3), Plato said; "Build the city ten miles away from the sea" to prevent its moldy, salty breezes. It means; if it's not source of fresh water like a river, creek or a lake, early settlements preferred to build the city itself away from the ports, but also for gathering or transferring goods they needed ports and warehouses, which were apart from the cities.

If it's been connected to a creek like ancient city of Chios, they were able to build a city next to water without being negatively affected, but they still left the port outside of the city for protecting themselves from the attacks that can come by the water, which made them to build huge walls between the city and the water and isolate the ports.

As refined versions of the sailing vessels ventured farther in pursuit of trade, specialization and adaption continued to expand and to improve on the form of transportation, leading to great port cities that developed, for recreation, trade, and protection in the Roman and Greek periods. Protection of the ports was vital due to the fact that one of the most effective ways for an invader to attack was nemeses by the water as thousands of troops could be delivered quickly to the victim's door, weather permitting. Since the port settlement was located a substantial distance from the major city, it would take the enemy a day's march after arriving on shore before it could prepare an attack, offering protection for the victims (Remesar 2004, pp.4-5).

Figure 2.2: City of Mycenae Illustration
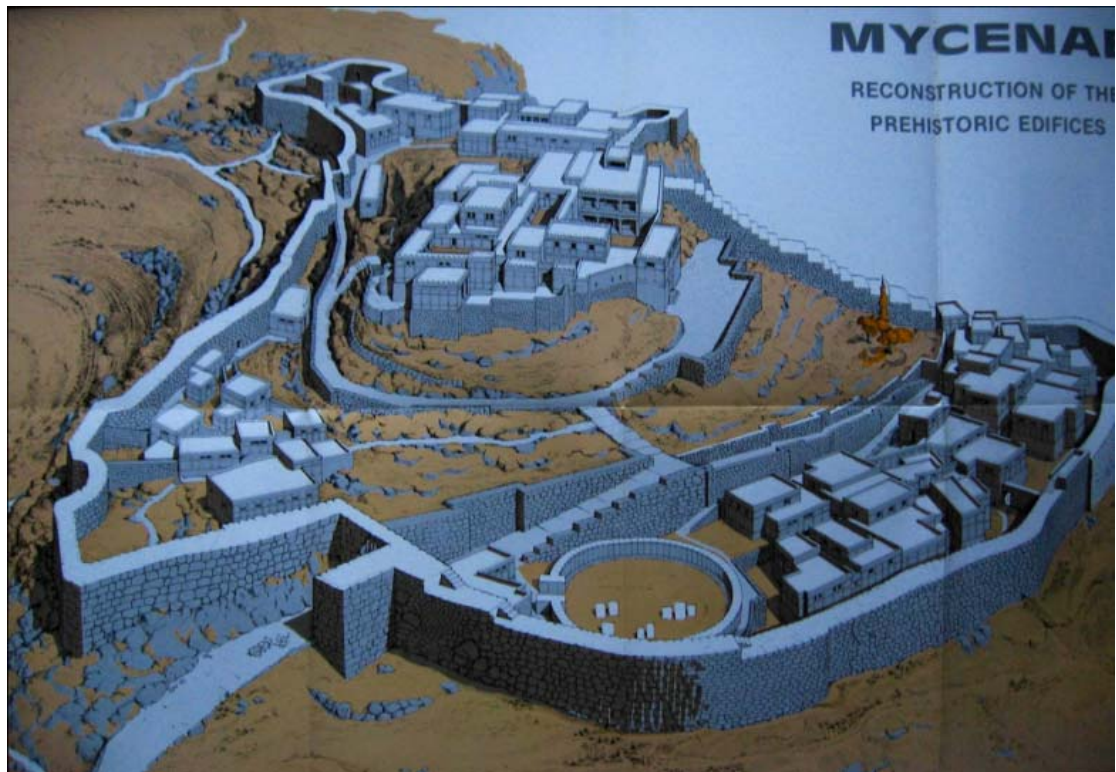
Source:http://mappery.com/maps/Ancient-Mycenae-Map.jpg [2011]

Mycenae is one of the known oldest port settlements in Europe around 2000 B.C, in a time that the insecurity was increasing, so it's natural that it was surrounded by huge walls.

Even though as it was mentioned above, for preventing its moldy, salty breezes, cities should be built away from seas, according to Tomlinson (1992) this settlement was build next to Aegean Sea. The small villages which were dealing with farming, were connected as extensions that means the settlers were also busy with the transportation, trade or fishing along with agriculture and they didn't care about the negative effects of the sea.

Figure 2.3: Interaction on Waterfronts

According to the pictures the ancient ports and the cities have basic but strong relationships even though the ports were left outside of the city walls. This strong relationship, which also created the unifying space rather than just the border, made the settlers build their cities by the sea. This basic relationship continued and improved itself until the end of dark ages.

2.1 BEGINNINGS OF PLANNED WATERFRONT DESIGN

In ancient Greek Empire, medieval France, England, and America; it's been thought that if they simplify their tasks into reduced number of different project models, they would achieve better results. But the consequences were the towns, which were looking alike.

In sixteenth century, the balance of political, social ideas and graphic terms created the idea of "Ideal City". This balance gave the planners to create something like complete unit, containing harbor, river or canal. On the other hand, the practical planning gave them the ability to design something that doesn't look alike, because the design was going to be made specific for that geographical site by preserving the characteristics, historic forms of port cities, in which harbors, rivers or canals were related to the rest of the city.

Additional to the ideal city planning, of the sixteenth century, there was an evolving process resulting in "Maritime Culture". It's based on expressing the sea power as if military and technology of seafaring and advantages gained from it. This approach was used mostly by the northern Europeans, who have found out the importance of the sea power (Konvitz 1978, pp. 1-23).

2.1.1 Ideal City Planning

The source of ideal city planning comes from the rediscovery of excellence in human scale and the efforts to apply this excellence to city scale. For this reason, every structure had to be coordinated and integrated to human's social nature for the purposes of creating the perfect society, which actually never existed. According to Konvitz (1978, pp. 7-9), if the maritime culture is examined, it's clear to see that it made ideal city function for the same perfect and non existing society, so ideal city remained as utopia and created problems like lack of imagination, for early ideal city planners. The forms that the cities were shaped in, without important aspects of port cities and they way they function were taken into consideration (Windsor-Liscombe 2006).

In the 15th Century, when Seville became the metropolitan capital of the Spanish Empire, the importance of the waterfronts was noticed. The entire small fleets could find a shelter on its rivers, ample supplies and distribute goods to the facilities for import-export trade. After the harbor was constructed, the merchants in Seville became brokers, because they were distributing the goods that were coming from America to Europe, and collecting the exports from Europe for distributing across the ocean. This situation caused Ideal City Planning being affected by the Maritime Culture in order to expand the trading (Konvitz 1978, pp.17-18).

Maritime Culture had great effects over functions of the city, and ideal city planners were trying to create a connection between the cities of the sixteenth century, but by the reasons of expansion, there wasn't any balance left between the trade and the traffic. In the seventeenth century, city development and the forms changed through the effect of

the maritime culture. They expanded the facilities, which were serving for trade, canals, traffic streets, quays and the rest of the city.

The project "Nieu Stadt" in Antwerp is one of the early urban projects that use older town extensions, and create a formula that would lead the way for the cities in Netherlands, America and Europe for one and a half century (Konvitz 1978, p.21).

When Simon Stevin's grid plan had added a new perspective to the port city of Antwerp, separated the private affairs from the public, unlike the elaboration in Italian port cities. This design principle encouraged the variety of functions like schools, asylums, residences, and place for merchants and the canals, traffic patterns just supported this idea, which expressed all the functions should be treated in an equal value, bounded the whole city (Konvitz 1978, p.21).

In this grid system, any kind of facilities are located as equal in path of distance, and had two centers which allowed the Stevin to separate the more accessible public spaces and the private, without sacrificing the supremacy of the former over the latter.

According to the spatial organizations; the buildings, streets and topographic features had to be in an order to derive economic, social and political values. These values decided where the new waterfront or the extension of an existing waterfront would be located. Working on these values gave the designer so many varieties.

The biggest difference between "Ideal City" and "Practical City" can be seen in the city growth. The problem of the ideal city was; it had focused on making the waterfront as a fixed element in a complex, usually geometrical design, which did not allow for any kind of growth. On the other hand using the existing patterns weren't helping either, because the economic and social lives that were supposed to be articulated with the waterfront was not clear. Therefore, the practical planners focused on spatial design to sustain and promote the growth of the city.

The result was to build the city around the waterfront, so it will eventually become a part of the bigger design and determined the important aspects of the maritime culture, which was really efficient in seventeenth century. The diverse variety of the models depending on progress of the experienced Europe made the 17th Century different from the others.

In the Ideal City Planning utopia there were such borders, which made clear where everything was belonging, but other than that there wasn't any specific land-use control to unify the city (Konvitz 1978, pp.13-19).

In section 2.1.3 Antwerp was given as an example, because it was affected by both Ideal City planning and Maritime Culture.

2.1.2 Maritime Culture

The early projects that had taken place in Western Europe, express the idea of port use as the necessities of the city rather than the social, so the focus was on developing the port-infrastructure. Even though the period of time, which starts at Middle Ages and goes up to the 19th century, is early for such an improvement, the natural artifacts such as bays, creeks made it possible.

Figure 2.4: Antwerp Plan in 19th Century
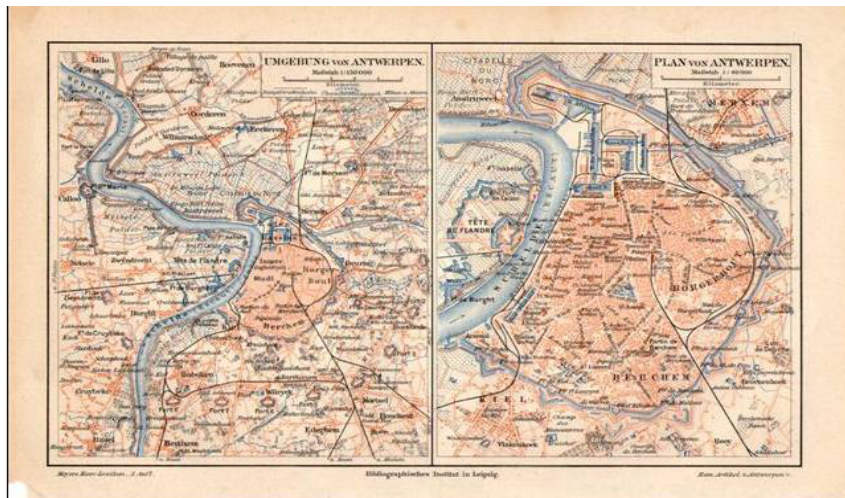
*Source:*http://images-01.delcampe-static.net/img_large/auction/000/105/348/378_001.jpg?v=1[2011]

The infrastructure of the port was actually transformed from the landscape, which was also containing the drainage systems. These port-infrastructures in cities such as Amsterdam, Rotterdam, Dordrecht, Vlissingen, Hoorn, Harlingen, were also used as main structures of the urban fabric. According to Konvitz (1978, pp.21-32), what Stevin planted into the city design was the holistic design that had been implanted into ideal city planning in order to emphases the introducing of social changes through urban form.

By the time harbors were being installed with infrastructures, cities started to develop at the immediate border of the harbor, which was the nodal point for transportation routes. In seventeenth century, the port cities like Paris, Amsterdam, and Copenhagen started to be modified for expressing the sea power that came along with the maritime culture, but the successful procedure of those three was Amsterdam, because Amsterdam had municipal authority over the land use and over construction methods.

After sixteenth century they could extend the limits of Amsterdam up to three times across the vacant land beyond Singel, Antwerp. This planning was named as ''Plan of Three Rings''. The main achievement of this extension was; this plan provided accessible, familiar waterways, which made the people of Amsterdam to develop a sense of play about their fabricated natural environment, and made them enjoy the

waterfront by adding aesthetic enchantments in the city's architecture. By the time this improvement was taking place in Amsterdam and creating the basis for recreational waterfronts, no one thought visiting the seashore for pleasure (Konvitz 1978, pp.21-23).

2.1.3   The Case of Antwerp:

Figure 2.5: Plan of Antwerp
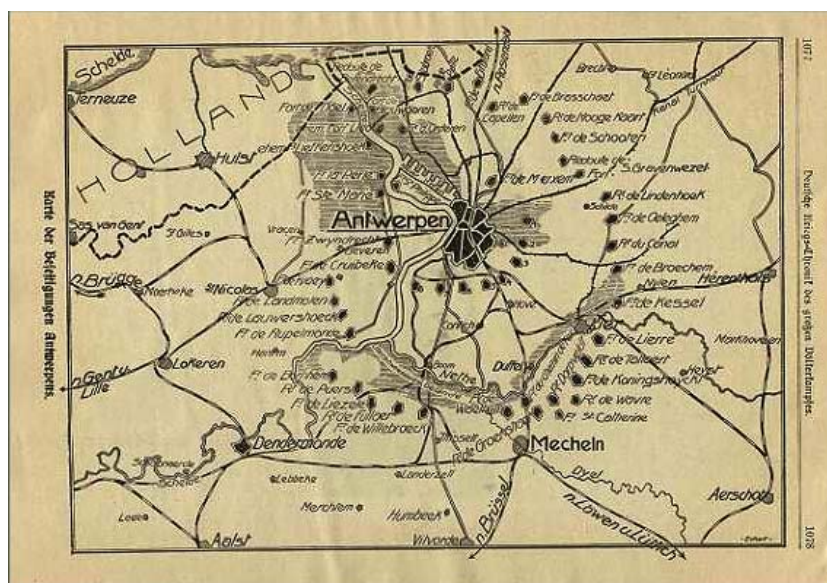
Source: http://www.greatwardifferent.com/Great_War/Surgeon_in_Belgium/D%20Kriegschronik%20-%20Antwerp%201077.jpg [2011]

At the beginning of the 17th century, the developments in military and sea power supported the idea of ideal city planning, which suited as alternative for exploiting the sea. But in larger scale mastery over the sea had not provoked itself any new ideas about port cities. Simultaneously the ideal city made a model of conceptual design, resulting in not producing any solution to the problems of the port cities. During the growth of Antwerp, there were some major changes, which happened in the urban design and living. In Mediterranean port cities, the aim was to create a main frame or a spine, which wouldn't change for a long time, so that the people, who were not there for a long time, would figure out their way.

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In Antwerp, just the historical core remained as the same, and the new extensions or the new parts of the city were built completely different. Therefore in just few decades the city was not able to be recognized (Konvitz 1978, pp.20-21).

Figure 2.6: Port of Antwerp

Source: http://media.kunst-fuer-alle.de/img/36/m/36_79510~the-ancient-port-of-antwerp.jpg [2011]

The development in Antwerp followed the routes of ideal city planning, which affected the city core and then maritime culture that affected the extensions of the cities and the ports.

Since Antwerp became one of the biggest and busiest ports/wharfs in Europe, it got intensified just on the function. At the end of the 19th century the quays were straightened and quay walls were built for keeping the economical progress in order, which deprived the city from any urban development (Van de Put 2007, p.3).

2.1.4 Effects of Former Advances in Waterfront Development

The port is called as a city within the city. Accordingly port-cities are responsible for finding a new balance among the natural territory, including the water itself, the public domain of the urban system and the infrastructures of the port systems.

By the necessity of improving the hinterlands, it has been accepted that the port cities had commonly grown up more than the normal capacity of warehouses or infrastructures, and they became insufficient.

The progresses in construction and transportation systems that was possible by the advances in Industrial Revolution, which made the ports and the hinterlands to develop themselves into another dimension.

"It is necessary that the important industrial areas are contiguous to railway lines, the navigable rivers or the ports and to the main routes of terrestrial transports" according to Sert (1942); expresses the ideology of those times.

Easy construction techniques and the surplus of materials made the multi-functional hinterlands turn into transportation bases. And by the reason of railroad networks that were constructed for distributing the elements, cut the ports off the city, because in that period people were obsessed with mono-functional port developments for more profit.

In the port city, the public's access to other urban open space was drastically reduced during the early years of the Industrial Revolution: the migration from rural areas to the industrial cities and the rapid expansion of the latter consumed the internal open spaces and severed the urban from the rural (Hough 1984, p. 14).

Since the ports and the hinterlands were surrounded by railroad and motorway connections, industrial plants took the advantage and were spread over the waterfront's valuable lands. Accordingly the priceless unifying space of socialism, interaction and trade for the locals turned into isolated space from the city.

For saving the waterfronts from being cut off the city, fundamental precautions had to be taken, which was done in 1918.

2.2 PROMENADE LAW 1918

In 1918, according to only Remesar (2004, p. 37), the legislation of promenade law in Spain affected many waterfronts in the world. Even though this information can not be found anywhere else, he insists on; after it was legalized, it has transformed the relationship between the port and the city. Then recreational waterfront design continued to develop itself faster than before.

Initially, it had focused to create a space for leisure by having more facilities, water related activities and harbor life. The docks evolved into marinas, the warehouses became restaurants and cafes, so these changes made the waterfront serve for recreational purposes only.

Figure 2.7 Plan of Costa Smeralda

Source: Torre, L. A., 1989. *Waterfront Development.* New York: Van Nostrand Reinhold. p.111

These waterfronts have different additional facilities, which mainly served for tourists and high-class society rather than the locals, as recreational purposes were extremely expensive in those days. Water-related activities became popular by the presentation of

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boat races that were organized in the waterfronts like Costa Smeralda where there were high-energy waves, warm weather for more than 8 months in a year, the availability of marina and boating facilities, which were converted from regular ports.

Waterfronts in 20th century kept on this recreational space tradition, which started with the waterfronts like Costa Smeralda and New Orleans. But focusing on economic income and duplicating each other, resulted for most of the waterfronts to lose their own heritage and charm.

Figure 2.8: Costa Smeralda Marina Sketch
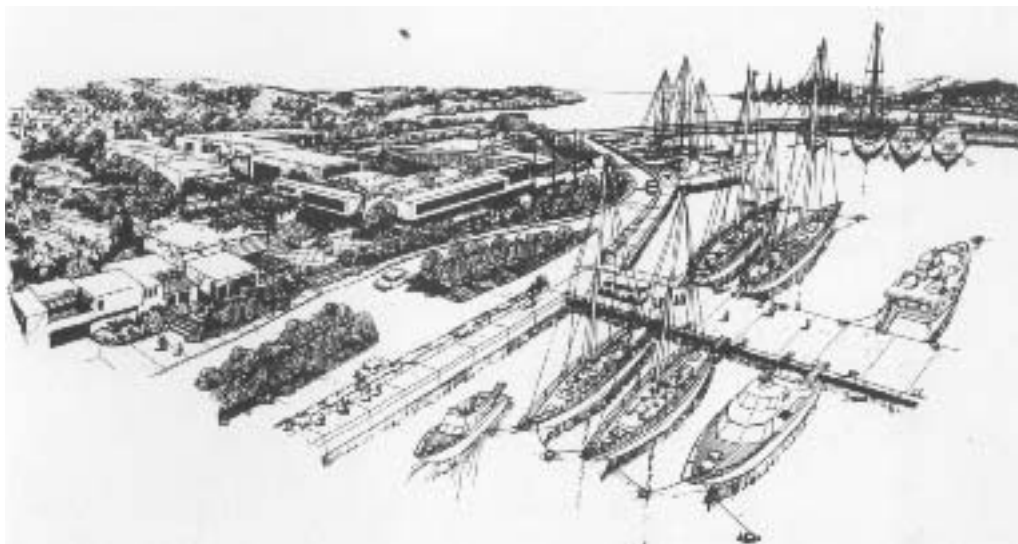
Source: Torre, L. A.,1989. *Waterfront Development. New York: Van Nostrand Reinhold.* p.111

By the time it was the end of 20th century people realized that recreational spaces on the waterfronts should not be just economic income oriented locations.

2.3 Differences In Design Approaches of Waterfronts In European and American Port Cities:

By the time American port cities were established, they were looking identical with that period's European Port cities, because there wasn't any other alternative that worked efficiently, but through the time they focused on trade and transportation. They modified the European maritime scales and applied it to their cities, because America

was not suffering any seafaring based wars. These new scales changed the size of the links, hinterland areas, port and their organizations. As the trains were the efficient transportation systems in America, their railroad connections to the ports were a must, which made the ports that also had started to be used for recreation purposes, being cut off the cities. But since the cities were establishing new, that created the problem for waterfront developments not to be built in the first place, and left them virgin.

Correspondingly, in Europe the ports were cut off the city by the railroads, too. But if they were compared to American port cities, European ones have been used for a longer time period and had evolved around the port. The separation of the port from the rest of the city affected the occupants and the relations with the city more than the American port cities, which made European ones to become abandoned spaces rather than virgin green spaces that were left for future use in America.

2.3.1 European Port City

As it has been explained in the Chapter 2 "History of City & Waterfronts' Developments" above, the beginnings of planned waterfront design constituted the first phase of port cities in Europe.

The second phase, which focuses on more professional design and creating sharp boundaries, is absolutely different from the first phase and lasts until the beginning of the 20th Century that also created modernistic city-port relations. The improvements on this professional designing approach were to create spaces such as in public scale were more organized, accordingly the cities had extended more precise.

These professional institutes decided that scaling port to development of the city, which was not something efficient. So the idea of separation of social spaces and the large infrastructures was born by the time they had new technological achievements in drainage systems that also meant, they tried to take nature under control absolutely.

In this second phase, the specialization and autonomous development of the port as an independent entity was first seen. Throughout the years, the improvements in European Port Cities continued and resulted in a variety of developments.

In order to emphasize the different types of waterfront developments in European Port Cities; the new developments in Bordeaux-France and Aker Brygge-Norway was chosen, because both of them were established in the phase that was told above.

2.3.1.1 The quays on the Left Bank, Bordeaux-France

Bordeaux is a Port city on the Garonne River in southwest France. Its quays experienced their golden age in 18th Century with maritime related improvements. Through the years it turned out to be an isolated space from the city's daily use; there wasn't any kind of connection between people of the French city and the river. Riverbanks were surrounded with metal fences, outdoor parking lots, warehouses; commerce and shipping that blocked the access to the Garonne, which all made river banks being abandoned.

Figure 2.9: Bordeaux Riverbank 1970's

Source: http://static.panoramio.com/photos/original/46381038.jpg [2011]

Figure 2.10: Bordeaux Riverbank 1970's
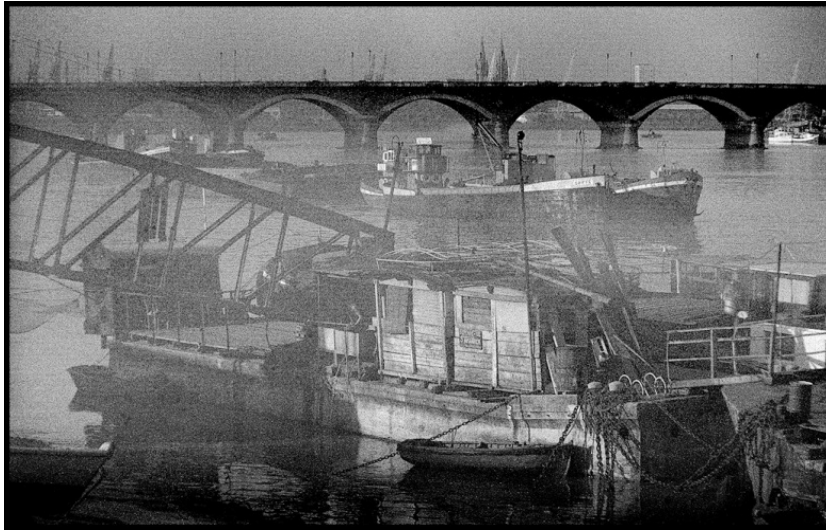
Source: http://static.panoramio.com/photos/original/46381027.jpg [2011]

Figure 2.11: Bordeaux Pedestrian Walkway

Source: http://static.panoramio.com/photos/original/62109550.jpg [2011]

In the early 80's, the deficiency was noticed and an urban master plan was developed to figure out the problems of economic and urban growth, which are articulated with the inner city's abandoned situation.

