The Study of Interfaces as a Method for Urban Renewal: a proposal for Vladivostok's Downtown Waterfront

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Abstract: Vladivostok is a port settled in a strategic territory at the Russian Far East, facing the Pacific Ocean and connecting Eurasia with East Asian countries, mainly China, Korea and Japan. This dual character, being a Eastern European city located in Asia, coupled with the circumstances of its historical development, has defined a particular character expressed in its culture, architecture and urban landscape, as well as in its relation with the sea. Nested on a hilly topography on the edge of the Muravyoy-Amurski peninsula, the city overlooks an impressive seascape, combined with views of mountains and islands. With these characteristics it is paradoxical that Vladivostok has little public area where people can enjoy contact with the sea, since most waterfront areas are occupied by industrial plots, parking lots, abandoned areas or misused beaches, that coexist with a small group of interconnected public spaces, particularly in the downtown area. This paper discusses a proposal for the recovery of these areas from an academic and practical perspective. In order to enhance both the resilience to potential hazards and the development of public space for improving social and environmental conditions in the city, we propose a methodology that focuses on identifying urban interfaces, which are the areas of major exchange between different systems, and use them as catalysers for improving the surrounding areas.To this end, firstly, the paper explores the evolution of the city's relation with the sea and identifies its morphology, spatial configuration, and expressions of mental landscape. Secondly, using GIS techniques, it defines the major interfaces, which are the areas of exchange between different systems, and use them as catalyzers for improving the surrounding areas. Finally, it proposes a model for the renovation of Vladivostok's waterfront areas, by means of an integrated network of public spaces that would substantially increase the offer of public areas and improve the relation between the city and the sea from a social, economic and environmental perspective.

Key words: renovation, Vladivostok, waterfront, urban interface, public space.

Introducing the Area of Study. Geographical conditions

Vladivostok (population about 600,000) is the most important city in the Primorski Krai and the major Russian port in the Pacific, located in the southern part of the Muravyov-Amursky Peninsula, close to China and North Korea and facing Japan (Figure 1). Vladivostok is also the endpoint of the Trans-Siberian railroad, that extends to Moscow and Saint Petersburg. Developed around the Golden Horn Bay, its area of influence extends to the Amur Bay on the West, the Sea of Japan to the east and the Russky Island to the South. Stretching out over a hilly topography, the downtown

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Fig.1. Location of Vladivostok in Russia

area is presided by the Eagle's Nest Hill (214 meters). Despite its latitude (43.1333° N, 131.9000° E), equivalent to southern France or Northern Italy, the city endures very cold winters of temperatures of -20°C, as well as rainy, humid and warm summers of about 23°C. In contrast with other major Russian cities, Vladivostok enjoys relatively good insolation throughout the year (Administratsia Goroda Vladivostoka, 2014). The area of study is circumscribed to Downtown Vladivostok, as shown in Figure 2.