According to Thierry (2010), in 1990, the authorities realized the opportunities of the both riverbanks and developed its urban center for increasing the pedestrian activity. What was once a fast-moving boulevard along the Garonne River has been transformed into a pedestrian promenade that also connects the historic Unesco-designated civic center with cultural activity and public space to create community. This open space has

become the heart of Bordeaux's public life and a revenue generator as well. Unlike most of the waterfront developments around the world it can be called as a recreational waterfront development and serves for the daily purposes only (Duvoux et al. 2010 p.26).

Figure 2.12: Bordeaux Riverfront Multi-functional Spaces

Source: http://static.panoramio.com/photos/original/55870211.jpg [2011]

In order to create better spaces for pedestrians and public spaces like cafés, terraces and restaurants near by the historic fabric, the landscape was shaped as a smoother curve. The public transportation such as tramway, runs parallel to the pedestrian path, which is separated with the trees for paying importance to natural fabric of the city. The cycling lane located on the boulevard and longitudinal parking are also other transportation developments at the riverbank.

On the other hand, this redevelopment project also aimed to create a balanced microclimate by planting the riverbanks with gardens, which would be a complement to the existing urban fabric. So the success was articulated between the harmonies of the projects with existing urban fabrics. For that reason, each neighborhood had different approaches. But all the different approaches focused on multi-functional spaces, which serve for children, games, market, skating trail, parking, docking for boats, restaurants had been located between the waterfront and the boulevard. As a different treatment, the park, which transformed the grassy area into a multi functional space that can be used for exhibitions, promotion of arts, and for business, is located at Saint-Michel Quarter along the river (Thierry 2010, pp.28-34).

Figure 2.13: Multi-functional Park at North of Bordeaux's Riverfront

Source:
http://v5.cache1.c.bigcache.googleapis.com/static.panoramio.com/photos/original/60991056.jpg?redirect_counter=1 [2011]

The scale of this waterfront development is smaller in size compared to other mix-use waterfronts, but also as efficient as them in the criteria of recreational spaces.

2.3.1.2 Aker Brygge, Norway:

Figure 2.14: Aker Brygge General View

Source: Breen, A. & Rigby D., 1996. The New Waterfront A Worldwide Urban Success Story. pp. 34

Aker Brygge is located on the west side of Oslo's inner fjords-Pipervika-next to the expansion of Oslo in the 19th Century, which then became the city center. It was built as a shipyard in 1854, and being cut off the city in 1960's by the motorway. In 1985 it was converted into a mixed-use waterfront after the crisis in shipyard industry.

When Aker Brygge was re-developed, it stood out as a new urban area, which became an attractive part of the city (Gehl, Kaefer & Reigstad 2005, pp.70-80). It has been designed for 5.82 hectare of land (Remesar 2004) to contain mix-use of housing, offices, shopping, leisure facilities and urban spaces, which would accommodate the attractions in the area.

The urban design concept of Aker Brygge is to create a complete district that would be shaped as a compact traditional urban area with modern architecture where streets and squares were coordinated to activate outdoor spaces with pedestrian density. It was also directly connected to city hall, within short walking distance from entertainment quarter of Vika.

According to Gehl, Kaefer & Reigstad (2005) three main separate architectural projects, which are supported by the two newer projects that were designed, phases 1-3 combined;
a. 39.000m2 apartments

b. 81.000m2 offices

c. 18.000m2 shopping centers

d. 5.000m2 restaurants

e. 4.000m2 cultural attractions

f. 33.000m2 other uses

According to Remesar (2004, pp.45, 46) offices, shopping, restaurants, cultural activities and other uses are the dominant functions of operations that contain 78 percent of total construction area. The distribution of these dominant functions is;

I- The restaurants, cultural activities and isolated shopping were located on the 2 / 3 first stories, having direct connection to the streets.

II- On some blocks shopping was grouped in shopping centers with more stories.

III- The offices were located on the intermediate stories, having their own vertical access.

IV- Housing was located on the upper floors, having their own vertical access and frequently connections between blocks on the upper floors.

Figure 2.15: Aker Brygge General View

Source: http://static.panoramio.com/photos/original/2560077.jpg [2011]

Figure 2.16: Aker Brygge Marina and Residential Units

Source: Breen, A. & Rigby D., 1996. *The New Waterfront A Worldwide Urban Success Story.* p. 39

By 22 percent, apartments correspond to complementary urban function for avoiding the mono-functional spaces and for ensuring different urban activities 24 hours a day.

As it was told above, the area was developed in five phases that were based on a tight-knit grid. Some internal streets are provided through the commercial development that was built during the first phase. The street network is mainly for pedestrian use, with access provided for service. The promenade connects the main square to preserved old shipyard gate that is located facing the site for a future new library.

The building at the northeast corner provides a landmark that also advertises Aker Brygge.

Figure 2.17 : Aker Brygge Residential Slips

Another key component in visual character of Aker Brygge's area is that it has density and complex layering with a building scale being large enough in relation to street cross sections, but also compact enough to serve in walking distance. This layering is being emphasized through the buildings by using different materials that express the different use of layers (Gehl, Kaefer & Reigstad 2005).

The developments in complexity and variety of Aker Brygge were combined with the strong relation to the water, which makes Aker Brygge as a successful project. The promenade is directly connected to ferries and boats through the embankment, which increases the relation with the water.

Figure 2.18: Aker Brygge Public Space and Residential Units

Source: Breen, A. & Rigby D., 1996. *The New Waterfront A Worldwide Urban Success Story.* p. 38

The first phase (1985-86) covered the blocks closest to the city centre and involved the refurbishment of two existing buildings as well as the erection of a 'gateway' building on the corner facing Town Hall Square. The largest existing warehouse had been originally intended as a Norwegian Yacht Design Centre but transformed into a shopping centre. In phase two that was completed in 1989, the development was extended towards the SW, along the dockside and incorporating the large central public space, totally new build. In phase three that was completed in 1991 it was comprised the large mixed-use block forming the southernmost corner of the development. In phase four that was completed in 1998, it was filled in the western edge between the initial development and the route of the former east-west motorway through Oslo. Re-connection of the new developed Aker Brygge and the city center by creating a space that works efficient because it links to downtown, which is in immediate, specialized for pedestrians in the neighboring Town Hall were possible by the construction of underground tunnels for west-east motorway across Oslo in 1994. And also by re-locating the ferry terminal to Aker Brygge dock. This development has been successful in attracting large numbers of visitors due to its public spaces that offer the variety of

activities; good use of the views at different locations; the variety of uses within its buildings, its connection to water, to Oslo city center and also across fjord via its terminal.

On the other hand one of the early strategies of attracting people was offering cultural activities, but through the time institutions, drama schools, cabaret, theatre, and Imax-cinema was moved away. Holding open-air concerts and events became increasingly difficult as tenants moved in and whole cultural development was moved towards Oslo City Center (Gehl, Kaefer & Reigstad 2005).

Finally, it is an unique thing that happened in Aker Brygge; all phases can work together, and create harmonic urban fabric. A view of the Oslo Bay is never far away, and along the quay a handsome 13-meter wide walkway steps down to the water (Breen, Rigby 1996, pp. 34-39). And it is a mix-use waterfront development in such a small size compared to American port city developments.

2.3.2 American Port City

The early port cities that developed in the United States were virtually identical to their European counterparts. With the arrival of the Industrial Revolution and accordingly the railroads, there had been a big improvement. However, both the scale and the image of the cities changed dramatically. Initially, American port cities were the first points of the arrival, so the centers for the social interactions and also for entertainment as they were in Europe. As the commerce increased, the requirements for storage and movement ascended. In order to meet those requirements the railroad network and hinterlands grew as in Europe. The access of the inhabitants to the water's edge was cut off from the port cities by vast warehouses, rail spurs, wharves, and arterials that provided for distribution of goods. And the scales of these blockades, the distances between the downtowns and ports never have been in walking distances unlike Europe (Torre 1989).

By the introduction of the automobile, waterfront access was curtailed even further, where once was a promenade for strolling amid fish markets and harbors filled with ships from around the world, became an expressway. These expressways were generally elevated, to connect the one side of the city to the other side of the city, which turned the waterfronts into insufficient left overs.

It's unfortunate that the dream for growth and prosperity caused so many icons of the United States maritime legacy become lost before American society reached a high level of maturity and sophistication to demand access to their greatest asset, the water's edge.

On the other hand, in the redevelopment processes American Port Cities are aimed to include every possible activity and they became over-designed most of the time.

For emphasizing the negative and positive features of waterfronts in America; New Orleans and Tampa-Florida were chosen to express the variety of waterfront developments.

2.3.2.1 New Orleans

New Orleans is famous with its waterfront legacy, which includes one of the early cruise routes on Mississippi river.

According to Colten, C. E. (2001, p. 7) "What French sought in Louisiana was not just a city, but a productive hinterland." Therefore it was decided to build a city by the reasons of possible big port and hinterland, even though it was obvious that it had many negative specs as a city for living.

Figure 2.19: New Orleans River View

Source: Torre, L. A., 1989. *Waterfront Development.* p.62

Figure 2.20: New Orleans Riverfront and Woldenberg Park

Source:
http://v4.cache3.c.bigcache.googleapis.com/static.panoramio.com/photos/original/11003054.jpg?redirect_counter=1 [2011]

Geographer Peirce Lewis' famous characterization of New Orleans; "The impossible but inevitable city" (Morris 2011, p. 88) determines it was impossible to ignore the advantages of New Orleans.

When people decided to settle in New Orleans they realized that they had to protect themselves from the Mississippi River rather than connecting more to it. Although they tried to build higher riverbanks and infrastructure, the threat of catastrophic flooding was inevitable. Because much of local terrain lies below sea level, and by the result of this local topography that was created by the high ground river.

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According to Kelman (2006, p. 6) the false approach in New Orleans waterway design has been applied since the beginning. Accordingly ships returning home faced difficulties, and as in the city; municipal drainage system in 19th Century was raging from terrible to nonexistent.

According to Lauria (1994, p. 3) New Orleans became second largest and busiest port in US on the Gulf. Accordingly it had to have one of the busiest and complicated transportation routes via railroads and via motorways that cuts off all the riverbank around Jefferson Parish from the city.

Even though the city was build to focus on the port, it also grew as an agricultural settlement, by drying the swamps and creating agricultural lands. According to Colten (2001, p. 7), "Their efforts to establish an agricultural colony to support an urban center led to efforts beyond the bastide on the Mississippi, to a larger territory engulfed by the present city. This increased the scale and extent of intentional modifications".

Figure 2.21: New Orleans Riverbank Construction

Source: Torre, L. A., 1989. *Waterfront Development.* p.62

On the other hand the city grew as an urban center as well, but since the ports and hinterlands were blocking the access, it could never connect to its riverfront until late 1960's.

Figure 2.22: New Orleans Riverfront and Woldenberg Park Development Plan
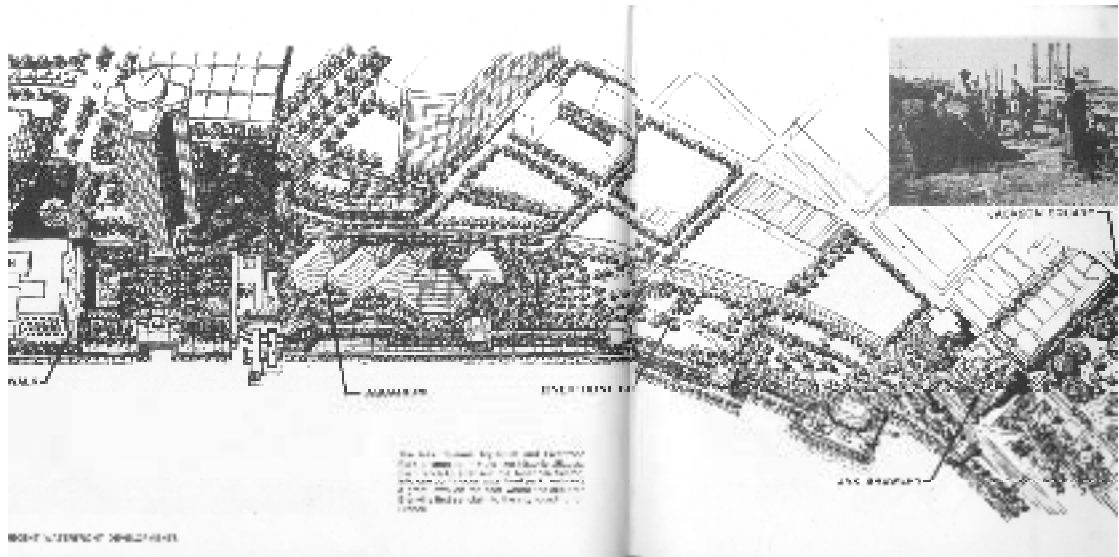
According to Lauria (1994, p. 24) there had been several attempts to redevelop the riverfront, one of the early re-development efforts were the International Trade Mart (World Trade Center), which was completed in 1968, and the River-gate Exhibition Facility in 1969. The world Trade Center is a 33-story office building with 520,000 square feet of office space. It houses consulates, international business and trade offices, federal agencies dealing with international commerce, shipping and freight companies, international law, banking, and insurance firms, and the Dock Board. The River-gate was New Orleans' first major exhibition and convention center. According to Lauria (1994, p. 25) the expressway by the riverfront created potential threats to the viability of French Quarter to the forefront. The Dock Board decided to have a study, which concluded that better results for ports by giving the possibility to contribute with new technological developments in cargo handling, freeway access, and expansion while freeing riverfront land for urban development in order to evaluate this possible threat. This study was including the relocation of the port facilities from downtown riverfront

to the Inner Harbor Navigation Canal and the Mississippi River Gulf Outlet and also the expressway.

Figure 2.23: Moonwalk and Woldenberg Park in 1999

After relocating the expressway and the port, there had been some major changes in the abandoned site; construction of Moonwalk, which is a 410-foot long, 12-foot-wide riverfront boardwalk adjacent to Jackson Square, is one of the examples. In order to avoid the threats of floods this walkway was elevated higher, which also decreases the connection of the people with the water.

The renovation of Jackson Square area included; the French Market, and the Washington Artillery Park (Baumbach et al. 1988, p. 9) as the early progresses and shore-up the upriver from Jackson Square section of the riverfront with a festival marketplace development, a Hilton Hotel Complex and a mixed-use commercial development: Canal Place, as the late progresses in this re-development project (Brooks, Wilkinson & Young 1984). This Hotel had 1,200 rooms and some recreational facilities and an international cruise ship passenger terminal (Baumbach et al. 1988, p.10). Later developments at the site include a high rise, residential condominium building and a riverboat casino (Lauria, Whelan & Young 1984, p.10).

Canal Place that was constructed as mixed-use commercial facility, located on a 13-acre site on the Quarter side of Canal Street and the River, had a 439-room hotel, 960,000 square feet of office and retail space, and a 1,500-car garage and was completed in 1979 (Young 1984, Lauria, Whelan & Young 1995, p. 10).

According to Lauria (1994, p. 20) riverfront redevelopment really did not begin to consolidate until after the 1984. As the theme implied, the riverfront was the focal point, but it was exhibiting its non-maritime riverfront development on the site that consisted of 82 acres bounded by the river, South Front, Erato and Poydras Streets. (Baumbach et al. 1988, p. 11)

> *According to Baumbach et al. (1988, p. 12); It was not until the opening of the New Orleans' World's Fair in May 1984 that the city truly reunited with the river. For the first time since the covering of the wharves in 1905, the city was physically, visually and psychologically linked with its riverfront. The 1984 World's Fair dramatized the vast potential of the river's edge.*

As it was determined above the fair was important for the continuity of the developments in New Orleans' riverfront facilities. Initially the New Orleans Convention Center was on a 15-acre site, containing 820,000 square feet of, which 381,000 square feet was exhibit space. A later addition doubled the exhibit space and added more meeting rooms, a larger ballroom in the 1990s and at the same time, the number of hotel rooms have almost doubled between 1975 and 1985: 10,686 to 19,500 (Brooks & Young 1993, p. 262). This development occupies a portion of three former Dock Board wharves. But all these transformations changed the way New Orleans was. According to Lauria (1994, p. 32) "If one looks downriver from the Mississippi River Bridge, almost all of the maritime wharves have been transformed into mixed-maritime/tourist or non-maritime/tourist use."

As an addition, the fair had also affected the area off the river in the Warehouse district. It made the transformation of Warehouse district into a residential neighborhood and

cultural area possible. Since 1984 1,036 apartments were built (Lauria, Whelan & Young 1984, p. 13).

According to Brooks & Young (2010) New Orleans city riverfront is the one by the Mississippi River, and it has been renewed also in 1986, but the renovation was limited to an aquarium and Woldenberg (Riverfront) Park that includes the river walkway, which was elevated from the sea level. When the Rouse River walk was designed it had 180,000 square feet of restaurants, shops, small eating-places and small boutiques (Baumbach et al. 1988, p. 16).

The transformation caused all the riverfront wharves turn into Convention Center, the Rouse Riverwalk or Hilton Complex and underutilized warehouses turn into inner city residential, cultural and entertainment enclave along the river.

According to Lauria (1994, p. 33) "Thus, for over 30 years the riverfront in New Orleans has been transformed from working wharves into a commercial/tourist/recreational riverfront."

On the other hand, shortly after the opening success of the Aquarium, the Audubon Institute presented to the City its "Riverfront 2000", which was series of riverfront plans that include expansion of Woldenberg Park, a museum, expansion of Convention Center and additional facilities for New Orleans Center for the Creative Arts (NOCCA).

Figure 2.24: New Orleans Riverfront Silhouette

Source: http://static.panoramio.com/photos/original/1847374.jpg [2011]

As it has been seen after the 2005 Katrina Hurricane, the drainage systems still have many problems dealing with the floods, which meant recreational spaces in New Orleans can not recover for a long time, after each flood

Figure 2.25: Sketch of Audubon Park Developments

Source: Torre, L. A., 1989. *Waterfront Development.* pp.61

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Figure 2.26: Audubon Park Sketch
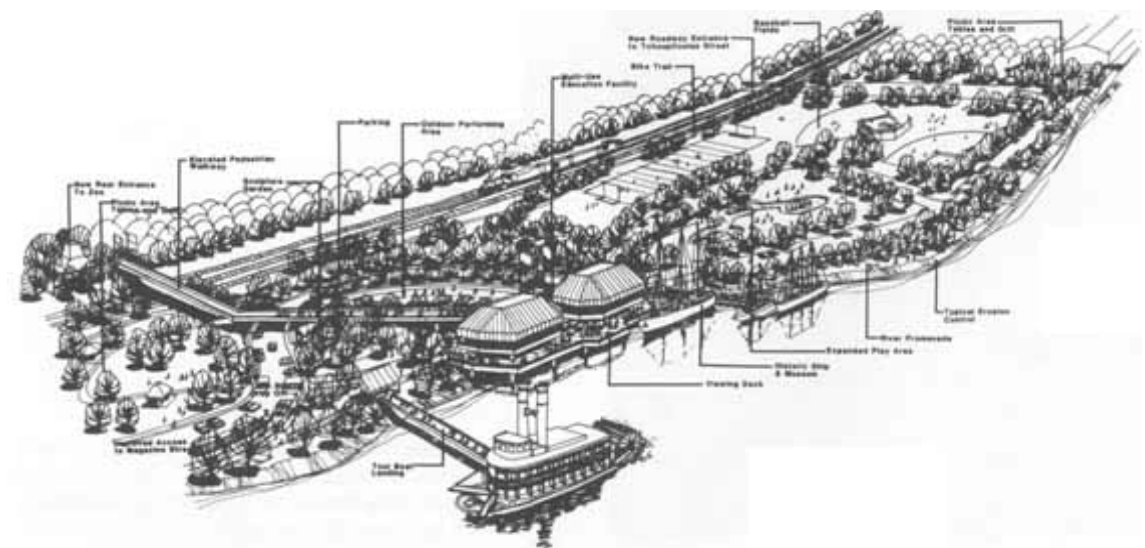
Source: Torre, L. A., 1989. *Waterfront Development.* p.61

According to Colten C. E. (2006) after three centuries of trying to exclude nature, people of New Orleans decided to bring the nature back to the city by building Audubon Park that became one of the most important recreation spaces in New Orleans. It gathers all the facilities; Audubon Insectarium, Audubon Zoo, Imax, swamp, golf course, and Clubhouse café. Although it was decided to build an extension as a riverfront for gathering more tourists and for making the transportation easier after this park had been built, it was still an achievement for New Orleans.

Figure 2.27: Sketch of New Orleans Developments

Source: Torre, L. A., 1989. *Waterfront Development.* p.77

But after awhile, the extension as riverfront in the older days, turned into an empty area with just a single dock, because of the same reason as before, the ignored region and unsuitable infrastructure underneath it.

Figure 2.28: New Orleans River Walls

Source: http://static.panoramio.com/photos/original/5934549.jpg [2011]

Figure 2.29: Satalite View of Audubon Park and Riverfront Extension

Source: Google Earth [2011]

Even though New Orleans has long edges to Mississippi River, people are more oriented to off river activities because of the storm-water and floods. They tried to build flooding-walls or higher riverbanks, where people can sit and enjoy the view, but these basic precautions were not as effective as it has been predicted, because the whole region was underneath sea-level.

Figure 2.30: New Orleans Variety of Parks
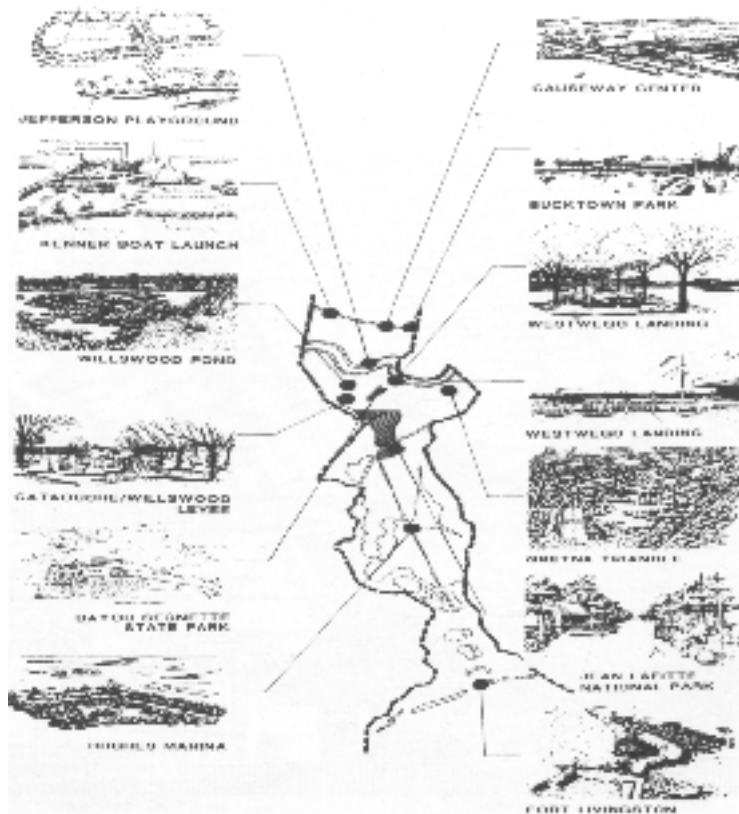
Figure 2.31: Milneburg 1910's

According to Colten (2001) New Orleans was selected by French because of the transportation abilities of its region. So On the Mississippi River the wharfs were built. This made the cargo loading on and off easier, but also caused the community to stay apart by the reason of transportation network.