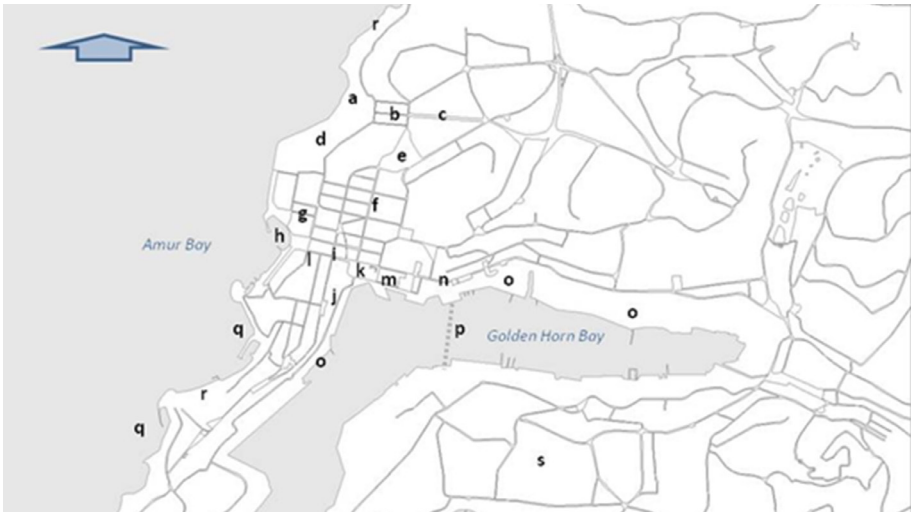

Fig.2. Downtown Vladivostok. A. Parking lot. B. Village. C. Krasnogo Znameni avenue. D. Energy station. E. Pokrovskiy park and church. F. Okeanskiy avenue. G. Dinamo Stadium. H. Sports Quay. I. Svetlanskaya street. K. Main Square. J. Railroad station. L. Okean cinema. M. New Orthodox cathedral. N. War Memorial. O. Port. P. Golden Horn Bridge. Q. Yacht Club. R. Beach. S. Churkin.

Historical Background

As a port city, Vladivostok has always been closely related to the sea, however the particular socio-political characteristics of its historical evolution have affected the development of its urban landscape. Four stages can be identified regarding the relation of the city with the seascape, (Zeballos, 2012): the formation or prerevolutionary years, the pursue of an ideological landscape, the late soviet transformation and the post-soviet development.

a) The formation years

Vladivostok began its history as a Russian military outpost to the East of the country. The city's history traces back to 1859 when Nikolay Muravyov-Amursky, General-Governor of Eastern Siberia discovered a bay (later it was named Golden Horn Bay because its long curved shape resembles a horn) that suited perfectly for establishing a port. In March 18th 1860 he issued an order to found an outpost called Vladivostok, which officially became a port in 1862. The main buildings (barracks, church, private houses and etc.) were concentrated at the northern and north-western border of the Golden Horn Bay (Figure 3). In 1868 the first city's urban plan was carried out by land-surveyor Mikhail Lubensky, according to which Vladivostok was to be divided into rectangular blocks, each of them containing eight plots. In 1870s the decision of the central government to relocate the Siberian military fleet from Nikolaevsk (Nikolaevsk-on-Amur) to Vladivostok caused a construction boom. The city's first architect, Yuliy Rego planned the construction of blocks in the first street named Amerikanskaya (later Svetlanskaya) which runs along the embankment of the Golden Horn Bay. In 1880 Vladivostok officially achieved the status of a city with a

Fig.3. Vladivostok in 1866

population of 9000 people. As 2-3 storied stone buildings started to appear, the streets got some improvements, such as lightning, pavements, etc. It is important to note that before the construction of the railway, visitors could only observe the city from the deck of a ship. According to the records of visitors the most striking feature was the unique marine landscape, the picturesque bays and havens, beautiful hills and slopes upon which the city was situated. The facades of the buildings faced south, chaotically dispersed along the bay. Russian writer Vsevolod Krestovsky noted that for the Russian eye the absence of domes of churches –typically seen in every Russian city or village- was unusual (Khisamutdinov, 2001). By the end of the 19th century Vladivostok was the main port of Russia and a military fleet based on the Pacific Ocean began to develop intensively. The most important event on the 1890s was the construction of the eastern part of the Trans-Siberian railway and commercial port. At the same time, due to the worsening of the international situation in the Far East the constructions of fortifications began (Vladivostok fortress).

The city's urban layout was organized around a street that was located parallel to the Golden Horn and the port (Svetlanskaya) and another one perpendicular to it, on the direction of the peninsula (Aleutskaya). The railway station (1894) was located on the intersection of both roads. This layout and the hilly topography would ensure visual contact with the water from most parts of the city. The integration analysis carried out on an axial map representing the city in 1906 shows that these two roads were the most integrated in the foundational grid layout (Zeballos, C. & Belushkin, M., 2011).

Fig.4. Layout of Vladivostok in 1906

At the beginning of the 20th century numerous buildings were constructed in Vladivostok, as well as a number of public gardens and parks, such as the "Italian Garden" situated in Goldobin Peninsula, the Admiral garden and the City garden. The city developed rapidly due to the immigration facilitated by the Trans-Siberian railway and the presence of people from neighboring countries (China, Korea and Japan) as well as European merchants .

This cultural heterogeneity was manifested in the city's diverse architecture and traditions that flourished until 1920. The multiple ethnicity of its population was expressed in the different districts of the city. On the other hand, the population grew from 22,000 inhabitants in 1900 to 97,509 in 1916 (47.9% foreigners), although population grew strongly during the World War the 1st mainly due to flow of migrants and prisoners of war. This exponential growth had negative effects on heath, hygiene, lack of sufficient public services, crime, etc.

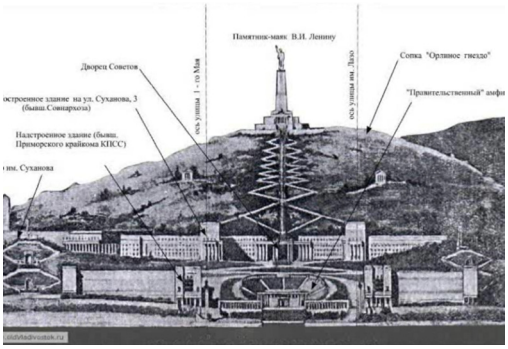

Fig.5. Waterfront monument according to Vasilev (1935)

Fig.6. The monument of the Fighters of the Soviet Power, presiding over a picturesque park in 1961-63, before it was remodeled as a dry square.

b) The pursue of an ideological landscape

The Soviet Revolution had an impact in the city, since foreigners were expelled and many religious monuments were destroyed. The Vasiliev plan (1938), a proposal that intended to transform Vladivostok into a model of Soviet city in the East, was the first attempt to relate the urban area with the waterfront. Vasiliev wrote in his records about the unique complex landscape of Vladivostok that stimulated a special and expressive architecture in the city (Vasiliev, 1937). His plan proposed a monumental axis presided by a 70 m lighthouse supporting a huge statue of Lenin that would be placed on top of the city's most prominent geographical feature: the Eagle's Nest Hill, visually and symbolically linking the city and the ocean. Aside of the monument, other facilities were proposed, such as a semicircular plaza, the Palace of the Soviets, several monuments and a thousand seat open-air amphitheater (Figure 5). Moreover, the street layout was to be changed in order to face the monument, which would have involved the demolition of large areas of the city. A bridge and two ferry lines were proposed in order to connect Vladivostok to the other side of the bay, the Goldobin Peninsula. However, all those plans were never realized due to the outbreak of World War II.

c) Late Soviet transformation

Vladivostok was not affected by the war itself, but since most of the government resources were directed to the reconstruction of cities on the West, it was neglected from 1945 to 1959. During the first postwar years Vladivostok was developed according to the 1938 plan. However, due to the increasing international tension during the Cold War, Vladivostok strengthened its position as the main military naval base in the Pacific Ocean.

For the creation of a new master plan specialists from Leningrad, leaded by architect Suvorov, were invited. This plan (1954) proposed the construction of a central square at the crossing point of the Leninskaya (Svetlanskaya) and Kitaiskaya (Okeanskii Prospekt) streets. In the centre of the square at the axis along Kitaiskaya Street they planned to place the monument of the Fighters for the Soviet Power (sculptor A.I.Teneta).