Figure 2.32: Lake Pontchartrain 1930's

Source: http://www.stphilipneri.org/files/camps/unidentified/milneburg1920s.jpg [2011]

According to Campanella (2007) Milneburg was the early settlement on the south part of Lake Pontchartrain until the regulations and the insurance issues destroyed and turned into Pontchartrain beach as the photographs below demonstrates us.

Figure 2.33: Lake Pontchartrain's Stepped Seawall

Source: http://www.environmentmagazine.org/bin/p/c/losing-resilience-photo2.jpg [2011]

Lake Pontchartrain waterfront's development was hard to achieve, because it was stabilized 50 years ago to steeped seawall, which is not preferable for continuous activities like swimming, fishing, crabbing, by water's edge, so they had decided to landfill for creating parkway and recreation spaces. The Pontchartrain Beach development is the representation of the transforming attempt to a defunct amusement (Torre 1989, p.63).

Figure 2.34: Development Plan of Lake Pontchartrain's Waterfront
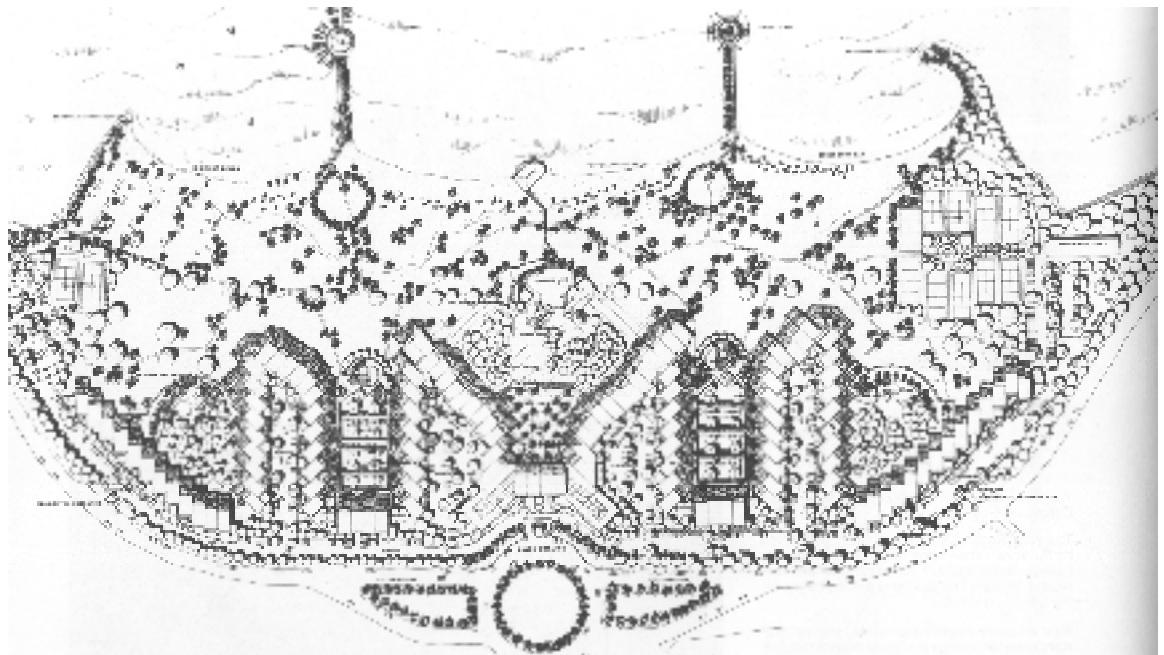
Source: Torre, L. A., 1989. *Waterfront Development.* p.64

The architecture of this project focused on modularity, the view of the lake and the overall texture, so the units were stacked and stepped back, allowing multiple-use of the roof and balcony, like the ones in Positano, Italy (Torre 1989, p.65).

Figure 2.35: Section of Lake Pontchartrain Structure
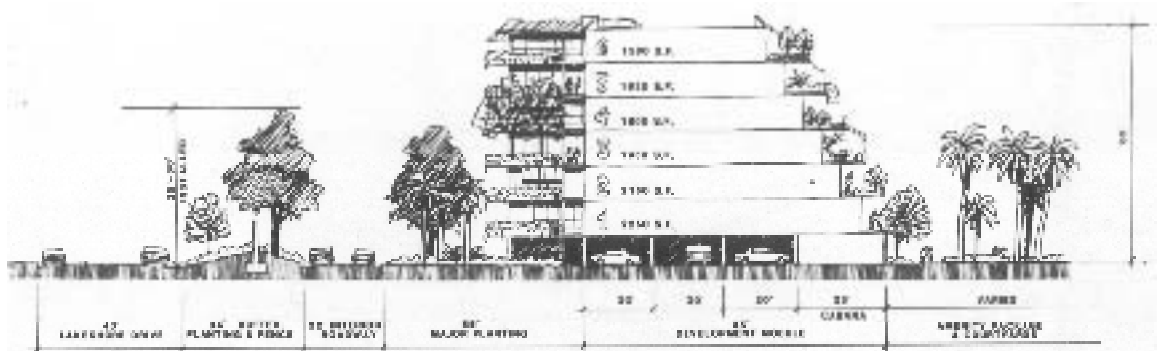
Source: Torre, L. A., 1989. *Waterfront Development.* p.65

Figure 2.36: Lake Pontchartrain View 1947

Source: Torre, L. A., 1989. *Waterfront Development.* p.65

Figure 2.37: Lake Pontchartrain 1947 Sketch

Source: http://forum.treasurenet.com/index.php?action=dlattach;topic=125240.0;attach=163784;image [2011]

The facilities on the beach were designed in soft coastal defense to respond common conditions. Although the final scale and texture had nothing to do with the original Milneburg, it was serving as a functional response to the "contemporary" city's desire to live at water's edge with the storm protection walls (Torre 1989, p.63).

Figure 2.38: New Orleans Riverbank Development Sketch
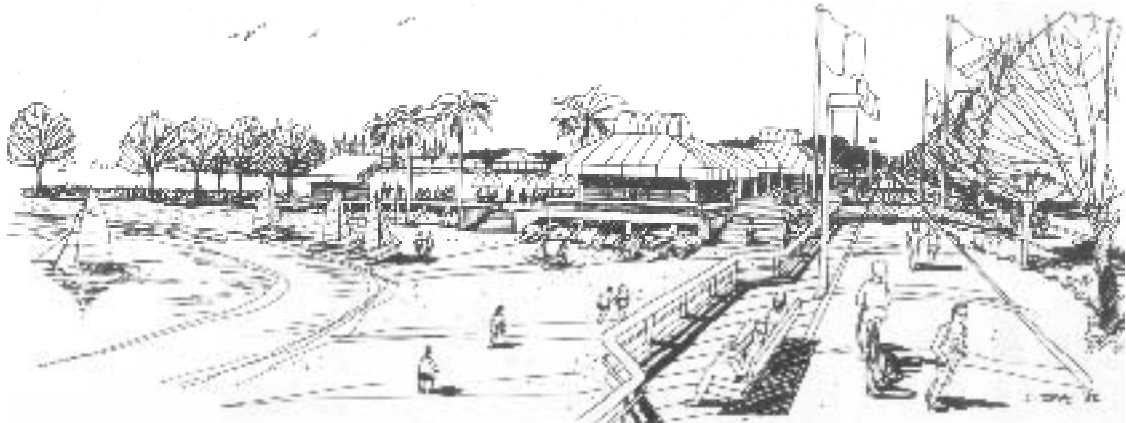
Source: Torre, L. A., 1989. *Waterfront Development.* p.77

By the time the beach was designed it has been hoped that the substantial theme would make the former appeal, which was ruined by poorly run seafood restaurants and bars that were inadequate, of the west end eventually returned to create a new waterfront development.

Being nearby to New Orleans University means there would always be a density of people to keep the waterfront alive, which is a great chance for Lake Pontchartrain waterfront.

Figure 2.39: Development Plan of Biloxi Beach and Biloxi Beach Waterfront

Source: Source: Torre, L. A., 1989. *Waterfront Development.* p.73

Figure 2.40: Biloxi Beach Waterfront Development Sketch

Source: Torre, L. A., 1989. *Waterfront Development.* p.72

Figure 2.41: Current Satellite View of Biloxi Beach Waterfront
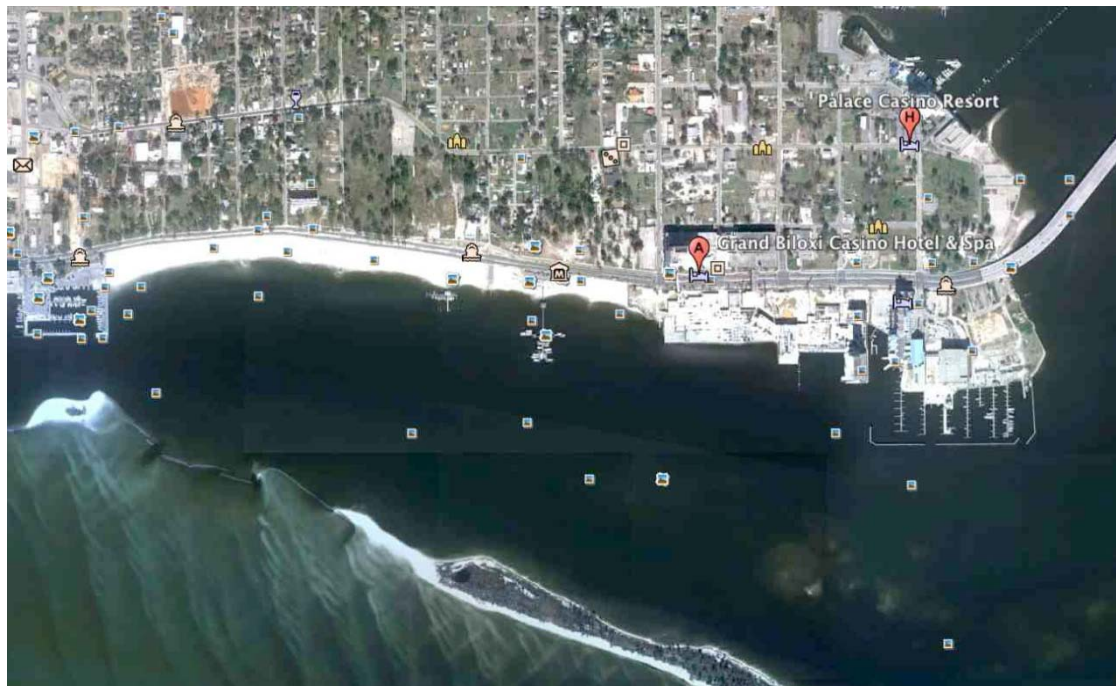
Source: Google Earth [2011]

Another waterfront development in New Orleans is the Biloxi Beach Waterfront. Mississippi Sand Beaches, which is also known as Biloxi Beaches, maintains 31 linear miles of manmade sand beaches. The irony is this sand was pumped to protect the seawall, turned into active economic basis of the cities. The accommodations, condominiums, restaurants, and a myriad of recreational facilities located nearby the Biloxi Waterfront to support beach use, even though the beach was eroding away. In 1986, the decision of having a more ecological oriented beach section was given. This master plan included replication of the adjacent barrier islands and adding up %20 more sand, which all would decrease the erudition from ten years to forty years, visual enhancement, and to increase the shading areas, which was a problem for that man made beach before. With more nodal developments, recreational facilities, restaurants, and the most important more waterfronts related attractions would provide positive economical effects (Torre 1989, p.71).

Figure 2.42: Old and Renewed Sections of Biloxi Beach

EXISTING STREET / BEACH SECTION

PRIVATE PROPERTY | 60' STREET RIGHT OF WAY | EXISTING BEACH | MISSISSIPPI SOUND

PROPOSED STREET / BEACH SECTION

PRIVATE PROPERTY | 60' STREET | 20' PARKING CLUSTERS | WALK-WAY | PROTECTIVE BARRIER 100' MAX. | OPEN SAND BEACH 100' MIN. | MISSISSIPPI SOUND
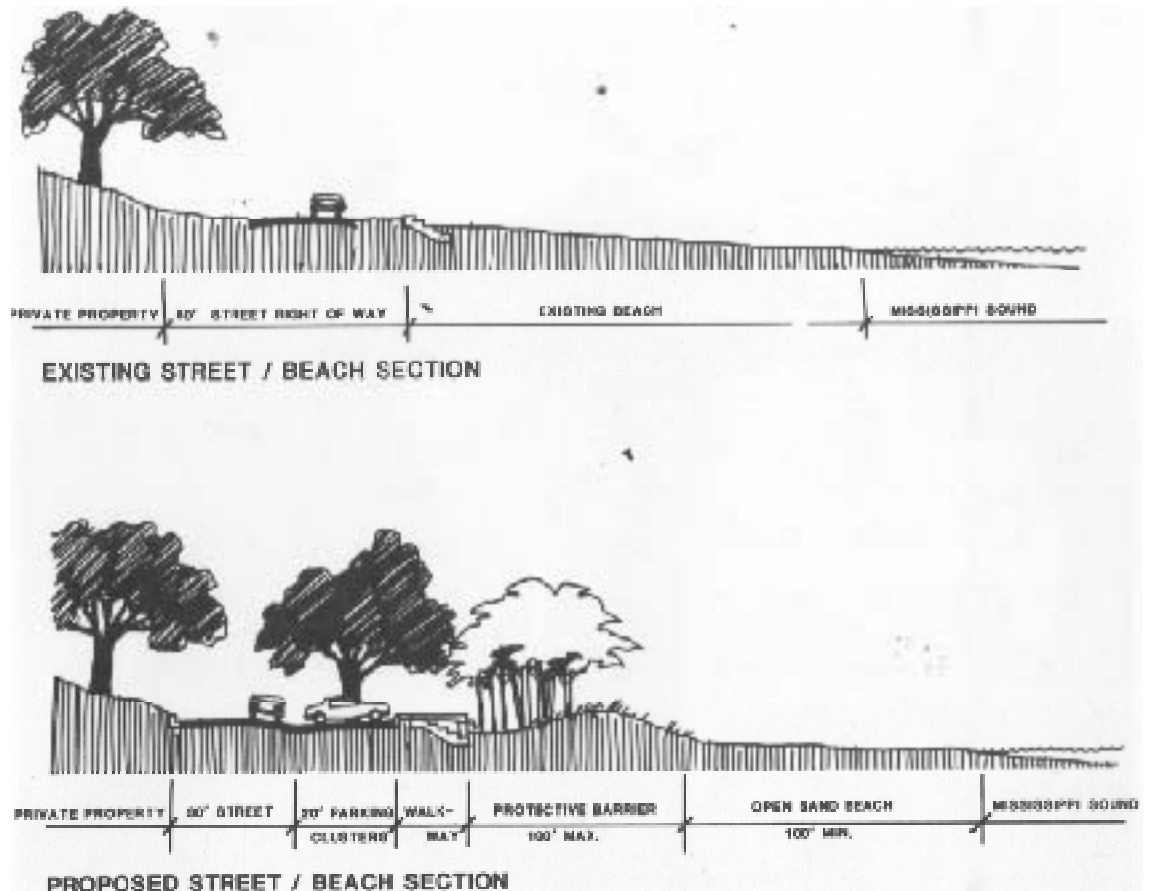
Source: Torre, L. A., 1989. *Waterfront Development.* p.81

Figure 2.43: Section of Biloxi Beach Waterfront Development

OAK TREE PLANTING — FLOWERING TREES — PALM TREE PLANTING — RESTROOM / SHOWER

OVERHEAD WALKWAY — HIGHWAY 90 — PARKING — EXISTING SEA WALL — FISHING PIER
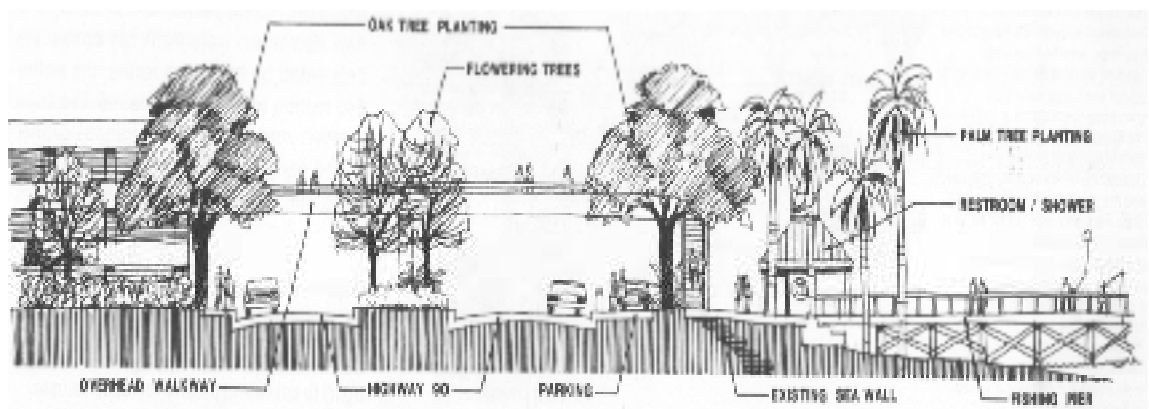
Source: Torre, L. A., 1989. *Waterfront Development.* p.75

49

Figure 2.44: Biloxi Beach Waterfront View-2005

New Orleans' region has different characteristics when it's compared to other regions. The reality of hurricanes, floods and storm-waters are really effective here. So by the edges of Mississippi River, it has been preferred to construct high-level ports, which creates a dilemma between the waterfront and its water connections.

In past decades, this dilemma was tried to be avoided by creating different types of waterfronts like Woldenberg Park Waterfront, Audubon Park's riverfront extension, Biloxi Beach Waterfront and Lake Pontchartrain Waterfront.

In Woldenberg Park Waterfront, the high level promenade created a connection problem for the people with the water. Whole point of the waterfront is to create the unifying space between the city and the water for expressing the dynamism, but in this waterfront it is just scenic view of industrial plants across the river.

Audubon Park was not designed to serve as a waterfront in the first place, but it was renewed with the extension to the river in order to gather more tourists and became riverfront. The plan was involving connection with the water itself, but here the region created the same problems. When the riverbanks were not enough to protect the riverfront, floods and storm waters made the extension lose its appeal and turn into an empty space.

Lake Pontchartrain was designed to return the appeal of the west end waterfront back. It was well connected to the water, it had the facilities and the links with the city, but in time hurricanes took all the appeal of this Waterfront.

The conclusion is all these waterfronts didn't have the infrastructures that the region enforced, so these developments were not suitable for the territory and after the hurricanes and storm waters damaged, they were abandoned.

2.3.2.2 Tampa Riverfront, Florida

Figure 2.45: Bayshore Boulevard View

Source: Torre, L. A., 1989. *Waterfront Development.* p.100

Although Tampa was established few centuries ago, most of the development was in the 20th Century. It has been slowly growing and reshaping ever since with high influence of surroundings. Until recent decades, full potential of waterfronts has never been used especially around the downtown business district, even though the port itself is one of the biggest in USA.

According to Community Redevelopment Plan of Tampa (2004), from the beginning the character of the Channel District, which was developed to serve the Port of Tampa, was maritime-related. Additionally, the private shipping interests gave Tampa its earliest reputation. In mid-1970's, when the commercial use of containerized shipping displaced general cargo shipping in Tampa, the Channel District, known over the years as the Ybor Channel area, that was home to ships' chandlers, shipping companies, bonded warehouses and thousands of longshoremen loading and unloading general cargo ships.

Even though there had been early attempts for using the advantages of the waterfronts by building The Tampa Bay Hotel, a quarter-mile long luxury resort hotel in 1891, industries moved into the area and the public use of waterfronts was delayed.

Figure 2.46: Development Sketch Tampa
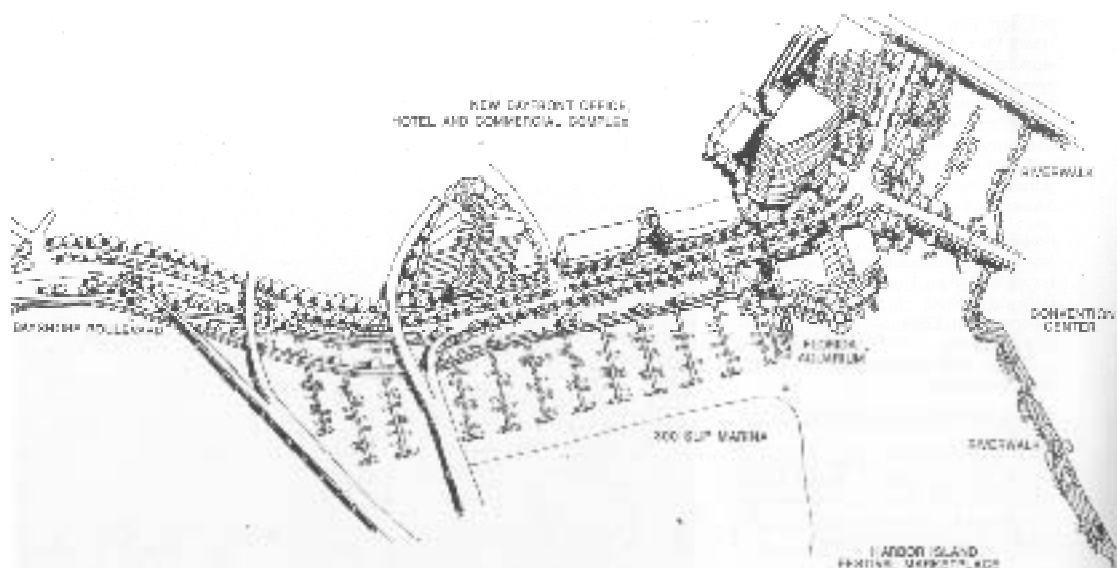
Source: Torre, L. A., 1989. *Waterfront Development.* p.100

According to Myat (2008, p. 2) ever since the 1970's there have been some attempts for developing this waterfront area, but none of them could be successful. Because like many cities across the country, Tampa found itself in the 1970s with a downtown that largely turned its back to the water and that was substantially depleted with the move of housing and businesses to the suburbs (EDAW 2006, p.28).

Additionally, as the water's edge became home for commercial fishing, maritime, and industrial uses; the understanding of using the riverfront for entertainment became dramatically less charming than before. The recreational uses also had disappeared and made the waterfronts turn into the increasingly empty bleak spaces (EDAW 2006, p.28). Community Redevelopment Plan of Tampa (2004) suggests, turning point for the area was the decision by the Tampa Port Authority to acquire waterfront property on Garrison and Ybor Channels in the mid - 1980's. Developing an ambitious master plan for the property's redevelopment became high priority. Even though the original master plan was never constructed, it came into question in the early 1990's, and has evolved today into Garrison Seaport.

Although it's always thought Bayshore Boulevard is the single most important image of Tampa-Florida, the river walk by the Hillsborough River is one of most important assets for revitalization of the waterfront and the City of Tampa itself.

The river is a natural attraction that could bring in more recreation spaces, businesses, residents and revenue, which would help revitalize the downtown and the surrounding areas (Myat 2008, p. 38).

By the time Bay Shore Boulevard was designed, the main idea was to integrate a scenic view with the history related waterfront for recreational purposes. For that reason, waterfront's master plan included more recreational facilities, which surrounded the waterfront and supported for keeping it alive; like water-sports center, new festival market, office buildings, and a convention center.

The Channel District should be considered to be a part of the downtown area, particularly as redevelopment progresses. The difference in character today can be attributed to several factors; the physical and visual separation of the Channel District and District of Business Center by rail yard (Community Redevelopment Plan of Tampa 2004, p.10).