Nikita Khrushchev first visited Vladivostok in 1954 and, dissatisfied with the poor conditions of infrastructure, housing and services, promoted the city's development in a large scale. That involved the creation of new districts, the reconstruction of Vladivostok fishing port, improvements of pavement and greenery, a 400-meters high television tower was erected at the top of Eagle's Nest Hill and works for the Monument to the Fighters for Soviet Power began. After the second visit of Khrushchev to Vladivostok in October 1959 on his way back from the USA, he nicknamed the city as "the San Francisco of the East" due to its hilly topography. This governmental endorsement played a crucial role for the development of Vladivostok. In 1961 the government approved a new 20-year urban master plan, carried out by the Lengiprogor Institute from Leningrad, according to which new urban districts must be constructed and the transportation infrastructure improved, including the construction of a bridge across the Golden Horn Bay.

Urban plans for improving the city were envisioned under Khrushchev and carried out under Brezhnev, including the creation of massive housing buildings and

green areas. In this period, important public spaces commemorating the collective memory were located near the waterfront, such as the Square of the Fighters for the Soviet Power and the Memorial for War Veterans. Also, public services were improved, and facilities such as the Dinamo stadium and the Sports Quay were built in the vicinity of the coast line. Architect Vasiliev noted that despite the increment of green areas, their quality was primitive, lacking artistic expressivity. (Vasiliev, 1962).

In 1962 the first funicular in the whole Far East began to operate, allowing access from Leninskaya Street (Svetlanskaya St.) to the top of the Eagle's Nest Hill and thus affording a unique panoramic view of the city and Golden Horn Bay. In 1975 the largest sea port passenger terminal in the USSR was open. Also in 1975 a memorial museum of the submarine C-56 was established at the Korabelnaya Embankment and later in 1982 the complex was enlarged as the Memorial to the Glory of the Navy that became a place for official events. In the 1983 at the crossing of the two oldest streets of the city, Leninskaya and Aleutskaya, a 22-storeyed building -the House of the Soviets- was built, becoming an architectural landmark of the city, although contrasting with the lower scale of the urban fabric in the downtown area.

d) Post-Soviet transformation

The Perestroika had negative effect on the further development of the city as many projects were postponed or cancelled. After the dissolution of the Soviet Union, Vladivostok turned its attention to Asia once again. Previously, being a military post, even Soviet citizens had been banned from entering the city, but from 1992 visitors were welcomed again, just like at the beginning of the city's history. Along with its modernization the city has restored or rebuilt historical buildings and preserved its heritage. However, the main catalyzer has been the construction of facilities and infrastructure in order to host the Asia Pacific Economic Cooperation –APEC summit in 2012. Such important international event that took place in Vladivostok had a great influence in development of the city and made a solid base for its future growth. The most important works include the renovation of the airport, the construction of new road connecting the airport and Russky Island where the Summit took place, the construction of a bridge linking the downtown with Churkin (Goldobin Peninsula), new important facilities such as the Theatre of Opera and Ballet, the new campus for the Far Eastern Federal University in Russky Island and the longest suspension bridge in the world, connecting the city with Russky Island, which can become an important part of the city.

Social Use Of Space

The transformation of the city has also affected the social use of space throughout time. A Visibility Graph Analysis identifies three major public areas as the most integrated in downtown Vladivostok: Pokrovskiy Park, the Main Square (also known as Square of the Fighters of the Soviet Power) and the Sports Quay, including the neighboring Okean Cinema, all of them directly or visually connected to the waterfront (Zeballos & Belushkin, 2011). It is noteworthy to observe how the inhabitants make use of these spaces and particularly how this use has changed from Soviet to current times, from normal days to special holidays and throughout different seasons of the year.

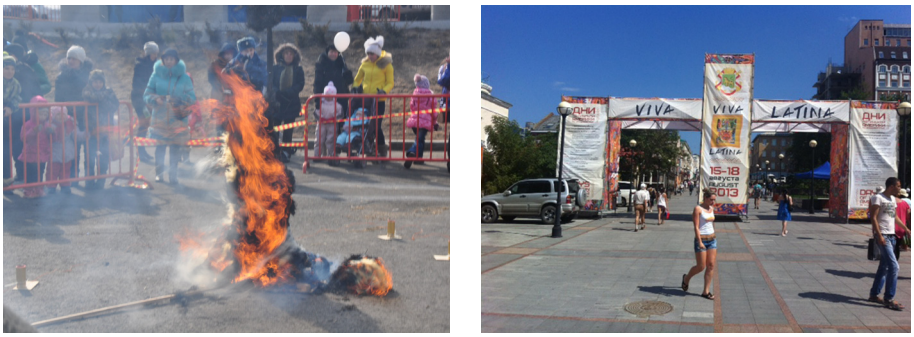

Fig.7. Social use of public space. a) Maslenitsa in winter. b) Viva Latina Festival in summer.

During Soviet times, the main celebrations were held in New Year's Eve, on Victory Day, the City Day and Labor Day. Being a naval city, big parades have traditionally taken place.

After the collapse of the Soviet Union and the reconstruction of the Pokrovskiy Chruch, religious feasts such as the Eastern Orthodox Pascha (Easter) were celebrated again, carrying out processions in the surrounding Pokrovskiy Park.

Additionally, in that last five years, new festivals, activities and events are being organized, particularly around the Sports Quay. The International Film Festival Pacific Meridian has become one of the most important international cultural events in the city. Since not long ago, the Days of Latin America in Vladivostok festival and the Viva Latina festival are popular events that take place every year during the summer, showing the local people interest about Latin American culture (Gonzalo, 2014).

While most of these outdoor events happen in the warm seasons, only two take place during winter: New Year's Day and Maslenitsa, an Eastern Slavic religious and folk holiday celebrated during the last week before Great Lent—that is, the seventh week before Easter. Due to the harsh weather, most winter activities take place indoors (Tkachev, 2014) (Figure 7).

These three main uses of space: civic, religious and recreational, will be considered as key roles in the organization of the urban proposal.

A methodological framework focused on interfaces

The proposed methodology seeks to identify the most representative and synergistic aspects of the problem in order to establish possible urban policies, programs and projects. At the same time, it intends to carry out an integrated diagnosis of the waterfront and its historical, cultural and physical-spatial context, in order to reflect the complexity of this given ecosystem.

Furthermore, this systemic approach requires a set of tools in order to understand the diverse nature of the site as well as its multiple bonds with the city and focuses on the interrelations of the problem and its context (Zeballos, 2001).

An interface is the point or area of contact between two or more ecosystems, through which multiple levels of interrelation as well as flows of matter, energy and information can converge (Pesci, 1999) .These areas concentrate the attributes of the converging ecosystems and thus they superimpose and multiply them, resulting in a

more compatible and wider characterization of the ecotone to which they belong.

From the viewpoint of communication, interfaces can be positive when they allow and cause the transmission of information, or negative, when they do not. Also, interfaces can be social or active when they have a unifying function, assuming the role of a node or institutional link, or they can be physical or passive when function as an edge or boundary between the active areas of the urban tissue they bind.

In terms of space, an 'interface' is a spatial relation between inhabitants, or those whose social identity as individuals is embedded in the spatial layout, and visitors, whose identities in the buildings are collective, usually temporary (Hillier, 2007).

The method of the interfaces is different from traditional urban planning because it focuses on key, sensitive points where the city develops. Rather than investing the great amount of time, energy and resources that customary urban plans generally involve, the efforts are focused on solving the interfaces, which are especially sensitive to the needs of people and their environment.

Also, interfaces can serve as urban catalyzers, channeling positive and controlled impacts in their surrounding areas, which in turn affect others. The concepts of action-reaction or cause-effect are integral to catalytic theory, encouraging the interaction of new and existing elements and the impact on the urban form. Catalysts are existing urban elements of value that are enhanced or transformed in a positive way. (Attoe & Logan, 1989)

Identifying interfaces

In order to identify the location of interfaces, several indicators or types of information related to the physical and socioeconomic characteristics of the area were used. Prior to the analysis, these data, available either in digital or hard copy format, were systematized, geo-referenced and rearranged in thematic layers according to the subject of research.