In the older days the downtown rail lines, which were shipping and industrial related, had been used along the Hillsborough River, but during the re-development they were demolished where public cultural facilities and parks were constructed. The Ashley Drive was transformed into a landscaped boulevard; it became the entryway to the CBD from the new Interstate 4. Afterwards the high-rise development became predominant in the CBD by creating the feelings of much different from surroundings and these redevelopment efforts have continued to evolve Tampa's pre-World War II downtown into a modern, regional urban center that is connected to its waterfront.

The redevelopment session includes the renovation of the way Channel District's presentation; it would still be maritime and water-related, but also it would include a much better contribution with the CBD, Union Station, and Ybor City. And also consists of a broader range of new land uses, including residential, retail and entertainment uses.

The Channel District has been characterized by land uses that supported surrounding maritime and industrial activities. Although the existing residential uses have been considered as urban pioneering, they have not been compatible with the dominant industrial surroundings. The Channel District still has potential for additional developments, including housing. Twenty-two percent of the parcels in the area are vacant (Community Redevelopment Plan of Tampa 2004, p.14).

Figure 2.47: Cotanchobee Park

Source: http://www.tampabaydragonboats.com/Portals/0/dragboat_tpa_06-188.jpg [2011]

As well as the new developments, most of the existing structures within the Channel District are being used as commercial buildings that were originally used for maritime - related commercial, light industrial or distribution uses.

Figure 2.48: Redevelopment Plan of Tampa Riverfront South Expansion

Source: Myat, T., 2008. Knitting of nature into an urban fabric: A riverfront Development. p.52

As a contrast, when the Marriott Hotel was built, it has used the river very wisely with a modern approach of riverfront porch area that runs along the river and also has boat

slips that allows their guests to dock right in front of the hotel. This river walk area beside the Marriott Hotel contributes with Cotanchobee Park and is one of the most active and pleasant areas throughout the whole river walk. Even though this park has been serving the green space and also contributes with the St. Pete Forum by creating the space for gathering people from the forum, it could not bring in the density that an area like this should have had.

Figure 2.49: Cotanchobee Park

Source: Swartz, C. 2008 *Connecting Water To Architecture: A Resource Management Tool.* p. 26

Figure 2.50: View of Cotanchobee Park

Source:
http://www.propertyware.com/pw/setup/mail_merge_images/36571518/TampaSkyline.JPG[2011]

According to Myat (2008, p. 50) St Pete Forum is another important feature in this area, which gathers the concerts, sporting events, and other events that draw many people.

But also according to site analysis done by Myat (2008), the points of attraction are disconnected from each other. Accordingly the Tampa Bay Performing Art Center, the St Pete Forum, and the Florida Aquarium, which need sub-attractions in the distance between each other in order to keep the visitors interested, are the attraction centers.

Figure 2.51: Cotanchobee Park

Source: Swartz, C. 2008 Connecting Water to architecture: A Resource Management Tool p. 25

The Channelside Bay Plaza, a mixed-use building is located to the east of the site. This is a very active area that could label as an entertainment area; contains many restaurants, bars, shopping centers, movie theaters, and dance clubs.

Figure 2.52: The Sections of Tampa

Source: Myat, T., 2008. *Knitting of nature into an urban fabric: A riverfront Development.* p. 39

The problem of this plaza is that it cannot connect with its surroundings and even the water. It has the activities that could link into the riverfront site and visual connection to Harbor Island. This close proximity to Harbor Island can and should be used to bring more pedestrians into the area. This 177-acre island is packed with residential buildings, offices, and retail developments (Myat 2008, p. 51). Accessing of the Harbor Island has three alternatives; vehicles, pedestrians, and boats. Even though it is an island, the accessibility is easy, the preferred access alternative getting there should be by the water, which allows boaters and water-taxi passengers to dock and walk right up to the site, so it can easily contribute with the waterfronts across the river.

On the other hand, for making the new river walk to be successful there must be an intricate tie between the places of interest that provide a smooth transition from one area to another. But according to Community Redevelopment Plan of Tampa (2004, p.9), the Channel District became an urban and commercial neighborhood in that kind of a transition. Because on Channelside Drive, the Florida Aquarium was opened several years ago, afterwards many new cruise terminals for a growing list of ship operators have been opened, the Port Authority has completed a new corporate headquarters and it is well connected to the port in the context of vital economic purposes for the Tampa (Tampa Comprehensive Plan-Coastal Management 29 January 1998).

Channelside at the Seaport contains a 250,000 square foot entertainment / retail attraction spaces that was opened in 2000. The heart of the District, north of the Seaport and south of Twiggs Street, is still composed of older warehouse and loft buildings. Some of them are still in active use as offices, art and dance studios, entertainment and residential. And still there is demand for new residential and office spaces.

Figure 2.53: Channel Side District River Density Map

According to photo observation that was done by Ali Berk Pilgir (January-2011), the Cotanchobee Park has an unique advantage, because two bridges that supposed to connect downtown to the island, block the cruise ships and also protects the marina that is located near to the park, which has soft coastal defense that enables the park get more connected to the natural developments. Actually the Pete-forum was added to keep the Cotanchobee Park alive, which is one of the main green spaces of Tampa.

Figure 2.54: Inside View of Tampa Aquarium

Figure 2.55: Aquarium View

Source: Ali Berk Pilgir [2011]

The forum and the Cotanchobee Park are supposed to connect each other, but as it had been told above they are disconnected. Other than these district redevelopment projects, there were three other nodal developments like; Gasparilla Cultural and Heritage Museum, an aquarium, and marina slips. The income of the waterfront was based on waterfront activities and services such as River Café, Aquarium, and Transportation Center where the visitors can get tickets for river cruise upstream on the Hillsborough River to the renovated Lowry Park Zoological Garden. This family-attraction based facility had created a link to the facilities to Bayshore Boulevard.

Tampa is one of the best-known locations of Florida. Even though big renovation project designed more than two decades ago, the waterfront has kept on developing itself. So it looks familiar with the current trends, but as a waterfront it is far from leading the city for further development.

Figure 2.56: Tampa Port 2001

Source: http://static.panoramio.com/photos/original/32528047.jpg [2011]

Finally, the redevelopment of Tampa's riverfront converted it to mix-use riverfront, but compared to European examples it is too big and insufficient. There are no complex layering that would bring the compactness and integrity to the waterfront development. And the port related redevelopments and re-functioned former structures are keeping the heritage of Tampa, but it lacks in green architecture and technologies, which causes failure of "Sustainable Architecture" in Tampa.

2.3.3 CONTEMPORARY APPROACH

Through the end of 20th Century, concept of ports has started to be considered as more than just a space where the port activities are underestimated. The economical advantages could not be ignored any more, which created a dilemma. The reason was, income oriented port activities were demanding large-scale organizations, and the others were demanding decentralization. In most of the waterfront re-designs included moving the ports into a new location, so they could expand without ruining the connection between the city and its waterfront.

The development was not just on port activities. Since it has been proven that soft coastal defense and new water management trend, which both do not try to take the nature under control, have more economic advantages. They have been used for re-designing the waterfronts, but the real advantage of soft coastal defense was, it made possible to improve the ports for recreational uses.

For emphasizing the contemporary multi-functional approach with its green spaces; the Yokohama Minato Mirai 21 was chosen.

2.3.3.1 Pasifico Yokohama, Minato Mirai 21

Figure 2.57: Yokohama Minato Mirai 21 Ariel View

*Source:*http://courses.washington.edu/gehlstud/WEBSITE_CONTENT/Autumn2010/MinatoMirai21.pdf
[2011]

Yokohama is an old commercial trading city, which was departure point of silk trade in Japan. After 1930's its heavy industry started to rise in Yokohama's waterfront for benefitting from the advantages of the port. This period lasted more than 50 years until the ports could not meet the requirements of the upcoming trends. At the end this period, it was converted to be a multi-purpose waterfront. Minato Mirai is the urban waterfront development in Yokohama, which is the second largest city behind Tokyo in Japan.

According to Doo & Feliciano (2010, p. 3) the re-development of Minato Mirai 21 waterfront has started after the Mitsubishi Industries moved away from the port in 1983.

Figure 2.58: Minato Mirai 21 Area Before Construction (1980)

Source: "Yokohama Minato Mirai 21: Plans and Projects" Brochure, vol. 81, 2010

When the transformation of the waterfront has started, Yokohama had been a disconnected city from its

neighborhoods since 1960's. The railroads connecting the transportation network to Tokyo was cutting off the north, and business centers created an involutes core on south, which caused Yokohama to be "suburban town". Yokohama waterfront was located at the middle point of these two cores and had the mission of connecting these cores with a true city center.

Accordingly Yokohama had to have a design concept that would convert the old harbor, industrial areas and related areas to a waterfront center that has to achieve the objectives;

- A more self-sufficient Yokohama; creating an economically independent Yokohama

- A Transformed Role for the port; improving port functions and transform the waterfront into a citizen's harbor.

- A decentralized capitol region; decentralizing Tokyo with respect to its official, commercial, and international conference functions.

According to Doo & Feliciano (2010) this transformation includes land reclamation, land adjustment, construction of new infrastructure, public facilities, housing and business developments. The variety of extensive amenities provides opportunities for people to stay and enjoy themselves, especially 24/7. The land use specs of the development;

Buildings including offices, commercial, residential: 87 hectares

Parks and greenery: 42 hectares

Port facilities: 11 hectares

Figure 2.59: Yokohama Minato Mirai 21 Master Plan
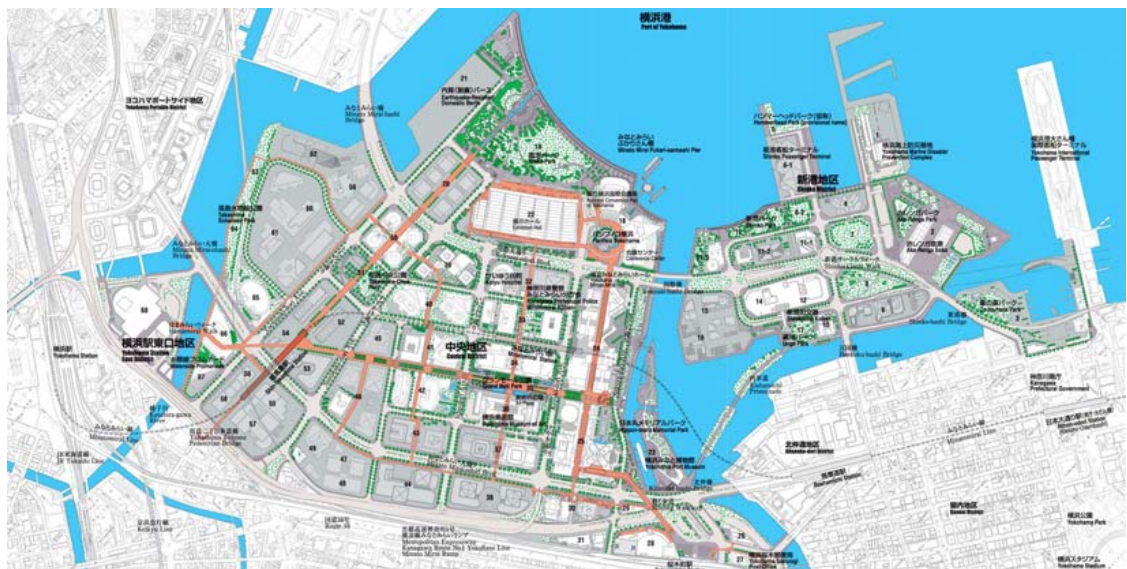
Source: Yokohama Minato Mirai. *Plans and projects,* Vol 82

Figure 2.60: Yokohama Minato Mirai 21 Ariel View

Source: Breen, A. & Rigby D., 1996. The New Waterfront A Worldwide Urban Success Story

According to Breen & Rigby (1996, pp. 26-31) along with the accommodation and 10.000 residents units, there are facilities for business, which surround the hotel. Three meeting rooms, conference center and National Convention Hall of Yokohama are located next to the hotel. The convention center is a huge structure, which has the capability of containing five thousand seats, has large seaside lobby and complete glass frontage. The exhibition hall is another huge structure, which have ten thousand square meter of column free area, has great effect with its terrace over the water's edge.

Figure 2.61: Axes Feeding Yokohama Minato Mirai 21
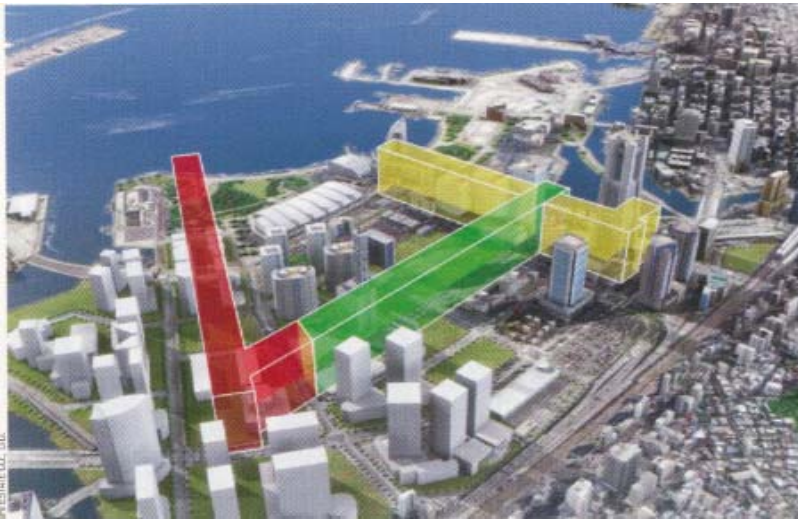
Source: Rebecca Green and Tatsuo Nishimoto, "Reviving Japan's Gateway", Urban Land, Mar. 2005, p. 66.

As addition, it had focused on creating the public space exclusive of traffic like the most of the waterfront developments around the world. This pedestrian network includes three city axes, which link Sakuragicho Station, Pasifico Yokohama, Nippon-Maru Memorial Park, the landmark tower and Rinko Park, serving the main pedestrian corridor.

Figure 2.62: Yokohama Main Promenade

There are several green spaces that surround the waterfront and also promenades, which link people to the special features of waterside environment. In order to ensure the access to this waterside environment the green spaces that comprise ¼ of the total development, contribute with the promenades.

Zou-no-hana Park (2006 - 2009)

Figure 2.63: Zou-no-hana Park

It offers views of the waterfront and the restored 19th century breakwaters.

Area: 3.6ha Facilities: Resthouses, lawn space, terraced embankments, breakwaters

Shinko Park (1998 - 2001)

Figure 2.64: Shinko Park

It offers an intimate connection to the water's edge and a grass lawn from which to enjoy the harbor views.

Area: 2 ha

Facilities: Lawn space, terraced embankments, emergency underground water tanks.

Kishamichi Promenade, Unga Park, Promenade (1995 - 2001)

Figure 2.65: Unga Park

This promenade and park were along old railway tracks.

Area: 2.2 ha

Facilities: Garden path, lawn space, water square.

Rinko Park (1998 - 1999)

Figure 2.66: Rinko Park

It is the largest park in it and contributes with waterfront by following its curve.

Area: 9.3 ha

Facilities: Lawn space, terraced embankments, tidal basin, parking lots, concession stands.

Waterside Park and Promenade (2006 - expected: 2011)

It has the views of the Katabira-gawa River and the promenade will link Minato Mirai-odori Boulevard to Route 1.

Area: Park: 1.3 ha, Promenade: .2 ha (330 m length, 6 m width)

Facilities: Pedestrian walkway

Figure 2.67: Waterside Park and Promenade
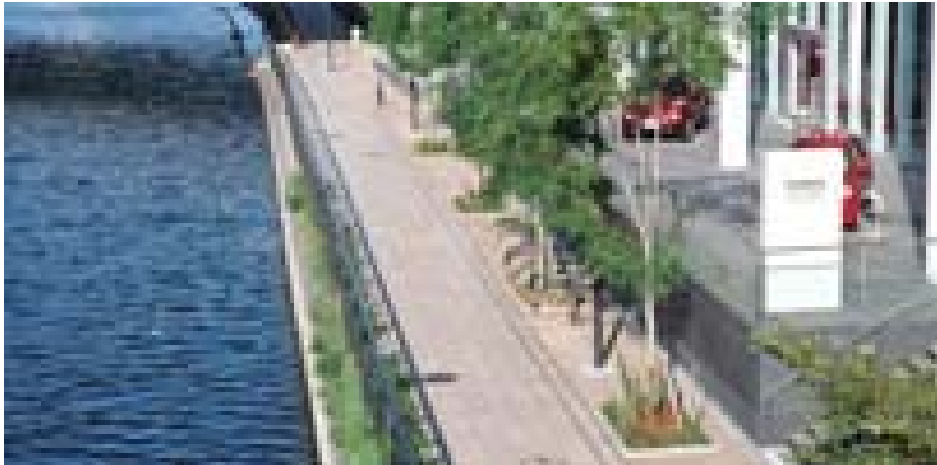
Along with parks there are facilities for business; three meeting rooms, conference center and National Convention Hall of Yokohama are located next to the hotel.

The convention center is a huge structure, which has the capability of containing five thousand seats, has large seaside lobby and complete glass frontage. The exhibition hall is another huge structure, which have ten thousand square meter of column free area, has great effect with its terrace over the water's edge. (Breen, Rigby 1996, pp. 26-31)

Finally if the transformation of the city is considered, which was provided by this waterfront development, it could be said it is a successful project by the reasons of complex layering and public spaces. According to Doo & Feliciano (2010, p. 13) there are several down sides of MM21. The promenades and paths are too long and over prescribed, which causes little opportunity to "wander" and "surprise". The plazas are empty because they were designed out of scale. The skyscrapers make certain areas seem empty and exposed. But the worst one is; there is no direct interaction with the water, by the reason of rising of the sea level and storms.

3. METHOD OF COMPERATIVE ANALYSIS

Analysis of selected waterfront developments

I. Specifications-> Planned area in urban development, cost

II. Relations with the city

Location	: Sea, creek, river
Surroundings	: Silhouette, solid void relation and function variety of other structures
Accessibility	i. Distance between downtown and waterfront
	ii. Duration between downtown and waterfront
	iii. Alternatives
	iv. Number of city links, and their connections
	v. Gate
	vi. Entrées

III. Comparison of waterfront developments

a. Waterfronts Types	: Recreation, residential, multiple-use
b. Waterfronts Connection	: How well the waterfront is related to water
c. Waterfront's Public Space:	i. The hard-surfaced public space
	ii. The soft-surfaced public space
	iii. Active soft-surfaced public space
	iv. Passive soft-surfaced public space
	v. The ratio of green space area to total planned waterfront area
d. Promenades	: The relation of the promenade with the water
	: The variety of promenades
e. Facilities	: Facility chart
f. Water Refinement	: Ratio of refined water

g. Sustainability   : Sustainable technologies and landscape

h. Cost   : Construction Costs

i. Concepts   : Goals that were aimed to be achieved

j. Tourists   : Number of tourists that had visited in 6 months

            period in 2010

4.   CRITIC ANALYSIS OF SELECTED WATERFRONTS

"Major transformation" doesn't just include huge scale schemes, it can also be small in size, but the impact that they had created is important. Many of the developments have significant effects over the citizens at that location.

There are many major transformations in waterfront design, but Baltimore is a different story, even though according to many architects it wasn't a successful project, it became an archetype for waterfront design (Breen & Rigby 1996).

In the last three decades, major waterfront development has been arising, as the public had demanded its ports back. Rehabilitation has affected the port cities all around the world; based on desire to work, play, and to live at the water's edge. Boston, Baltimore, Seattle, San Francisco are the original innovators of this reshaping process which started in late 70's have shown the way to the other cities. It wasn't just the locals who supported this renovation for waterfronts; the millions of tourists had also supported, and provided the basis for a new positive economic impact on the community. But this waterfront rebirth has gone even further than original models in use and scale. Baltimore Inner Harbor, Barcelona Port Vell and Shanghai Expo 2010 are the chosen ones for the comparison.

Why Baltimore, Inner Harbor: Baltimore was one of the first successful re-discovery of the waterfront developments and it has inspired the whole world.

Why Barcelona, Port Vell: The aim in re-development in Port Vell is to destroy the barriers between the city and the water, which was built a long time ago.
According to a thesis "The new Waterfront: Segregated Space or Urban Integration", the autonomous port of Barcelona, as the promoter of this plan of action, is making the

port to revitalize the city, without losing its identity as a port. In order to meet these requirements that were planned in this project, the Autonomous Port of Barcelona has set up the Urban Development Project; Port 2000.

Why Shanghai Expo 2010: Shanghai Expo 2010 symbolizes the future advances in waterfront developments. It has converted such a languished city into a worldwide known waterfront. And the most important thing is, it has the aspect of totally sustainable design that it is evolving into.

4.1 BALTIMORE INNER HARBOR

Figure 4.1: Baltimore-Inner Harbor Panorama View

Source: Ali Berk Pilgir [2011]

Baltimore is an old port city that was built in 18th century, and became one of the most important ports on the east coast. After the shipping yard was relocated; the harbor was converted into an idol model for the whole world. There are plenty of reasons for its success and two of them are Harborplace and it has never been cut off with a highway or railroad network from the city like the other waterfronts in the world. Since Baltimore was at the beginning phases of development as a city, it was easier to control the new progresses like the highway, whose project was re-arranged before the master plan of Baltimore was finished (Millspough 2003, p.38).

Figure 4.2: World Trade Center

Source: Ali Berk Pilgir [2010]

Figure 4.3: Baltimore Inner Harbor Marina View

Source: Ali Berk Pilgir [2010]

According to a case study "The Inner Harbor Story" by Millspough (2003, p.37) in early 60's Inner Harbor was abandoned by shipping industries and soon surrounded by business. The master plan for re-development, which was developed by Wallace, Roberts & Todd, had 3 phases. First one was a row of prestigious sites for office buildings along Pratt Street facing the waterfront started with Baltimore World Trade Center. Secondly, multifamily housing projects to be developed in the eastern and western sections of the waterfront. And as thirdly a public playground for Baltimoreans in the center along the shore of Inner Harbor.

Figure 4.4: Hotel and New Convention Center

Source: Ali Berk Pilgir [2010]

In 1973, shoreline around the Inner Harbor was redesigned and rebuilt in a larger scale to express the public spaces and also for making the access easier to the 35 feet-wide promenade, which is the spine of the project.

Since there was no water-traffic around the Harbor, it was suitable for creating a marine, which be the last point of journey and also would increase the number of activities that would connect the public areas within the waterfront.

The activities like "Sunny Sundays", festivals and using the maritime culture elements like old ships; encouraged the marina occupancy, tourist attraction, which was not one of the main purposes of the Inner Harbor development, and museums on the waterfront.

Figure 4.5: National Aquarium

Source: Ali Berk Pilgir [2010]

Between 1979 and 1981, five more major attraction centers like; Convention Center, National Aquarium, Inner Harbor Hotel, Maryland Science Center and Harbor Place, which was created by James W. Rouse and gathered all the attractions into a critical mass, were added to the master plan. According to Bruttomesso (1991), Harborplace is one of the key points of Baltimore's renewal project. It turned an empty center into a recreational space, which worked sufficiently day and night, because it was given the qualities of transparency, openness, and festivity.

Figure 4.6: National Aquarium

Source: Ali Berk Pilgir [2010]

When Inner Harbor master plan was finished in 1964, it was estimated 30 years to be complete, but in reality it was completed in 20 years and three times as much developed than planned.

In 1990's the Inner Harbor was tried to be expanded into all directions; to the north they recycled mixed-use Galley project and old financial district, to east 15 acres of land turned into mixed-use, to the south residential projects were developed on former ship repair yard, and to west Oriole Park was built.