Each indicator was mapped and values were assigned representing their positive or negative role according to the question: "how much this indicator contributes to the development of a public waterfront area?". For example an easily accessible area obtained a positive, high value, while an area under high risk received a negative score.

The following is the list of indicators used and their corresponding sources:

- Topography : topographic map, scale 1:5000
- Slope: a SRTM 90 m Global Digital Elevation Model DEM was used in order to identify areas with a slope of less than 5 percent (DEM Explorer, 2014).
- Accessibility: adapted from an urban sensing map (2012), showing restricted and protected areas.
- Proximity to Monumental heritage: referred to buildings and monuments of historical value. Adapted from Vladivostok's zoning map (2012). The areas were given a 50 meter buffer of influence.
- Public spaces : Proximity to parks, squares and promenades. Adapted from Vladivostok's zoning map (2012). The areas were given a 50 meter buffer.
- Risk Areas : adapted from an urban sensing map (2012). While the area of study is not prone to seismic activity and it is naturally protected against

Fig.8. General map of interfaces. The darker red areas correspond to the more relevant interfaces.

tsunamis, however other risks, such as flooding , pollution and landslide were considered.

- Land use: urban areas were graded according to their functional compatibility with the proposed development.
- Visibility: using a Space Syntax visibility map as base, areas with high visibility within the urban system were located.
- Vistas: special points from where panoramas of the seascape can be overlooked were identified during fieldwork.
- Physical borders: natural (topographic) or man made barriers. For this purspose, a SRTM 90 m Global Digital Elevation Model DEM was used in order to identify areas with a slope of more than 15 percent (DEM Explorer, 2014).

Subsequently the layers were combined into a single map of interfaces. In the Figure 8 the darker areas correspond to the zones of major interfaces located in the seafront and that are suitable for intervention. Clearer tones correspond to either areas far from the waterfront or where intervention is neither feasible nor convenient.

Structuring the master plan

Defining the axes

The study of passive or built interfaces defines the location of the most sensitive areas, as well as the functional and physical characteristics of their environment. Additionally, active interfaces identify the dynamics of the socio-cultural activities in these spaces and their phenomenological perception, as well as the patterns of appropriation of public space.

The analysis of both types of interface indicates different topological relations between these areas, suggesting certain degree of affinity or specialization. For that reason these areas are grouped around three main axes that structure the Master plan for the development of the downtown and its waterfront.

a) The "civic axis" connecting spaces located in the northern edge of the Golden Horn, that hold traditional activities of celebration such as the Main Square, the War Memorial , the marine park and a children's playground area next to the port. Taking advantage of several empty areas in both sides of the Korabelnaya street, right next to the port, a series of concatenated spaces would allow continuity and articulation of these areas. On the other side, the axis extends eastwards through Svetlankaya Street until the Sports Quay, an area which houses some of the city's most important examples of architectural heritage.

b) The "recreational axis" runs parallel to the coastline along the Amur Bay and contains sports, tourist and recreational activities. It intersects the "civic axis" in the Sports Quay, an area that already contains the Okean cinemas, the Dinamo Stadium and the Razvlekatelniy Children Park.

c) The "monumental axis" runs perpendicularly to the Golden Horn along Okeanskiy Prospect, and connects the two most important public spaces in downtown area: the Pokrovskiy Park and the Main Square. It also symbolically links two religious architectural landmarks: the Pokrovskiy church and the new Orthodox cathedral under construction. The proposal includes the extension of this axis from the Pokrovskiy Park the Amur Bay.

These three axes articulate a multipolar structure that establishes a street circuit encompassing ecological, recreational activities, transportation, tourism and preservation of the urban heritage.