> *According to Millspaugh (April 2003, p. 40) Within the Inner Harbor area, several of the failed venues came back to life, including the historic Fish Market, converted into Port Discovery, an interactive children's museum. The most dramatic turnaround involved the former Power Plant, where an indoor theme park languished for several years before being replaced by a Hard Rock Café, a Barnes & Noble bookstore, and the first ESPN sports bar.*

Through millennium, downtown of Baltimore was rediscovered; new residential and office projects were built. The re-development of Power Plant and the addition of Power Plant Live, which is a collection of bars, clubs made the center more attractive.

Figure 4.7: Baltimore Inner Harbor Pier-6 View

Source: Google Earth [2011]

Figure 4.8: Concert Arena on Pier-6, Baltimore Inner Harbor
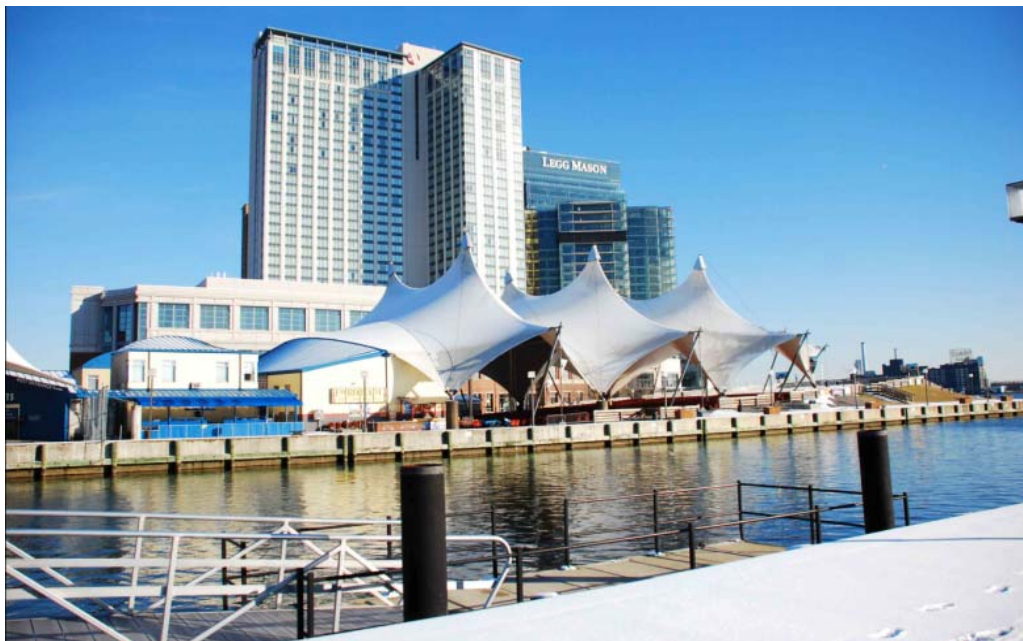
Source: By Ali Berk Pilgir [14 December 2010]

According to an observation study that was done by Ali Berk Pilgir on Friday, December 17, 2010 the journey starts near Power Plant Live, where the most of the parking lots are, and continues through the boulevard that connects the Marketplace, Power Plant Live and Children's Museum to Pier Six. This boulevard ends with a road-crossing, and after there is not such a great entrance, to the waterfront, just the promenade, which is actually the spine of the master plan that surrounds all the Inner Harbor.

Figure 4.9: Bio-Technology Building on Pier-6

Source: Ali Berk Pilgir [2010]

The facilities like Pier Six Concert Pavilion, Center of Marine Biotechnology, Pintail Yacht Charters, National Aquarium, Power Plant building, Baltimore World Trade Center, Museums, Harbor Place and some of the water-related activity centers were all gathered at north side of the Inner Harbor on the Piers.

The piers were connected to each other and to the east side of Inner Harbor, where the residential structures are, by bridges, which makes the journey around the harbor continuous and the facilities at the edge of piers more efficient.

Figure 4.10: The Bridge Connect Pier-4 to Pier-3

Source: Ali Berk Pilgir [2010]

The main entrée was thought to be on the northwest between the two structures of Harbor Place, where according to case study "The Inner Harbor Story" by Millspaugh (2003)**,** all the   attractions were gathered in**.** Even though it has a wide range of vista and it is more welcoming than the other entrées of Inner Harbor, it's not as good as it should have been.

Figure 4.11: View of Pier-4 and Pier-3
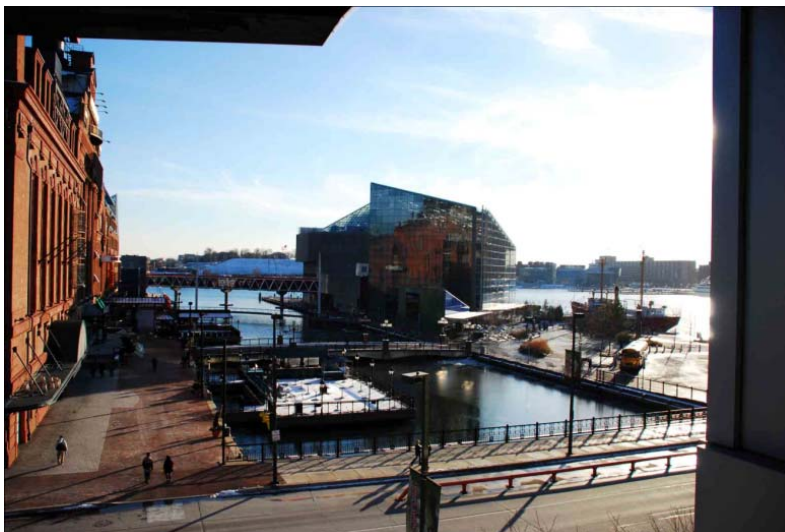
Source: Ali Berk Pilgir [2010]

Figure 4.12: Panoramic View From Pier-3

Source: By Ali Berk Pilgir [14 December 2010]

According to a photo observation study on Friday May 27 2011, the south and east entrances of the Inner Harbor have less density than the north or northwest entries. That means Baltimoreans lost their attractions, because these are the entries connecting the residential structures, Federal Park on the South and the Inner Harbor. Maryland Science Center and Harbor place are the main structures on the west section of Inner Harbor.

Between them there is an open green space, where Baltimoreans socialize. The promenade on the west section descends down to the water level with stairs, which makes easier access to boats or water taxis that also increases the relation between the promenade and the water.

Finally, waterfront of Baltimore is a story of business and political leadership coming together at such an important time and place to make especially inner harbor more attractive. The inner harbor contains resident and business facilities, aquarium, hotels, ferries, tour boats, condominiums, public art installations, nearby baseball stadium, and a Biotechnology Research Center. All these facilities are combined with brick and open promenade at water's edge for public use.

4.2 BARCELONA PORT VELL

During the extraordinary evolutionary progress of Barcelona, the relationship between city and port has constantly been one of the main factors promoting the growth, the formation, creation and promotion of the image of the city (Bruttomesso 2006, p. 23). The progress of Barcelona has been shown on the figures between 4.2.1 and 4.2.8 below.

Figure 4.13: Barcelona 1400's
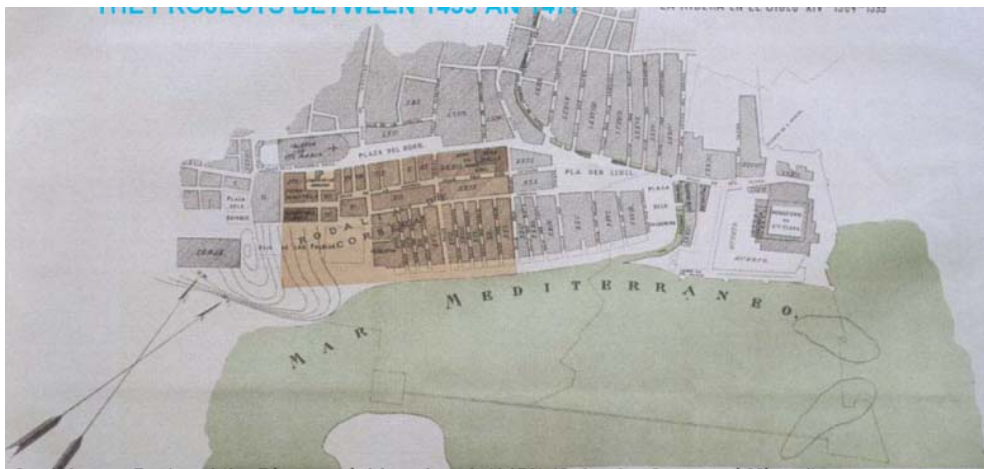
Source: Arenas, R. B., 2010. Waterfront development in Barcelona. 'Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.

Figure 4.14: Barcelona in 1700's
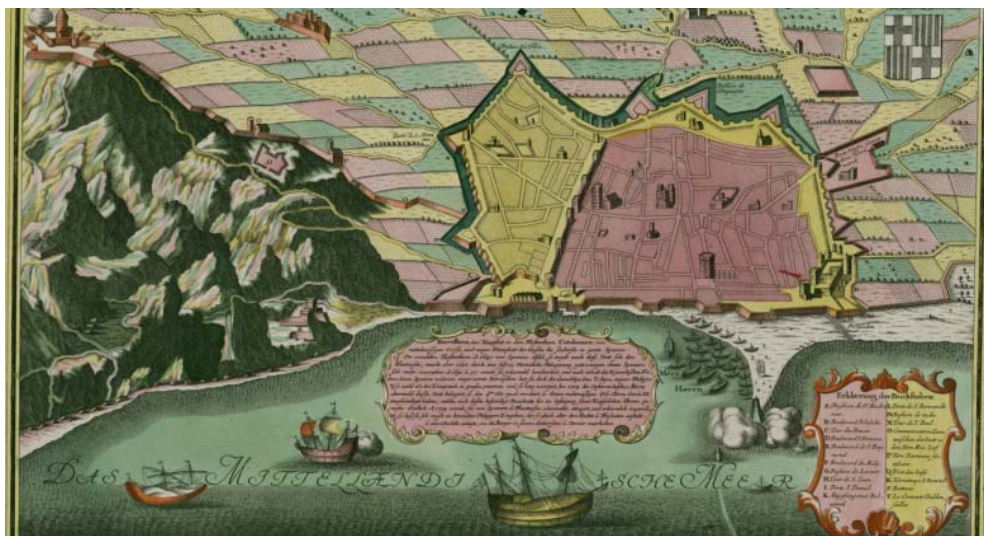
Source: http://www.pksb.com/blog/wp-content/uploads/2009/11/ba.05.jpg [2010]

Figure 4.15: Barcelona City Illustration

Source: Arenas, R. B., 2010. Waterfront development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Figure 4.16: Plan of Barcelona 1700's

Source: Arenas, R. B., 2010. Waterfront development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Figure 4.17: Barcelona in Modern Ages

Source: Arenas, R. B., 2010. Waterfront development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Figure 4.18: Barcelona In 1860's

Source: Arenas, R. B., 2010. Waterfront Development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Figure 4.19: Barcelona Port Vell in 1912

Source: Arenas, R. B., 2010. Waterfront development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Figure 4.20: Photo of Barcelona in Modernization Developments 1990's

Source: Arenas, R. B., 2010. Waterfront development in Barcelona. '*Port Vell', A new image of city, supported in the 1992 Olympic Experience and The Universal Forum Of The Cultures, FORUM 2004.*

Barcelona is an old city that was built by the edge of the sea, accordingly it has long coastlines and waterfronts, which had encouraged the city to have a long-standing relationship with ports as it can be seen on the above pictures. This port status of Barcelona caused its coastlines being occupied by containers, freighters and cranes for a long time before the re-development. Port Vell is located within the port of Barcelona and it is at the edge of the Old City.

Bruttomeso (1991, pp.33-34) says that the Port of Barcelona activities have grown parallel with the development of industry and trade in the port's hinterland, by keeping pace with technological changes in transport and cargo handling. To provide shelter for

the loading and unloading operations of ships, the Port of Barcelona has taken on a new role as being the centre for the distribution of goods. In order to distribute these goods the railroad network was increased, which caused the land of Port Vell being cut off from the pedestrians, therefore there wasn't any real relation left between the city and its port.

According to Martire (2008, pp.26-32), after 1900's, growth in the city was focused away from the waterfront, and went further when the highway was placed near the water, cutting it off from the rest of Barcelona and making it a polluted site.

According to Martire (2008, pp.134-136) and to Bedford (2001, p.6), Port Vell was a run-down area of empty warehouses railroad yards and factories. But after the renewal program for Olympic 1992 it became the focal point of the city and tourist attraction. For creating a better connection between the city and the water, it also contributes with an artificial beach, which sand continually must be imported was built next to Port Vell (Charleswort 2005, p. 36).

According to Bruttomeso (1991, p.35) a very important aspect should also be emphasized at this point, and that has the key role of Barcelona's Port; is to lead in the development of the city by the remodeling of Barcelona's maritime facade. The major work carried out in the Paseo de Colôn, the reconstruction of the Bosch I Alsina Quay and the Coastal Ring Road, open up the port to the city and made it as a seaward looking city.

Even though the renewal of the old port had been decided in early 80's, the removal plan of the industrial port started after mid 80's and forced it out to the Delta, which was on the west littoral. And the abandoned industrial zone turned into urban port (http://www.raco.cat/index.phpmm/Waterfront/article/viewFile/214686/284978　11 October 2011).

According to Martire (2008, p. 27); Technological advances in transport by handling and storage of goods have affected the Port of Barcelona. New areas have been built to comply with the new requirements. The Port had extended south, to the detriment of the oldest part which is also the one most closely linked to the historical centre of the city: Port Vell.

As it has been told above, the purpose of transforming Port Vell was to recreate the connection between the city and water by creating an urban space that would strengthen this connection. These improvements in Port Vell made the waterfront turn into a public space for leisure.

According to Marshall (2004, p.47) the city's plan for 1992 Olympic Games changed the way Barcelona's relation with the sea. For creating a better pedestrian connection to the waterfront, highway was taken underground and Bosch I Alsina was turned into a charming space, where people would want to spend time.

On the other hand, one of the great successes of Port Vell is that it is easily accessible to many people from a major pedestrian link that brings people down to Christopher Columbus Monument and then into Port Vell. The construction of the underground highway has another advantage; according to Charlesworth (2005, p.36), "Underground highway made possible to integrate the Olympic Village into Barcelona's fabric", other than making the access easier from La Ramla to waterfront site. The double benefits are not limited with the underground highway, because by reorganizing the railroads, sewage and water infrastructure for Olympic Village, they made the Port Vell come back to live.

Most important reason of Port Vell come back to live is, La Ramblas was linked to it. As according to Remesar (2004, pp.6-7), the La Ramblas, which is one of the oldest and most famous boulevards in the world, is the link that connects city to the waterfront. This link is the center of downtown activities and creates a great entrée to Port Vell, a harbor development of restaurant, nightclubs, parks and other activities. It is connected to Port with a bridge, which is called Rambla Del Mar and it functions as a gate, which

is one of the major definitions of a waterfront; pedestrian bridge, a gathering area, a place to lounge as well as stage for illegal venders. This pedestrian bridge 200 m. long, with a central span that can be moved so as to allow yacht and leisure craft to go in and out through the National Basin. It was designed to bring pedestrians close to the water via the non-fenced decking.

According to a photo observation study that has been done by Sarah J. Costisch in 2008, people usually take their time to stop for the scenery, relax and socialize on the bridge. For making the journey continuous for the ones who don't want to get stuck in a stopping crowd, the pedestrian walkway was elevated, which also provides a better point of view for scenery. Another highlight is that many people are trying to establish a connection with the water by dangling their feet over the edge of the bridge, lying over the wooden deck to lounge or to sunbathe. For proving more private spaces than public area, there are glass panels on the bridge to create intimate spaces. On the far side of the Rambla Del Mar, at the very end, decking comes to a point and slopes down into the water for marina functions.

According to a photo observation study that has been done by Sarah J. Costisch on Sunday, October 26, 2008, Sunday 1.30pm-4.30 pm is the prime time period of the week on Port Vell. Because activities like sailing, rowing and "Sunday Series" racing take place along with eating, sunbathing, shopping, going to the aquarium or a movie on Port Vell.

Bruttomeso (1991, p.37) suggests that, the Espana Quay is thought to be the focal point of activities in renovation of the port. It's planned to be a sea centre as well as conference, exhibition, recreation and leisure centers. Outdoors, people would able to enjoy mime shows, juggling acts, concerts and a whole program of combined leisure and cultural activities, planned for this wonderland.

The Espana Quay, close to the major Barcelona thoroughfares of the La Ramblas and Via Layetana, is an ideal spot for a complex marina. It's also planned to connect the end of the Espana Quay with the beginning of the Bosch I Alsina Quay. This connection

affords an easy access to passengers from the La Ramblas and the Mol de la Fusta promenade links to the rest of the Port Vell, and helps create a continuous stream of visitors across the whole area.

If it's been considered that the waterfronts are the cultural reflection of the settlers through the city, we shall agree that all the public spaces like the waterfronts should have cultural facilities as well as social spaces. When Port Vell in Barcelona is exercised, it can be seen that it is surrounded by many cultural facilities like; museums, public sculptures, and an aquarium. The museums are the facilities that are articulated with the cultural level of citizens. It symbolizes the main but the initial step through cultural fortune. In Barcelona, there are two museums that only serve for the waterfront, Port Vell. They are La Miranda Del Museu d'Historia de Catalonya and the Maritime Museum.

As addition, the street sculptures show us that the culture level of the citizens that is higher than the general. Because the sculptures are articulated with fine arts, which only serve for good tasting people. It symbolizes the success of the fine art schools, which are also located near by the Port.

The night and the leisure life was setup in the facilities like bars, nightclubs and etc, which are located around the marina. They support the 24-hours alive space and encourage the attraction on itself.

On the other hand Barcelona Port Vell still has a commercial port, so it has combined the public space for the city and the income oriented transportation base without interrupting each other.

Figure 4.21: Barcelona Commercial Port

Source: http://www.portstrategy.com/__data/assets/image/0004/185602/Barcelona_Port.jpg [2011]

4.3 SHANGHAI EXPO 2010

Figure 4.22: Shanghai Expo 2010 Ariel Illustration

Source: http://map.expo2010.cn/expoen/ [2011]

Figure 4.23: Shanghai Expo 2010 China Pavilion 2010

Source: http://static.panoramio.com/photos/original/40282052.jpg [2011]

Shanghai is a port city that was located on the eastern part of China. In 17th Century, it became one of the most important ports of Yangtze Delta region, so the bunds' popularity and importance has increased.

The developments on the bund, the increase of the population, easy transportation made the bund turn into a industrial zone after 1950's. These industrial developments and the old infrastructure systems made the Huangpu River to get polluted, which caused the relation between the city and the people being cut off.

On the other hand according to UNEP (2010) after 1990's Shanghai has been growing rapidly, but after 2000's the developments focused on sustainability in every section of city life circle. Accordingly re-treating the Huangpu River's polluted water was a must for the re-development processes in Shanghai, which lead to Shanghai Expo 2010 to focus on sustainability.

In Shanghai Expo 2010, the advances in sustainable design and experimental examples like livable cities, sustainable urbanization, and also protection and utilization of

historical heritage as well as new building technologies was exhibited (Vandenberg & Zhou 2010).

According to Shanghai Bureau of World Expo Coordination (2010), expo's master plan focuses five environmental aspects; water, air, soil, energy, and materials, so the wind and solar energy and reduction of pollutant emissions are thought to be ideal to be applied for this project and also unlike Baltimore and Port Vell, Shanghai focuses on landscape architecture and purpose of focusing on the landscape is to create an ecological corridor along the banks of Huangpu River to bring the city back to it's river and make Shanghai a waterfront city like the old times again.

According to United Nations Environmental Programme Report (2010), there are five segments, which are classified by their ecological functions and characters:

i. Waterfront green space
ii. Green space for activities
iii. Ornamental green space
iv. Green space along the streets
v. Green space on plazas

When the distribution of plants was planned, the usage during and after the expo kept in mind. Shibo Park, Houtan Park on the eastern riverbank and Jiangnan Park on the western bank are parks that created green belt along the river, and also have effect on the ecological water treatment for polluted water of Huangpu River.

As addition to landscape architecture there are several technologies like rain water collection, solar energy generation, LED lightning, natural ventilation and eco-friendly materials, which are the basis of the new trends in building design, for creating a more sustainable space. This sustainability list also includes some extreme examples like, using the semi-cleaned water of Huangpu River as the air conditioning of Expo Performance Center (Vandenberg & Zhou 2010).

As a contrast to Baltimore Inner Harbor and Barcelona Port Vell, the whole site of Shanghai Expo 2010 that is in enormous size compared to other two, is not exclusive of traffic, but only the parks are. Allowing traffic in expo site required some pre-cautions in order to keep the air pollution as low as it can be. Accordingly the only public transportation system that is allowed is fuelled with clean energy. Underneath the expo there is a subway connection that is working with electricity.

On the other hand there are also some differences in planning of this site other than allowing traffic in the expo site. Unlike Baltimore Inner harbor and Barcelona Port Vell,

there are residential structures that are called Expo Villages, in the expo site rather than being connected to them.

Figure 4.24: Plan of Shanghai Expo 2010

1-Shibo Park

2-Houtan Park

3-Jiangnan Park and Plaza

Figure 4.25: Shanghai Panorama across the Bridge

Figure 4.26: Main Public Space and Port of Shanghai Expo 2010
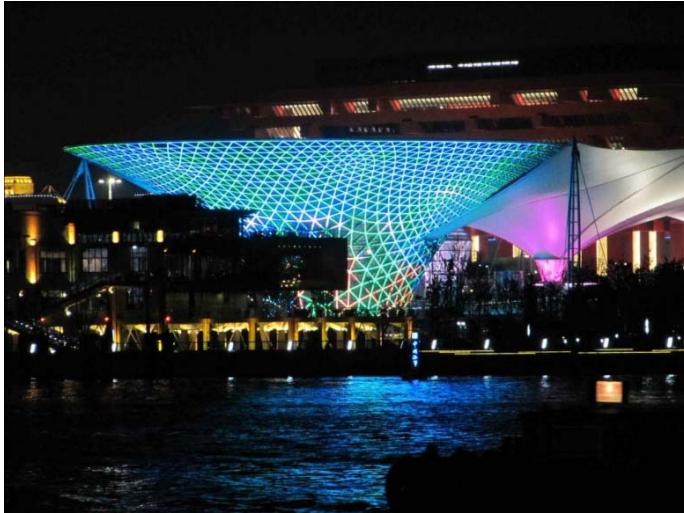
Source: http://static.panoramio.com/photos/original/42139941.jpg [2011]

Through the design there were five segments in public space design, which, were also classified by their ecological functions and characters: waterfront green space, green space for activities, ornamental green space, green space along the streets and green space on plazas. When the distribution of plants was planned, the usage during and after the expo was in mind. Shibo Park, Houtan Park on the eastern riverbank and Jiangnan Park on the western bank are parks that created green belt along the river, and also have effect on the ecological water treatment for polluted water of Huangpu River.

Shibo Park

Figure 4.27: Shibo Park

Source: http://www.turenscape.com/upfiles/1276400292.jpg [2010]

As addition of transporting the semi-cleaned water to the Expo Center, Shibo Park has many promenades, which allow people to explore the waterfront. Actually Shibo Park is

the starting point of expo parks where people can abandon the technologies, the structures in out-standing architecture, and focus on recreational spaces.

Unlike the other parts of expo site, parks have fewer structures that were articulated with experiencing the waterfront better. One of them is the traditional Chinese folding fan shaped, semi circle park divide into segments, which were formed by groves. Between the segments of this structure, for providing fresh air and supporting a great view of the river, are kept open. The underlying landscape layer, which runs parallel to the water shoreline, is composed with new design of curved lines, which are adjustable to different water volumes.

Figure 4.28: Shibo Park
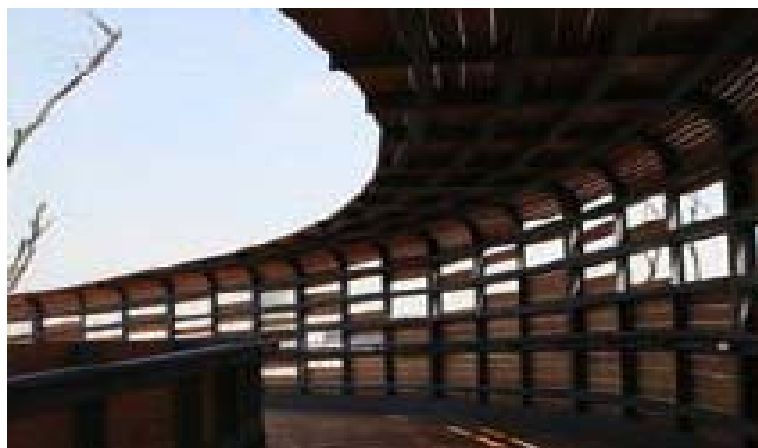
Source: Dong, N., Zhang, L., Ruff, S., 2010. From Expo City to Sustainable City. *Topos.* (70)

Figure 4.29: Shibo Park

Source: Dong, N., Zhang, L., Ruff, S., 2010. From Expo City to Sustainable City. *Topos.* (70)

Figure 4.30: Shibo Park

Source: Dong, N., Zhang, L., Ruff, S., 2010. From Expo City to Sustainable City. *Topos.* (70)

Figure 4.31: Shibo Park

Source:
http://v2.cache4.c.bigcache.googleapis.com/static.panoramio.com/photos/original/58841757.jpg?redirect_counter=1 [2011]

Figure 4.32: Shibo Park
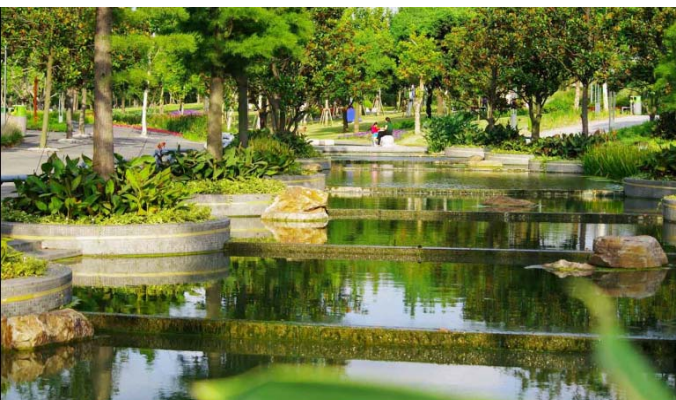
Source: http://static.panoramio.com/photos/original/59702047.jpg [2011]

Houtan Park

"Houtan Park challenges people to go beyond the misconceptions and realize the power of natural landscapes as performance spaces that are vital to a healthy environment for nature and humans." (http://asla.org/2010awards/006.html 2010).

The biggest contrast to the most of the build waterfront developments is the Houtan Park, which divides itself into living landscapes, and being converted from a brown field. This site had served as a former industrial site and turned the riverbank from mud into a natural purifying facility that actually contains wetlands and aquatic plants. When these used together, they have many positive effects like ecological flood controlling, reclaiming the negative effects of former industrial structures and materials, improving urban agriculture and water treatment. And these positive effects of rehabilitation of the site had to be integrated into the waterfront project in an aesthetic way.

Figure 4.33: Houtan Park Before Renovation

Source: http://www.turenscape.com/english/projects/project.php?id=443 [2011]

Figure 4.34: Houtan Park After Renovation

As more detail, the green space design in Houtan Park has three main aspects; biological water purification, flood control, and cultural notion of water are achieved in park's biological purifying facilities, which required existing wetlands to be widened and separated into two segments that are located parallel to the river. The first segment is formed out of reeds to clean river water, which would seep through. Second segment is an artificial wetland, in which semi cleaned water flows into the Shibo Park, which is located next to Houtan Park and be a part of landscape design.

This park is a showcase of the ecological infrastructures, which can serve more than a single service for the nature, society by new methods in water treatment and flood control (http://www.griffith.edu.au/__data/assets/pdf_file/0004/278833/Yu-Regional-Outlook-Paper-28.pdf 11 October 2011).

Table 4.1: Water Refinement Scale

02 The water cleaning mechanism of man-made wetland
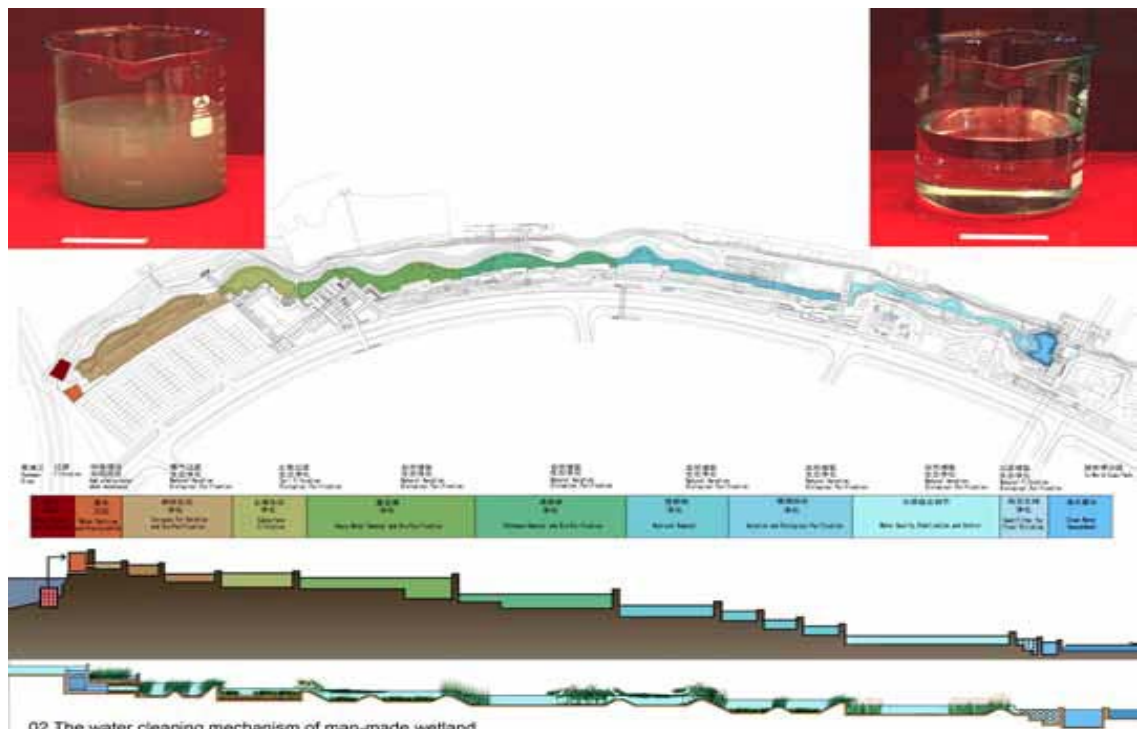
Source: http://pull.imgfave.netdna-cdn.com/image_cache/1290300961946806.jpeg [2011]

The flood control was achieved in Houtan Park by using 30 meter wide, 1 mile long artificial wetland strip containing aquatic plants that refine the water by re-oxygening. This system can cleanse up to 50.000 gallons of water from Grade V to Grade III by using half a million dollars less (Zhou & Vandenberg 2010, p. 2).

The designers created a sustainable design approach in Shanghai Houtan Park by integrating river water into the Expo Center as a heating and cooling medium for a hydro-thermal heat pump. The site also uses rainwater collection, wind-energy generators and solar collectors to offset the energy needs of the Expo (Vandenberg & Zhou 2010).

Figure 4.35: Houtan Park

Source: Dong, N., Zhang, L., Ruff, S., 2010. From Expo City to Sustainable City. *Topos.* (70)

The tides were a great problem here, to solve the problem they had fitted terraced landscape, on which the agricultural fields with different corps were planted, to revitalize traditional Chinese agriculture and to allow visitors to experience the events. For making them experience, the promenades in this park circulate through the agricultural fields and looks like more of a trail on bridges, but it is the best way to explore the park, since the water is not pure yet. But there are railings to limit the relation of the people with water.

Figure 4.36: Houtan Park and It's Promenade

Source: http://static.panoramio.com/photos/original/44898292.jpg [2011]

Figure 4.37: Jiangnan Park and Plaza

Jiangnan Plaza and Park

Unlike Houtan Park and Shibo Park, Jiangnan Plaza-Park is located on the opposite site
of the river. In order to remind the historical importance of Shanghai's industrial era,
which is considered as a part of the cultural heritage, some of former structures were
kept and re-functioned. But on the other hand creating a better heritage with the
characteristics of rehabilitation was still in a higher priority.

As contrast to Houtan Park, creating the agricultural terraces that focused on having
more vegetation surfaces, which also would withstand flooding, was really hard in
Jiangnan Park (Topos 2010, pp. 18-27). Because the dyke needed to be relocated away
from the river, accordingly it looks more like an usual park rather than a waterfront
park. Instead of the trails like in Shibo Park, the promenades are not swinging around
wetlands. They were elevated higher level like in most of the waterfront developments
around the world to match with the multifunctional spaces (Dong, Zhang & Ruff 2010).

Figure 4.38: Jiangnan Park and It's Promanade

4.4 CRITICAL ANALYSIS

These three selected waterfront developments have different approaches for the most of the analysis sections, which shows us the variety of results in waterfront design. The critical analysis involves; locations, main ideas, accessibility, promenades, public spaces, facilities, planned size, skyline/function, tourist numbers, construction costs, marina capacity, and finally sustainability.

4.4.1 Analysis of Locations

In waterfront design the location is a criteria, which sets the architectural approach to waterfront's relation with the waterfront's and the city's development.

Even though all of them are waterfront projects, the locations and the trends made them to be different from each other. This diversity in selected locations causes differences in waterfront developments.

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Table 4.2: Baltimore-Inner Harbor's Location and City Relation
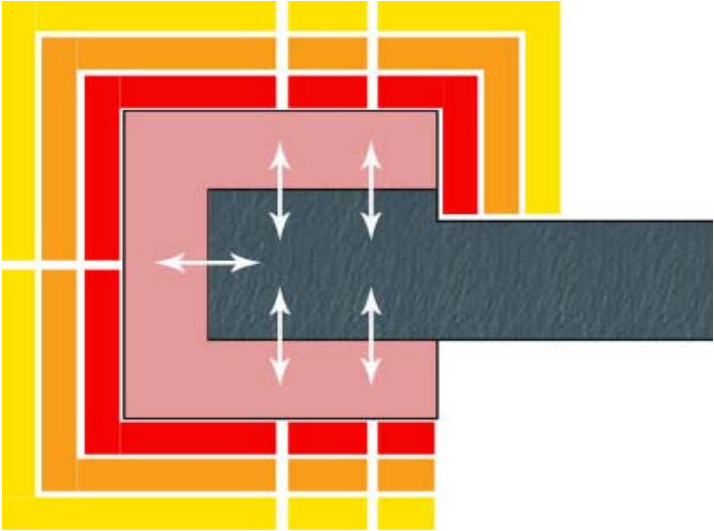
In Baltimore, Inner Harbor was located at the end of North Chesapeake Bay, which made the waterfront develop as an end point of journey. Accordingly it surrounds almost the entire harbor by the water, which makes the waterfront apart from its facilities to become the dominant as the region. That also makes the Inner Harbor to become the natural focal point of the city. Architecturally being the focal point of the city creates the possibilities for easy transportation and better land use, which connects the rest of the city better to its waterfront. It also has effects over the structures; having more accommodation, office and residential structures, bigger marina capacity, and charming facilities for getting the people into the Inner Harbor as the end point of journey.

Table 4.3: Barcelona-Port Vell's Location and City Relation
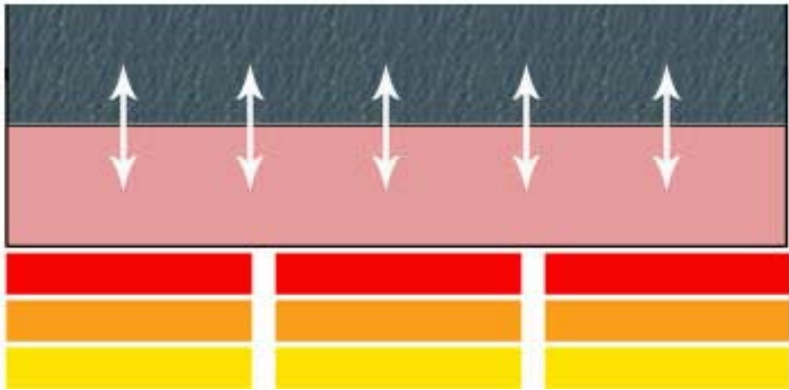
In Barcelona, Port Vell was located by the Mediterranean Sea, creating a border as a line between the city and the water. When the sea is compared to river, it serves more route alternatives than the river. Since as naturally it has longitudinal alignment, the key points started to stay apart from each other through the expansion. For avoiding the connection loss and in order to make Port Vell more a controlled area for reducing the effects of the sea, they have created a harbor. This controlled environment became the artificial focal point of the city, which also made possible, marina to be built. But here the facilities become the dominant factor unlike Baltimore and Shanghai, where the regions are the dominant factors in waterfront design. By the reason of being the border as a line reduces the connection with the city in grade. For avoiding more connection loss it serves more for residential, cultural, accommodation, commercial facilities and gathers people for longer time period.

Table 4.4: Shanghai Expo 2010's Location and City Relation
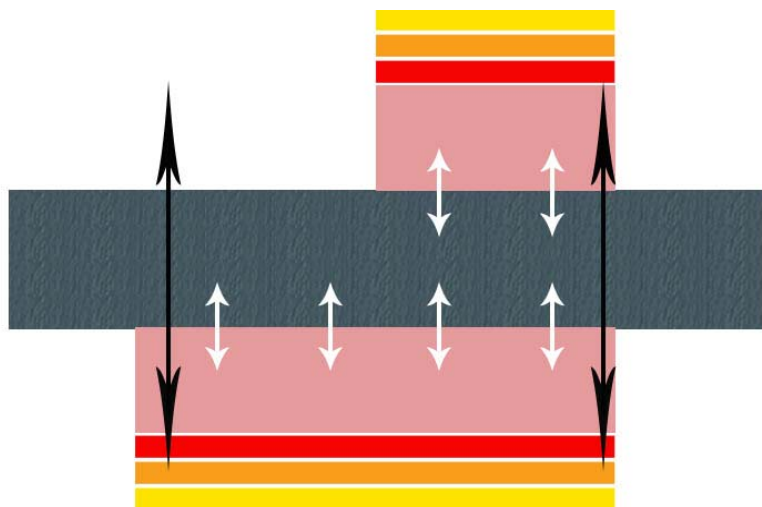
In Shanghai, Expo 2010 was located by the both edges of Huangpu River. Using the opposite sides of the river makes this waterfront to become the natural controlling space on the river flow, even though it also has longitudinal alignment like Port Vell. It contributes with the rest of city in both sides of the river. Accordingly it becomes the natural focal point of the region. Both sides of the river was connected through two the bridges, but water transportation opportunity was not used effectively. As architecturally it has more potential for easy transportation and better land use, which tie
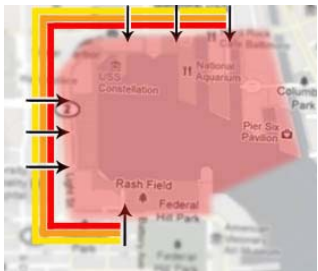
the rest of the city better to its waterfront. It serves more for office, accommodation, recreation and residential structures.

When all three are compared the best connection with the city regarding to just locations criteria is the Baltimore, because it has the most amount of land in the walking distance to the waterfront, which also increases the accessibility, the use of waterfront and land use for facilities.

4.4.2 Analysis of Main Ideas That Shaped The Designs

In this part, goals that three selected waterfront designs will be determined;

Table 4.5: Main Ideas

Baltimore: • Public use of the water's edge exclusive of traffic. • Continuous building cornice lines to create a harbor frame. • Emphasis on view corridors to link the city to the harbor	→ Public interest → Connecting the downtown to waterfront visually → Abandoning old Site → Connecting downtown →Connecting new planned urban areas
Port Vell: • Relocating the commercial port to meet the new requirements. • Removing the boarders between the city and it's water. • Connecting Olympic Park to the waterfront.	
Shanghai: • Sustainability considerations. • Development and demonstration of green technologies and eco-design. • After the expo leaving a green legacy for citizens of Shanghai and contributing to worldwide initiatives of making cities more sustainable.	→ Applying Green Technologies in order to create sustainable settlement

As it can be seen above, Baltimore and Port Vell have similar design concepts, because Baltimore has inspired Port Vell. They both tried to convert industrial sites into public

use with removing the boundaries between the city and the water. Creating a public space for citizens got also the attraction of tourists, which made these waterfronts more popular and being achieved more than expected.

But after 2000's this archetype model of Baltimore couldn't respond well for the necessity of the cities as it was. Accordingly new trends occurred to respond those needs.

When Shanghai Expo 2010 was designed, architects selected the sustainability as the concept of the waterfront. They focused on developing the "green spaces" as much as they can by using all the available technologies. Since this was an expo using all the technologies might seem like just an exhibition but in Shanghai it is more than that. Because all the components of infrastructure was re-installed using green materials, wetland areas with aquatic plants were created to refine water ecologically for the future of the city.

Yet it is unknown if Shanghai would be successful like Baltimore or Port Vell, but all these three projects were trying to create a better future for the cities.

4.4.3 Accessibility

The less time that was spend between the downtown of the city and the waterfront represents how well the waterfront is connected to the city. It is preferred to be in walking distance, which would reduce the necessity of area in or around the waterfront that would be used for car parks. As it can be understand from the charts, Baltimore and Port Vell are more connected with their downtowns according to transportation durations.

Table 4.6: Access Scheme from Downtown to Baltimore Inner Harbor

	By walking	7 minutes
	By car	4 minutes
	By public transportation 5minutes	
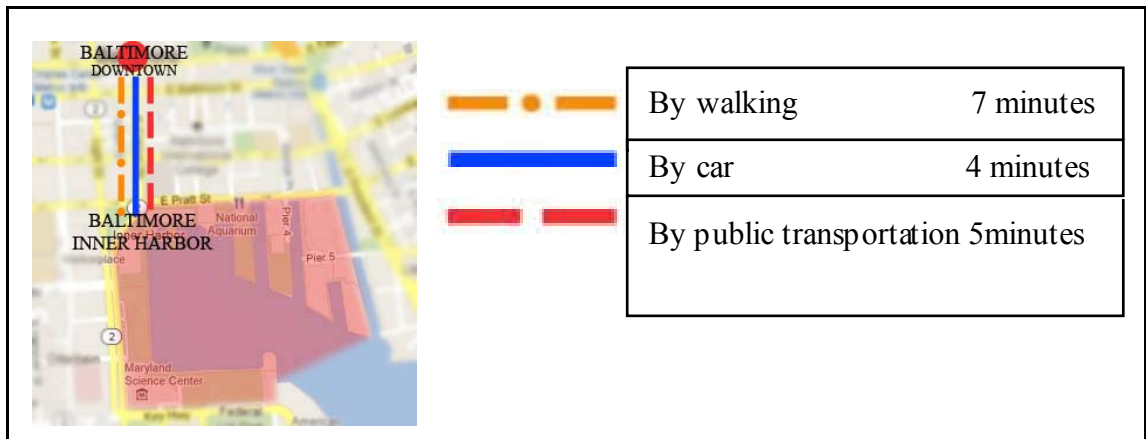
Table 4.7: Access Scheme from Downtown to Barcelona Port Vell

	By walking	22 minutes
	By car	7 minutes
	By public transportation 5minutes	
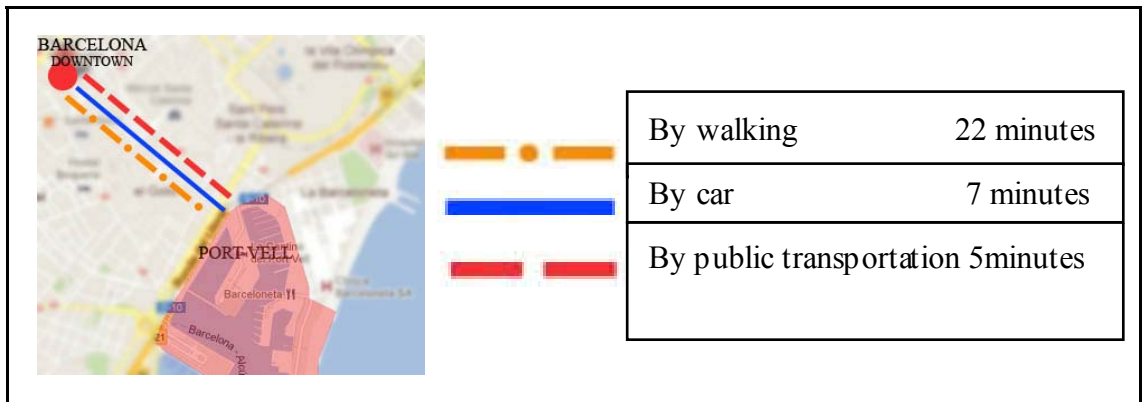
Table 4.8: Access Scheme from Downtown to Shanghai Expo 2010

	By walking	150 minutes
	By car	17 minutes
	By public transportation 48minutes	
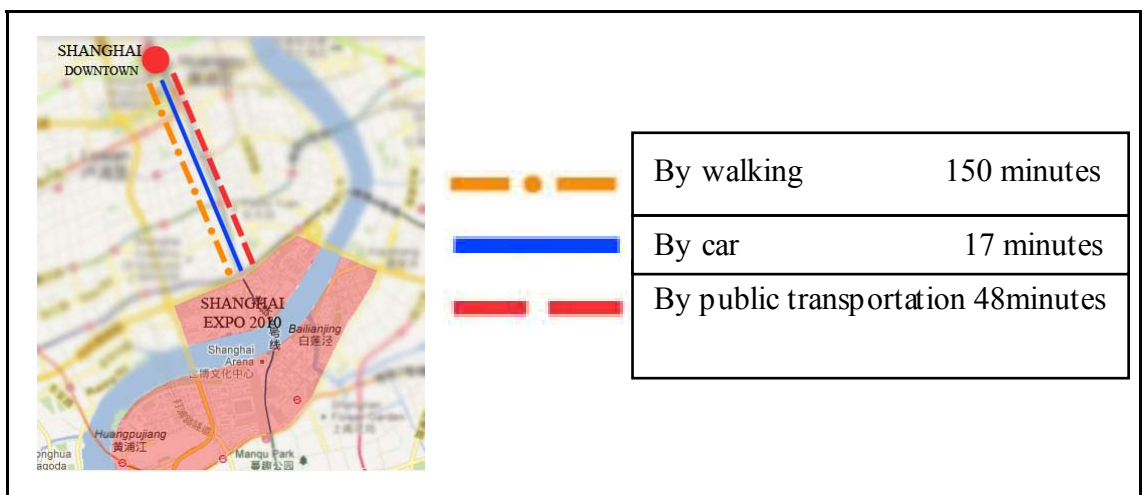
On the other hand entrees are also considered in accessibility section.

Table 4.9: Baltimore Inner Harbor Main Entrée and Public Space
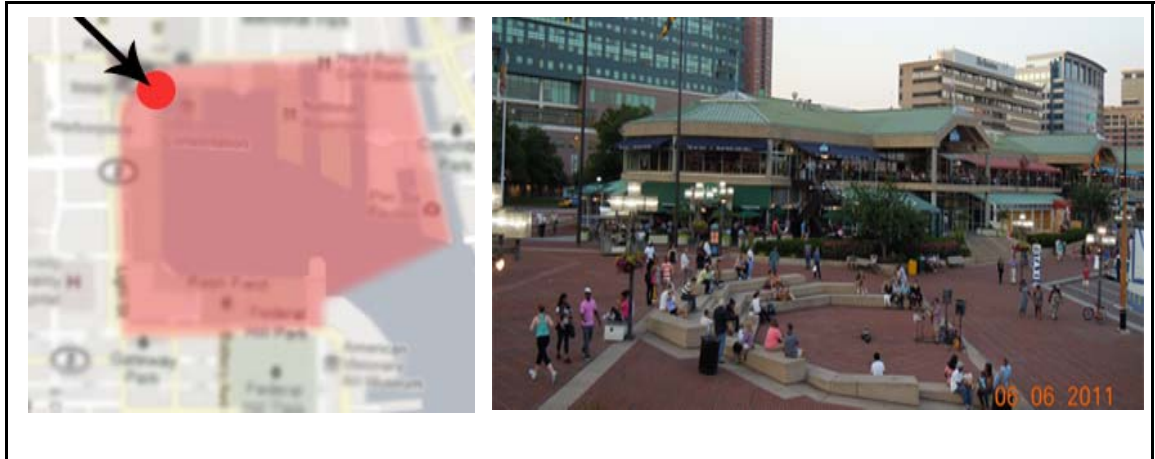
Baltimore Inner Harbor's main entrée on the northwest of the harbor settlement is different than the others in master plan. It focuses on the open space, which is located between the flagpoles and stairs through the water. And then it connects to the main vista of the Inner Harbor. Although Inner Harbor is the most important asset of Baltimore, since this was designed for public use in 1960's, it does not have a flashy entrance, which would have become a landmark of the city. In order to make the entrance more prominent, open space had to be a focal point that is surrounded by the Harborplace structures, which are the main activity gathering spaces in harbor. This open space connects the entrée to the promenade that is at the edge of the water, which is also the spine of Inner Harbor project.

As a contrast approach, Barcelona, Port Vell connects to the open space that is called Bosch I Alsina first rather than having an entrée at the beginning. Since Bosch I Alsina is located between the Rambla Del Mar and El Rambla, it becomes more of a joint point, which decreases the density of the Rambla Del Mar in a positive way. This approach makes the Rambla Del Mar to become also the gate, which was emphasized by stepping on a bridge; also means stepping into another dimension. And it becomes one of the modern landmarks of Barcelona.

Table 4.10: Barcelona Port Vell Main Entrée and Public Spaces

Table 4.11: Shanghai Expo 2010 Main Entrée and Public Space

On the other hand gate is where Shanghai Expo 2010 comes into live. Because as the entrée it has connected the gate, open space and the projection of the main promenade to each other in order to control ticket offices, but unlike Port Vell, Shanghai Expo 2010 emphasizes the entrance with outstanding architecture of gate rather than using different mediums.

If the sizes of these entrances are in compare, Shanghai has the big lead, but if the efficiency is the comparing criteria, which is the more important for waterfronts, Port Vell should have the lead, because it had integrated the entrée, the gate, the promenade, and the public space with the water and the promenade better than the others.

In other words, Shanghai Expo 2010 and Port Vell's main entrees became the landmarks of the cities, because they offer more than just public space entrances like Baltimore's that can be found anywhere else in the world.

Another criteria in accessibility is the ratio between the number of entrees and the total waterfront size. It explains how well the waterfront is connected to the city. In these selected waterfront projects there are many entrances to site in order to keep the waterfronts well connected to the rest of the city.

Table 4.12: Scheme of Variety of Entrances in Baltimore Inner Harbor, Barcelona Port Vell and Shanghai Expo 2010

Baltimore has several over ground entrees as the extension of city links to the main promenade. Even though Port Vell has several entrances to the waterfront site, it has fewer entrees, which are directly connected to the main promenade.

As a contrast Shanghai has fewer over and underground entrée ratio compared to its size. Since this is an expo site for now, there are ticket offices at the entrances so unlike others people have to pay for entering the site, which is limiting the use of public recreation spaces in this waterfront.

On the other hand, these three projects also have entrees by the sea, but the most preferred one is in Port Vell, because Barcelona is also a stopping point of cruise tours.

Finally, in the comparison of these three waterfront projects Shanghai is the least and Baltimore Inner Harbor is the best-connected waterfront by criteria of accessibility in the selected three.

4.4.4 Analysis of Promenades

The promenade, which is also the key and common element in waterfront design, has one of the most important roles of waterfront's success. It connects all the facilities, water and the city to each other, so a well-designed promenade should keep the waterfront alive.

Table 4.13: Baltimore Inner Harbor Promenade Picture and its Diversity Sections
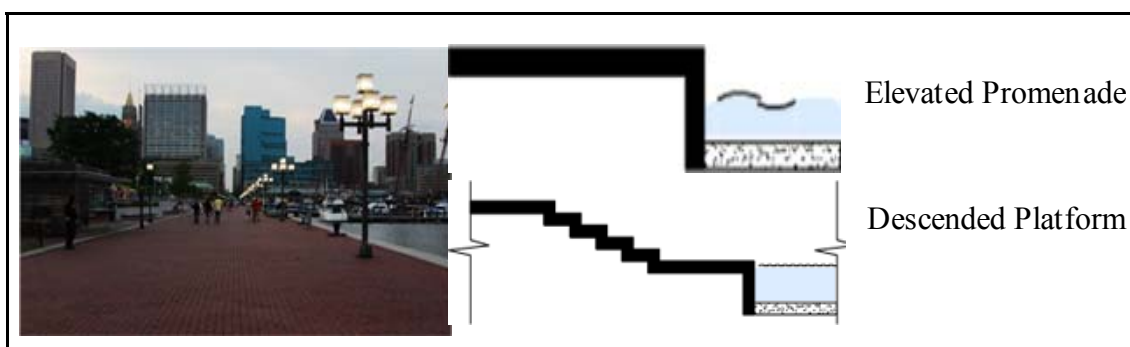
In Baltimore the promenade is the spine of the project, because it surrounds all the water's edge through the whole harbor. It is an elevated walkway as it can be seen in the graphic above. The connection is limited to a scenic view of harbor for the most of the parts, but at the northwest and southwest parts there are staircases, which levels down to the sea level in order to create platforms for people to enjoy the water better. They can sit on those staircases for even a better view or they can get on a water taxi or a boat quite easily and fast.

Port Vell has a different approach; here promenade-bridge becomes a multifunctional space on sea. It is elevated like Baltimore's, but unlike Baltimore's it is not surrounding the whole water's edge. It is brief and efficient. It levels up even more for a better scenic view and for creating more intimate spaces beside, where people can enjoy their

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time on and for functional purposes near marina the promenade levels down with a ramp, which makes harder to sit on, in order to make it easier getting on the boats.

Table 4.14: Barcelona Port Vell Promenade Picture and its Diversity Sections
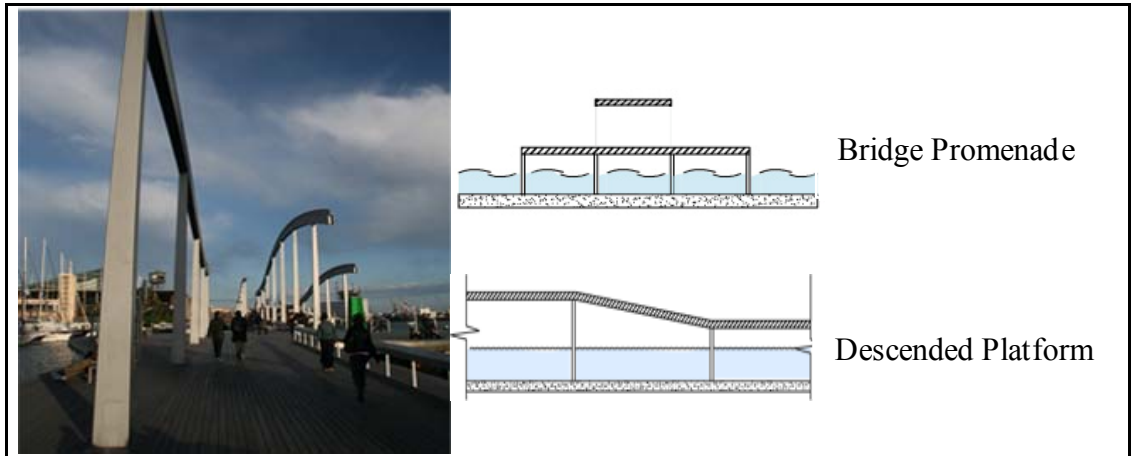
Table 4.15: Picture of Jiangnan Park Promenade and its Section

Table 4.16: Picture of Houtan Park Promenade and its Section
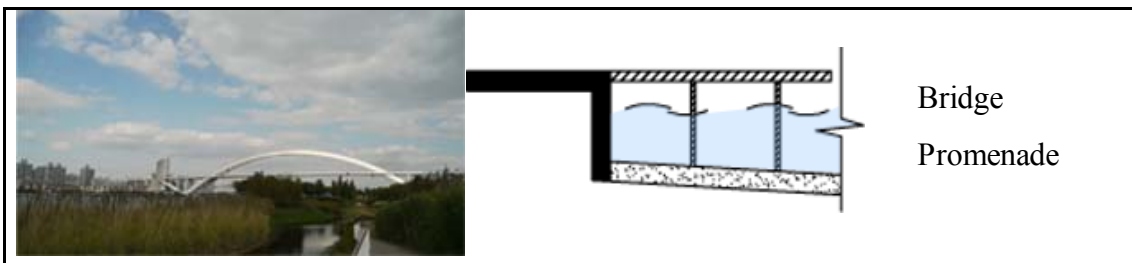
Table 4.17: Picture of Shanghai Expo 2010's Main Promenade

No Connection With Water → Main Promenade

On the other hand Shanghai has plenty different types of promenades. The ones in Houtan Park are like a trail that was elevated from the sea level. Since the trail is so long, it evolves into open spaces, where people can rest and enjoy the scenic view. But by the reason of railings attached to this promenade, even here people can never really connect with the water. The promenade at Jiangnan Plaza and Park is similar to one in Baltimore; they are both located on solid surface and being elevated from the sea level and has no railings in order to keep the correlation with water. But as a contrast main promenade was designed from a totally different point of perspective, which has nothing to do in a waterfront site.

4.4.5 Design of Public Spaces Analysis

Public spaces divide into two main groups; first one is hard surfaced, the second one is the soft surfaced public spaces.

4.4.5.1 Analysis of Hard Surfaced Public Space

Figure 4.39: Baltimore Inner Harbor Public Space
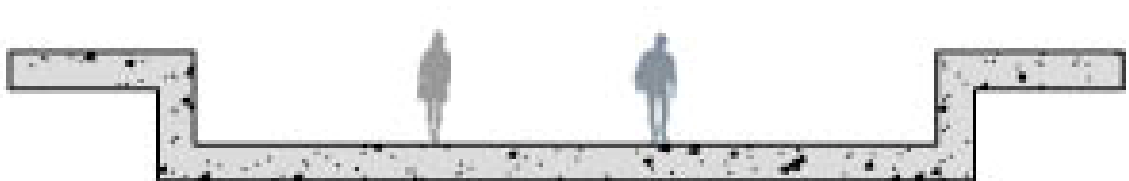
Promenades and gathering areas are the key, common elements and also the focal points of waterfronts, because gathering areas attached to promenades for creating resting spaces where people can experience the beauty of the harbor and socialize. Baltimore has two main gathering areas; the first one is at the main entrée as it has already been explained above. The second one is between Maryland Science Center and west Harbor-place. This space is elevated for serving a better scenic view of the harbor and for creating a separate space where people can sit on stairs or on benches, play on lawn or socialize, from the promenade.

Figure 4.40: Barcelona Port Vell Public Space
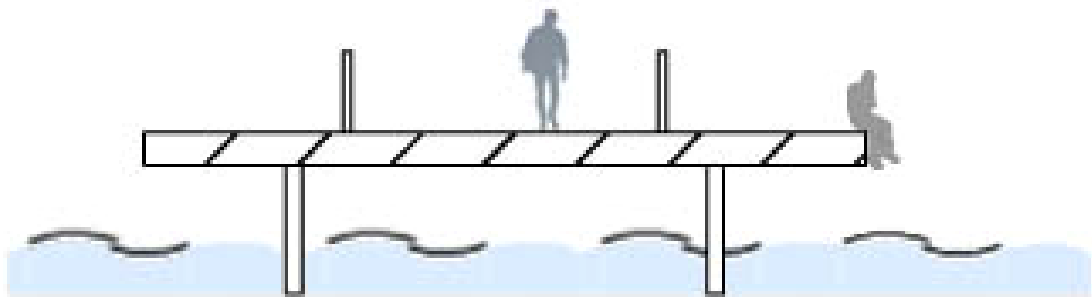
Rambla Del Mar is also the main gathering space in Port Vell, as well as it is the promenade and the gate. Here the elevated promenade separates itself from the gathering space, which remains at the same height level to keep the correlation to water. Here the transparent panels create more intimate small spaces, which allow people to socialize easier, unlike Baltimore and Shanghai's big gathering spaces.

In Shanghai the main public spaces are so big that they become undefined by the reason of their sizes. Even though there are also small public spaces on the promenades, this time they are as many as for a density like 70 million people per 6 months period.

Figure 4.41: Shanghai Expo 2010 Public Space
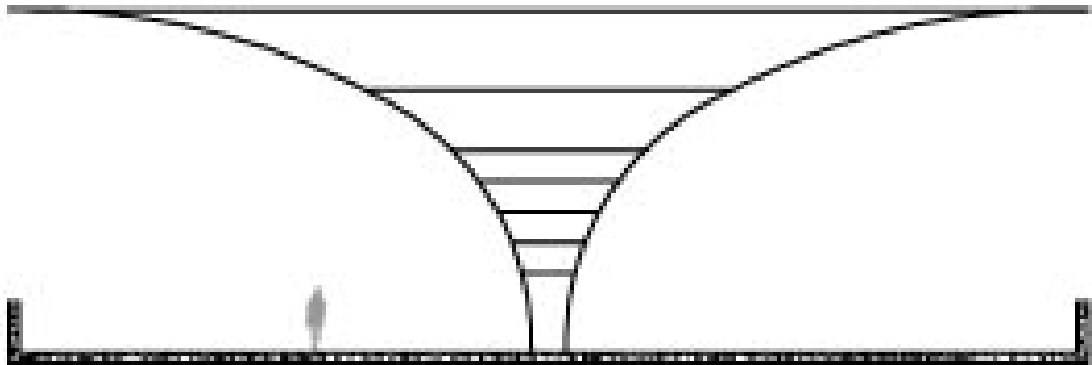
4.4.5.1.1 Analysis of Soft Surfaced Passive Public Space

Table 4.18: Baltimore Inner Harbor, Barcelona Port Vell, Shanghai Expo 2010 Soft Surfaced Passive Public Spaces Schemes

As it can be seen on the figure above, there are passive soft surfaced public spaces that include; lawn surfaces, shading areas and wetlands, in the selected waterfront developments.

In Baltimore Inner Harbor this soft surfaced passive public space is on Pier 4, it was built as the garden of Charter Yacht Club and it does not have any purposes rather than appearing beautiful.

On the other hand, Barcelona Port Vell has the some shading areas that were created with trees on hard surfaces on Bosch I Alsina promenade.

As a contrast Shanghai Expo 2010 has wetlands containing aquatic plants, which refine the water in Huangpu River, but it does not have any function for recreation of people other than appearing beautiful.

4.4.5.1.2 Analysis of Soft Surfaced Active Public Space

According to official statements, Baltimore- Inner Harbor has 7 acres of green space in the project site, but it is located at the end of marina, away from most of the entrees to site and also away from all of the activities and facilities. Because of that reason it has never been really in site.

Figure 4.42: Green Spaces Effecting Baltimore Inner Harbor

On the other hand Barcelona Port Vell does not have any parks or wetlands in the "Port Vell" project site. But Port Vell is a part of a bigger development process. In that development, Port Vell is well connected to Parc de la Barcelonetta, Parc de la

Ciutadella, Parc Zoologic and Olympic Park. Accordingly for the designers there was no need for further park developments in Port Vell, which was not a right decision.

Figure 4.43: Green Spaces Effecting Barcelona Port Vell

As the contrast, one of the biggest aims of Shanghai Expo 2010 is to integrate the parks with the sustainable design//green architecture. Houtan Park is the biggest park in expo site beside Shibo and Jiangnan Parks.

Figure 4.44: Green Spaces Effecting Shanghai Expo 2010

The charts below shows the ratio between green space connected to the waterfront and the total size. Even though one of the main ideas in Shanghai Expo 2010 project is "green spaces", it has a lower ratio of total area/green space than Baltimore. And Barcelona, but the efficiency of green spaces is a different story.

Table 4.19: Ratio Schemes of Green Spaces to Developments' Total Sizes Baltimore Inner Harbor, Barcelona Port Vell, and Shanghai Expo 2010
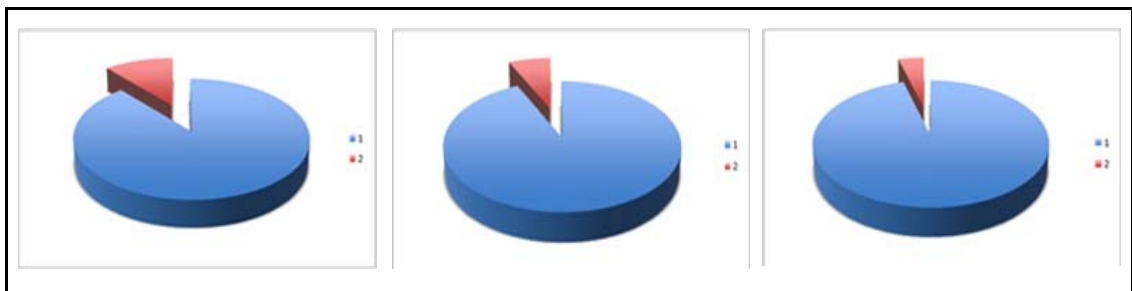
Source: http://www.gbc.org/news/2008/ [2011]
http://www.turenscape.com/english/projects/project.php?id=443 [2011]

In efficiency comparison Shanghai has more to offer than just usual parks like urban agricultural spaces for the visitors. Even though one of the main ideas in Shanghai Expo 2010 project is green spaces, it has a lower ratio of total area/green space than Baltimore. Accordingly it has to be said Baltimore is a better recreational project, but the efficiency of green spaces is a different story.

In Baltimore the green space is an usual park that is located on the southeast part of Inner Harbor. From the northern and western part of the harbor, where all the activities and facilities are, it is not easy to notice the park, because it was blocked by the marina, so it is possible to say Federal Park is not well connected to the rest of Inner Harbor.

On the other hand in Shanghai, Shibo, Jiangnan and Houtan Parks are tried to be integrated with the pavilions that are the cores. But still the huge distances in site creates lots of problems during the integration process, especially in Houtan Park. Even though it has well designed promenades by the water that take the visitors into a greener dimension with panoramic views of "developing Shanghai", getting there for a brief time is a problem, which makes it a purpose that visitors have to spend a lot of time

rather than just relaxation. Accordingly it might be said that it is not working as efficiently as it should be, but still better than Baltimore Inner Harbor and Barcelona Port Vell.

Table 4.20: Comparison of Park Sizes
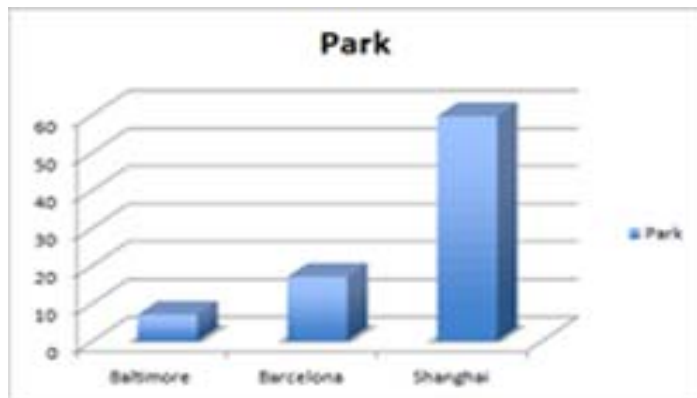
Source: http://www.gbc.org/news/2008/ [2011]
         http://www.turenscape.com/english/projects/project.php?id=443 [2011]

The figure on the left explains the amount of wetlands the Shanghai Expo 2010 has. Wetlands with aquatic plants are important for refining water as well as creating green space. Refining the water quality encourages people to connect better with the water and keep on using it. This refined water also used in the structures for creating more self-sustainability.

Persistence of natural water refinement instead of using artificial refinement bases would remind people that waterfronts are supposed to be nature based spaces as well as reducing the amount of structures and costs.

4.4.6 Analysis of Facilities

Table 4.21: Chart of Facility Comparison

	Baltimore	Barcelona	Shanghai
Water Related Activ	+	+	-
Parks	+	+	+
Multifunctional Spac	+	+	+
Self Sustainablity	-	-	+
Green Buildings	-	-	+
Water Refinement	-	-	+
Port	+	+	+
Beach	-	+	-
Museums	+	+	+
Edu-tainment Space	+	+	+
Commercial Space	+	+	+
Residential Space	+	+	+
Commercial Port			
Café/Restaurant/Bar	+	+	+
Accomodation	+	+	+
Office	+	+	+
Marina	+	+	-
Convention Center	+	+	+
Trade Center	+	+	-
Aquarium	+	+	-
Cinema	Imax	Imax	Pavilion
Shopping Center	+	+	-
Stadium	+	+	-
Biotechnology Institute	+	-	-
Science Center	+	-	-
Audotorium	-	-	+

In the chart on the left, all the facilities over the years in the waterfront development projects and the ones, which are connected well to the waterfront, are given. A well-designed city-waterfront should have the variety of facilities for every section of life circle and also have to balance the income and the expenses. According to the chart, there are plenty of common facilities in those three projects, but there are also differences, which represent the advances in waterfront designs.

+   -   Baltimore and Port Vell are more focused on the daily facilities and recreation of visitors where Shanghai is more focused on sustainability. Even though Shanghai is the newest, the most of the gathering spaces are not well efficient like Baltimore's, by the reason of their huge size. The variety of facilities that can be seen in the chart above, encourage the way the city would develop, so architecturally they have the influence

over the design of the total connection between any structure in or around the waterfront.

During the redevelopment Shanghai Expo 2010 and Baltimore Inner Harbor was discarded the ports, but in Port Vell the commercial port was relocated nearby so it still has the commercial bases, which would keep the waterfront alive.

If all these three projects are compared as the efficiency of the facilities to total size, it can be said Baltimore and Port Vell have the same success rate in facility correspondence to environment.

4.4.7 Analysis of Planned Area Size In Urban Development

Table 4.22: Chart of Size Comparison
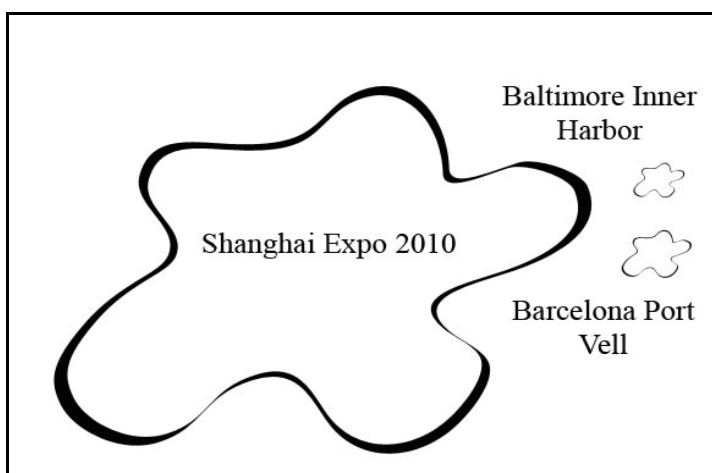
The size of the waterfront developments should be related with city's dimensions and present green, recreation spaces related to their size. These examples are selected to clarify the results in different volumes. As it can be seen in the figure on the left, Shanghai Expo 2010 is eight times bigger than Barcelona Port Vell and 10 times bigger than Baltimore inner Harbor. Even though Shanghai Expo 2010 has a huge size, it soes not offer a bigger success than Baltimore Inner Harbor and Barcelona Port Vell, which has similar sizes.

4.4.8   Skyline / Function Diversity

Figure 4.45: Skyline of Baltimore Inner Harbor

Figure 4.46: Skyline of Barcelona Port Vell
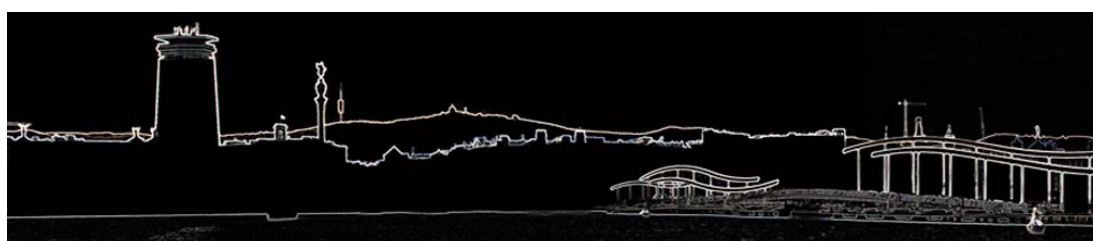
Figure 4.47: Skyline of Shanghai Expo 2010

Skyline is one of the representation criteria that might/should help to identify the variety of spaces in waterfronts developments. A well-developed waterfront should have the diversity in height of structures rather than having an uniform height level at the background, which also would not block the scenic view.

In Baltimore, there are several high structures, but as general there is a variety in structure heights; symbolizing the diversity in their function. These differences in height levels set a rugged skyline, and also emphasizing the waterfront.

As a contrast, in Barcelona most of the buildings are low-story, which helps to identify Edificio Colón that is the only high structure nearby. This uniform height levels decrease the number of facilities surrounding the waterfront. Even though the necessity

in sizes of facilities is lower in Europe when it is compared to United States, the variety is also lower compared to Baltimore. But since the height level is so low, it visually connects the inner city better.

In Shanghai, the most of the structures are high as the contrast of Port Vell. Accordingly the skyline, which was set by many high structures at the background, represents the less variety of facilities surrounding the waterfront as it can also be seen from the analysis of facilities section.

As conclusion, the most respectful one for the environment is the Barcelona. In Baltimore high structures have a clearer viewing range, but in Shanghai even though the structures are higher than Baltimore they don't have any better viewing range, because they are blocking each other.

4.4.9 Analysis of Tourist Numbers

Number of tourists is an important aspect that has positive effects over the success of the waterfronts. When the numbers increase, the necessity in accommodation facilities, transportation alternatives also increases, which means the city has to develop more. The second advantage is the expenses for the development of the waterfront can be gained from the tourists, which would encourage the investors. Even though the expenses for Shanghai Expo 2010 are so high, it covers up these expenses by huge lead in the number of tourists.

Table 4.23: Chart of Tourist Numbers
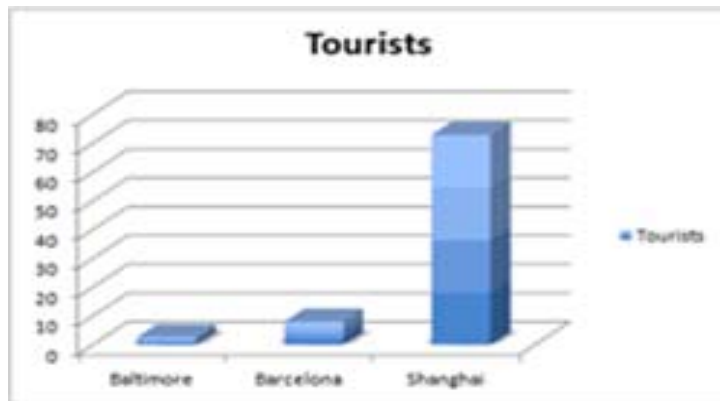
Source: http://www.barcelona.ie/port-vell/ [2011]

http://articles.baltimoresun.com/2010-06-03/news/bs-md-co-smith-summer-tourism-

20100603_1_local-tourism-industry-new-tourism-campaign-baltimore-county [2011]

http://www.nytimes.com/2010/11/03/world/asia/03shanghai.html?pagewanted=all [2011]

4.4.10 Analysis of Construction Costs

Table 4.24: Chart of Consruction Costs
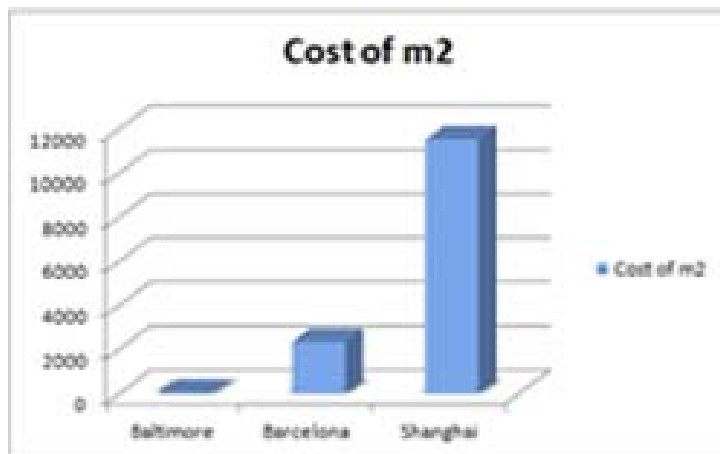
Source: http://globalharbors.org/inner_harbor_story.html [2011]
Caldentey, E., 2008. 20 Years managing el Port Vell de Barcelona.
http://www.constructionweekonline.com/article-10012-shanghai-expo-cost-60b-ten-times-
original-budget/ [2011]

The construction costs represent how much was spent for the waterfront for each square
meter. The expenses in Shanghai Expo 2010 are really high compared to other two
projects, because all the infrastructures were replaced with green technologies because
the transformation was not limited to over ground structures and the connection to each

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other. Green infrastructure, generating electricity via solar PV-panels, refining river water via wetlands and using it in air conditioning systems in structures, using green components in construction process with outstanding architecture increased the total cost, but also decreased the utilization costs.

4.4.11 Marina Capacity

Figure 4.48: Marina of Baltimore Inner Harbor
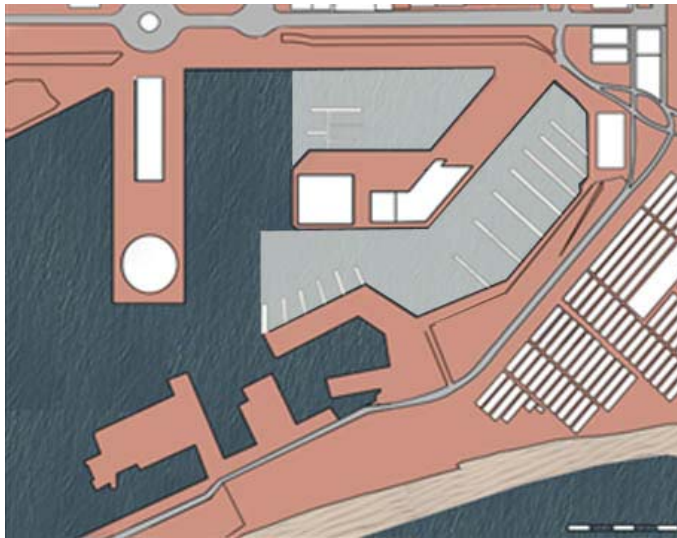
Source: Ali Berk Pilgir [2010]

Figure 4.49: Marina of Barcelona Port Vell

Source: Ali Berk Pilgir [2010]

The marina capacity represents how well the people are connected to water-related activities by using that waterfront. As it can be seen Barcelona Port Vell has the lead in the marina with 360 boat capacity and also the number of water-related activities. Baltimore Inner Harbor has 278 boat capacities and Shanghai has none.

4.4.12 Sustainability

Table 4.25: Annual Solar Energy Generation Diagram
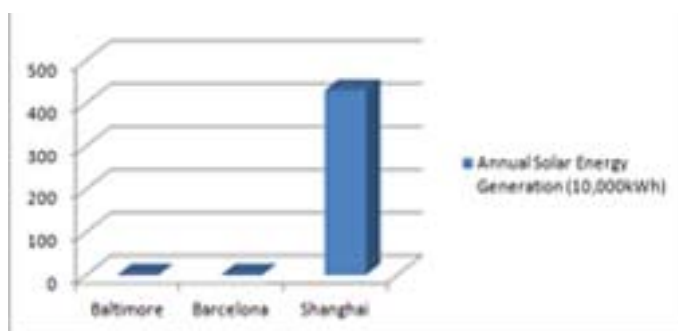
Source: Dong, N., Zhang, L., Ruff, S., 2010. From Expo City to Sustainable City. *Topos.*

Sustainability is one of the most important trends in today's world. Creating a sustainable waterfront means; using technological achievements for consuming less, using natural possible solutions for existing problems and preserving heritage. During the developments of these selected waterfronts, preserving heritage was a common point, because with museums or design details remind people the former developments on the watefront site. But re-functioning the former structures can only be seen in Shangha Expo 2010. On ther other hand, in Barcelona Port Vell and in Baltimore Inner Harbor, there is no green technologies or natural solutions to reduce the negative effects.

As a contrast Shanghai Expo 2010 can generate electricity via PV solar panels and combine it with green LED-lighting system that would increase the self-sustainability of the waterfront. It uses the semi-cleaned water that was refined by ecological ways by aquatic plants, in HVAC systems to reduce the water usage from the city grid. And for

preserving its plus sides, also green infrastructure systems were used to decrease the negative effects to ecological balance, which encouraged the whole city to develop itself in this route.

5.   CONCLUSION

5.1 CONCLUSION OF CRITICAL ANALYSIS

After the analysis of three selected waterfront developments, it's clear to see the improvements in some sections. The diversity in approaches makes it hard to conclude, which one is better. But it also allows us to see the results of different approaches in waterfront design, which was the purpose of this thesis.

After analyzing the locations, it can be said, the waterfronts should have a controlled inner area for becoming dominant feature as the region, independent of it's facilities. Otherwise it would be tried artificially by building a harbor in order to become the focal point of the city. These controlled environments increase the land use ability, which can be seen in Baltimore Inner Harbor. Even though it is the smallest in planned size, by the reason of Baltimore Inner Harbor's unique surrounding shape, the amount of land that was connected to waterfront was more in ratio than the others.

On the other hand in accessibility analysis, it is hard to see the improvement. They all use the usual transportation systems and multiple entrées. Through the years the ratio of amount of entrees per the waterfront's size decreased, which also caused the decreasing problem in connection with the city. In accessibility section only improvement that can be said, is the green public transportation system in Shanghai Expo 2010. But actually best solution would be, constructing such an important waterfront closer to the city's downtown. The time duration from downtown to waterfront with car transportation is reasonable, but by public transportation or by walking it is not well connected and after getting into the waterfront site in Shanghai Expo 2010, more problems can be observed.

The site is 1305 acres, which is such a big site for usual waterfront development. Accordingly it was impossible to make the whole site exclusive of traffic. Unlike Baltimore Inner Harbor and Barcelona Port Vell, which are about 10 times smaller than Shanghai Expo 2010, the cars or over ground public transportation systems can be used in the site. In order to avoid the accessibility problems for pedestrians that would be caused by this allowed traffic, the bridges were constructed like in Barcelona Port Vell and Baltimore Inner Harbor; but the difference is they have those bridges before entering the site rather than in the site like Shanghai Expo 2010.

As a contrast to Shanghai, transportation is one of the best features of Baltimore Inner Harbor. Since it surrounds the three edges of harbor, it is closer to the most of the parts of the city than Barcelona Port Vell, which as topographically formed as a line.

Although Baltimore Inner Harbor still has its piers, which should have negative effects over the integrity of the waterfront facilities, they do not cause longer roads, but creates alternative perspectives through the journey. As these piers were connected to each other with bridges that also increased the efficiency of the facilities, which were located through the edge of the piers. In Barcelona Port Vell for increasing the accessibility, the highway was taken underground, some links were connected over "Ronda del Litoral" with bridges to Bosch I Alsina and all the links of Barcelonetta can merge into Port Vell. Even though Port Vell has accomplished these achievements, since its main promenade "Rambla del Mar" is narrower and also more crowded than Baltimore Inner Harbor's, it can be concluded that Baltimore is better in accessibility than the others.

Even though having more entrees to waterfront site increases the accessibility, being able to reach the promenade on the water's edge or to a main public space right after passing through these entrees is far more important for identity of waterfront. As it can be seen in the analysis, all three selected waterfronts have many entrances. But Baltimore Inner Harbor has created the best relation between main entrée and main public space, because it was designed in the right scale at the right location.

On the other hand Barcelona Port Vell has a different kind of entrance that combines the promenade, public space and the landmark of the city all together, but because of the scale it becomes too much crowded. Shanghai Expo 2010 has also an entrance that combines public space and landmark of the city, but since it's such a huge space it became undefined and out of scale. Being so different from the human scale makes it a contrast to two other waterfront projects.

As it has been said above Shanghai Expo 2010 is 8 times than Barcelona Port Vell, and more then 10 times bigger than Baltimore Inner Harbor in planned size. When it's been thought Baltimore Inner Harbor and Barcelona Port Vell are successful in their 8-10 times smaller sizes, it is hard to say waterfronts should be as big as Shanghai Expo 2010. It is preferred them to be as compact as possible without sacrificing any improvements.

But on the other hand new movements need more space for wetlands and aquatic plants in order to refine the water naturally and restore the ecological balance. So referring to Shanghai Expo 2010's ratios, the usual sized waterfronts like Baltimore Inner Harbor should gain %10 more space in order to achieve that goal.

Even though Shanghai Expo 2010 is the newest, according to the analysis it can be concluded it is lacking of number and variety of facilities. A well-designed waterfront project should have enough number of facilities and activities. Most importantly, the ones that are related with water should be included in the project, which the Shanghai Expo 2010 does not have. As a contrast Baltimore has many water-related activities, but best of three is Barcelona Port Vell. Even though it is artificial, it has a beach and also many shoreline activities for public use, addition to Baltimore Inner Harbor's features.

From the beginning it was the main idea to create a sustainable waterfront, accordingly soft surfaced public space is where Shanghai Expo 2010 has the advantage. In order to achieve that goal, they had created three parks in the waterfront site for multi-functional use. Aquatic and agricultural plants on the shoreline have the water-refining feature and

they deal with the negative effects of the tides, unlike Baltimore Inner Harbor and Barcelona Port Vell, which have just usual parks or lawn areas for recreation. On the other hand, independent from the efficiency perspective in soft surfaced public spaces, the ratio of green space to total planned waterfront area is also important, where Baltimore Inner Harbor has the lead. But Shanghai's waterfront development has not finished yet. They are trying to convert most of the Expo site into a waterfront development that is illustrated in the below picture. And this is one of the biggest reasons why Shanghai Expo 2010 was included in this thesis.

Figure 5.1: 1Illustration of Shanghai Expo 2010 in the Future

Source: http://map.expo2010.cn/expoen/ [2011]

Although refining water is an important aspect in sustainable waterfront design; it is not the only one. Using efficient "Green Systems" in infrastructures, public lightings, HVAC systems and generating electricity via solar panels, wind or hydro tribunes are also important. These features can only be seen in Shanghai Expo 2010 in the selected waterfront developments.

Preserving the heritage is another important aspect in these selected waterfronts. All these waterfronts were converted from different kind of mono-functioned bases to multi-use waterfronts. For preserving its maritime culture and shipping industry, Baltimore Inner Harbor has museums and some ships. As addition to Baltimore, Barcelona Port Vell has many details for reminding that it was converted from a mono-functioned commercial port, it has kept its old ship cleats. On the other hand, in

Shanghai Expo 2010 the old industrial structures are kept and re-functioned for reminding that it was an industrial site.

Preserving the heritage, creating green spaces, using technological achievements to create a better environment are the components of the sustainable design approach. And it can be concluded that Shanghai Expo 2010 has the lead in this sector. Barcelona Port Vell tries to preserve its port features by some details but it does not have any green space in site and technological achievements that can be called as a sustainable waterfront design. Baltimore Inner Harbor also suffers from lack of technological and natural features to make it sustainable. And somehow during the site visits in 2010, it felt like the heritage was attached to it rather than it has been there all along.

Finally when the design concepts in compare, all three-waterfront developments have aimed to create a traffic exclusive public space and change the route of the cities' developments by connecting them to water. But Shanghai aims more than that. It was tried to convert the city into green space by using sustainable approach. Creating a better space for the city using the expo's advantages and turning this site into recreation space for locals is the biggest achievement of Shanghai Expo 2010.

5.2 WATERFRONT & SUSTAINABILITY

"Sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland Commission 1987).

> *According to Gauzin-Muller (2002, p. 255); the quest for environmental value in architecture, for a harmonious balance between man and his surroundings, is not new. For centuries, and particularly in domestic and vernacular architecture, people adopted this approach out of necessity. Since industrial revolution, it has been increasingly abandoned in favor of man's belief in his own omnipotence and ability to draw unrestrainedly on the earth's resources.*

A sustainable project, natural refining methods are outstanding in the first place. Refining creeks or anything articulated with the wastewater or storm water by natural ways is really important. But nowadays technological improvements should also help to respond the demands of the modern life style has brought into our lives, like electricity.

The upsides of using sustainable architecture are; lowering the costs, long lasting green infrastructure, better created recreational spaces, easier maintaining possibilities and most of all it helps the nature to restore its own balance, which was corrupted by human's demands. In this approach during the time nature restores its balance, it creates natural public spaces, which are really important in waterfront design, as they have been explained in comparative analysis section of this thesis.

5.2.1 Principles of Sustainable Urban Waterfront Design

Principle 1 - Secure the quality of water and the environment: The quality of water in the system of streams, rivers, canals, lakes, bays and the sea is a prerequisite for all waterfront developments. The municipalities are responsible for the sustainable recovery of derelict banks and contaminated water.

Principle 2 - Waterfronts are part of the existing urban fabric: New waterfronts should be conceived as an integral part of the existing city and contribute to its vitality. Water is a part of the urban landscape and should be utilized for specific functions such as waterborne transport, entertainment and culture.

Principle 3 - The historic identity gives character: Collective heritage of water and city, of events, landmarks and nature should be utilized to give the waterfront redevelopment character and meaning. The preservation of the industrial past is an integral element of sustainable redevelopment.

Principle 4 - Mixed use is a priority: Waterfronts should celebrate the water by offering a diversity of cultural, commercial and housing uses. Those that require access to water should have priority. Housing neighborhoods should be mixed both functionally and socially.

Principle 5 - Public access is a prerequisite: Waterfronts should be both physically

and visually accessible for locals and tourists of all ages and income. Public spaces should be constructed in high quality to allow intensive use, where it does not disturb work in progress.

Principle 6 - Planning in public private partnerships speeds the process: New waterfront developments should be planned in public private partnerships. Public authorities must guarantee the quality of the design, supply infrastructure, generate both a social equilibrium. Private developers should be involved from the start to insure knowledge of the markets and to speed the development. The coordinators of complex waterfront developments must guarantee their long-term economic, social and ecological success.

Principle 7 - Public participation is an element of sustainability: Cities should benefit from sustainable waterfront development not only in ecological and economical terms but also socially. The community should be informed and involved in discussions continuously from the start.

Principle 8 - Waterfronts are long-term projects: Waterfronts need to be redeveloped step by step so the entire city can benefit from their potentials. They are a challenge for more than one generation and need a variety of characters both in architecture, public space and art. Public administration must give impulses on a political level to ensure that the objectives are realized independently of economic cycles or short-term interests.

Principle 9 - Re-vitalization is an ongoing process: All master planning must be based on the detailed analysis of the principle functions and meanings the waterfront is concerned. Plans should be flexible, adapt to change and incorporate all relevant disciplines. To encourage a system of sustainable growth, the management and operation of waterfronts during the day and at night must have equal priority to building them.

Principle 10 - Waterfronts profit from international networking: The re-development of waterfronts is a highly complex task that involves professionals of many disciplines. The exchange of knowledge in an international network between contacts involved in waterfronts on different levels offers both individual support and information about the most important projects completed or underway. (The World Conference Urban 21 04-06 July 2000)

5.3 Creating Unique Spaces

Waterfronts are unique spaces in cities. They gather the advantages of water and land mediums in themselves for creating a dynamic space. These spaces are the natural centers of interaction and socialism of the people since the beginning. They should not be turned into mono-functional bases like it had been experienced after the Industrial Revolution as ports, industrial plant areas.

In order keep the waterfronts alive, they should have multi-functional use purposes, which would have the variety depending on its location and for keeping it alive 24/7. Accordingly turning waterfronts into multi-functional use; including more socializing spaces, is a necessity, which will also encourage the use of more soft-surfaced public areas in waterfronts where people can run from their daily concrete cages and enjoy the recreational spaces.

According to Watson and Adams (2011) the precautionary actions to increase protection of properties at risk is as follows:

    i. Stop the harm: Stop removing wetland, river, and estuarine buffers, coastal landscapes of forest, marsh, and mangroves that buffer storms.

    ii. Start doing the right thing: At any scale, begin projects that mitigate harm and protect coastal resources, increasing water and food resources.

    iii. Plan for the longer term: Planning is the costly strategy and requirement for due diligence, to assess risk and determine solutions, ready to be implemented as opportunities and needs appear.

On the other hand according to new circumstances, for keeping these waterfronts alive as public spaces, there has to be some additions for making them self-sufficient, because according to American Planning Association Planning advisory services report (2004 p. 8); *as we learn more about the benefits of protecting our natural resources, there has been a movement toward protecting natural river attributes and resorting areas that have been damaged. Natural river functions are extremely costly to replace once they are lost or damaged.*

It has been predicted; from now on the developments in waterfront design would be connected to sustainable approach in order to make them self-sustainable and socializing spaces as what they had been at the beginning. In order to create this self-sustainability in waterfront developments; wetlands and aquatic plants for natural water-refinement, wind power or solar PV panels for generating electricity, depending on the region or the design approach, but for all green infrastructures should be used.

According to Mark A. Benedict and Edward T. McMahon green infrastructure is; "An interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations." (Renewable Resources Journal Autumn 2002, p. 12).

As addition green infrastructure has many advantages like; low construction and operation costs about 1/5, easy maintaining, efficiency in wastewater treatment, lessen the impact on pollution loads, and being ecological. If they are combined with treatment trains, which makes green infrastructure to be applied anywhere being independent from centralized systems that was limiting to respond ever-changing environmental conditions. These green infrastructures can also be combined with rooftop-gardens and the vegetation of green walls, which does not require permanent irrigation, in order to avoid heat island effects.

On the other hand development of the waterfronts can not be limited to these technological achievements or just re-discovery of nature. The developments should improve themselves for creating more dynamic, but also harmonic space with the nature on the waterfronts, because they are the connection themselves between the water and the city.

In conclusion, waterfronts have developed a lot since the beginning; there have been many advances through these development processes. The advantages that it has as the dynamic space, made the waterfronts be inevitable. At some point this situation had created some profit oriented developments to seize the interaction based spaces. But

soon the importance of these unique spaces was noticed. Accordingly in the future there will be many more advances for re-developing the insufficient spaces and developments of new ones, but as much as this study has shown us, they will be more oriented to public space, nature, self-sufficiency, heritage and water-human interaction.

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