Improving accessibility

At this point, it is arguable whether the mere presence of these axes would ensure a fluent dialogue between the city and the sea. Jane Jacobs (1961) emphasizes the importance of accessibility to urban spaces in order to prevent them from becoming abandoned areas that promote vandalism and crime. Similarly, Hillier (2004) underlines the objective relationship between the geometric and relational structure of the urban fabric and the restrictions that they impose to movement and co-presence, as a system of barriers and permeability.

For that reason, a local integration analysis (at radius =3) was carried out on an axial map of the downtown area (Figure 9 left). The darker red lines represent the most integrated streets and the darker blue ones the most isolated. The study shows that some areas of the proposal present low integration values and would become segregated. However, this situation substantially improves by reinforcing access to the waterfront, extending the Krasnogo Znameni Prospect as well as providing transversal corridors between the city and the coastal axes. (Figure 9 right).

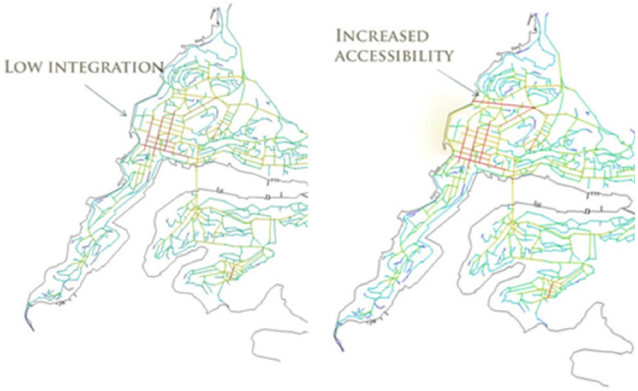

Fig.9. Integration in the coastal axis became higher after improving accessibility.

This structure is summarized in Figure 10.

Fig.10. General structure of the model: axes with access.

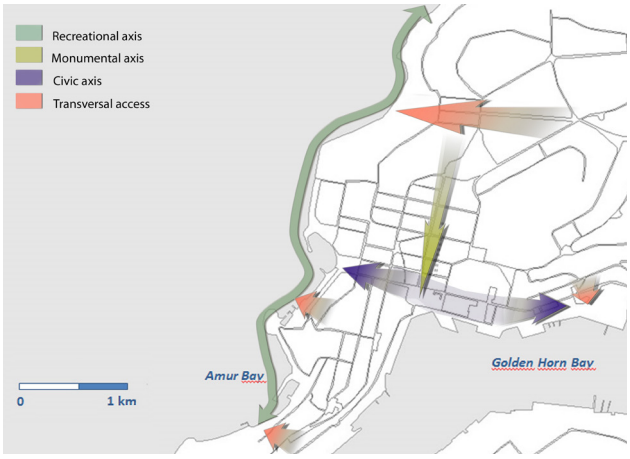

Fig.11. Spatial model

Conceiving the Spatial Model

A spatial model is a tool that arranges and integrates the different components of the urban structure, and their spatial relationships and socio cultural interfaces in order to promote a fluent dialogue between the city and the sea. Using a systemic approach (Pumarino, 1975), the proposed spatial model includes the location of key projects and interventions that could have a positive impact in their surroundings. It also takes into account the recent urban renovations as well as the historical heritage. Moreover, the plan promotes their interconnectivity through specialized axes or corridors in order to create a continuity between the downtown, the Golden Horn and the Amur Bay. The spatial model is composed of the following subsystems:

- Waterfront Metropolitan Park (Fig. 12a). Currently, this is a large semi abandoned area located of a particular geography: steepy cliffs in contact with the sea become an interruption to the continuity of the beach, then a large plateau that offers outstanding vistas overlooking the Amur Bay and subsequently a depression that enjoys a warmer microclimate and a natural protection against the coastal winds. In this polluted area, where parking lots, industrial dumps, deposits, debris and garbage coexist, a new 20 hectares metropolitan park is proposed. It would house both recreational as well as cultural activities. Landscaping of the park would favour local flora. Spatially, this park will be have a connection with the historical Pokrovskiy Park (Fig. 12 d), located 400 meters west of the proposed park, by means of the extension of the Krasnogo Znameni Prospect and a succession of plazas and boulevards that would promote spatial fluidity between these two metropolitan green areas.
- Pedestrian pathways: (Fig. 12 c). One of the main principles for the urban design of resilient cities is to prioritize walking as the preferred mode of travel, and as a defining component of a healthy quality of life. For that purpose, a 10 km network of paths injects the flow of pedestrian traffic from the city and along the coastline, complemented by stairs that would allow vertical access from the higher areas to the seafront. In addition, a 5 km bikeway would run along of the coastline on the recreational axis. These proposed transportation modes would be effective particularly during the warm months, and would become a sustainable alternative to the current traffic problem in the city.
- Integration of industry (Fig. 12 b). While in a short term it will not be possible to eradicate the energy plant located in the waterfront, it is possible to carry out a program in order to gradually reduce its emissions and pollution. Its façade as well as its open areas can be beautified to become an attractive landmark in the urban landscape. Additionally, by means of a process of land reclamation, a public promenade will be created in front of the industry, including attractions such as a fishing pier and cafés or restaurants.
- Habilitation of new public beaches. (Fig. 12 e). After cleaning up and decontamination, new beach areas can be available for public use, providing amenities and facilities. These beaches can be also reached from the pedestrian and bikeway network, as well as from the vertical accessibility

mentioned before.

- Renovation of housing, proposed in the extension of Avenue Krasnogo Znameni: (Fig. 12 f). An area, strategically located between the Pokrovskiy Park and the new Metropolitan Park, contains a group of old wooden houses forming a sort of small village. This renovation would stress the social character of the project by improving significantly the living condition of this neighborhood in terms of the preservation of the heritage as well as the benefit to the new green areas. Conversely, the city would also benefit from a continuous presence of people in these public areas that will contribute to their preservation and security.
- Landscape Viewpoints (Fig. 13 a). According to visibility analysis, scenic

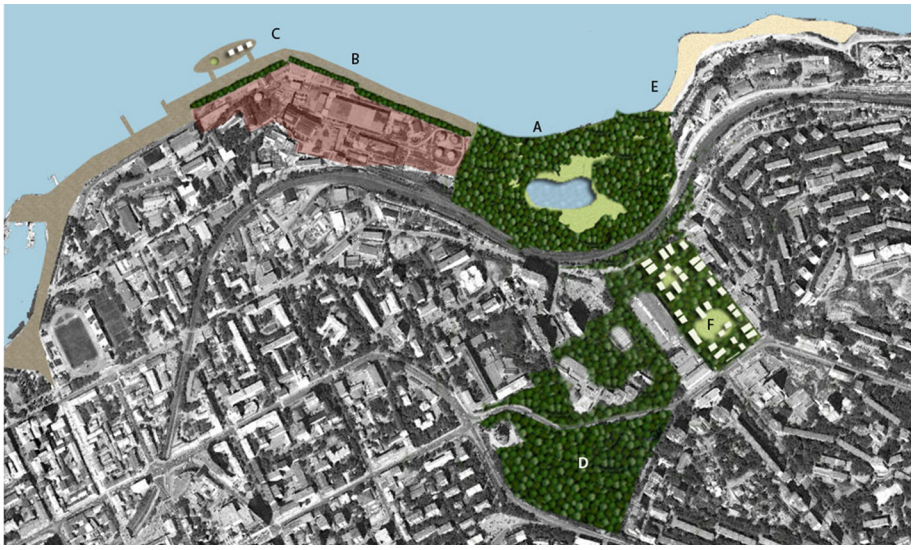

Fig.12. Detail of the proposed interventions around Poprovski Park, indicating the remodeled or new public spaces and the pedestrian or semi-pedestrian roads

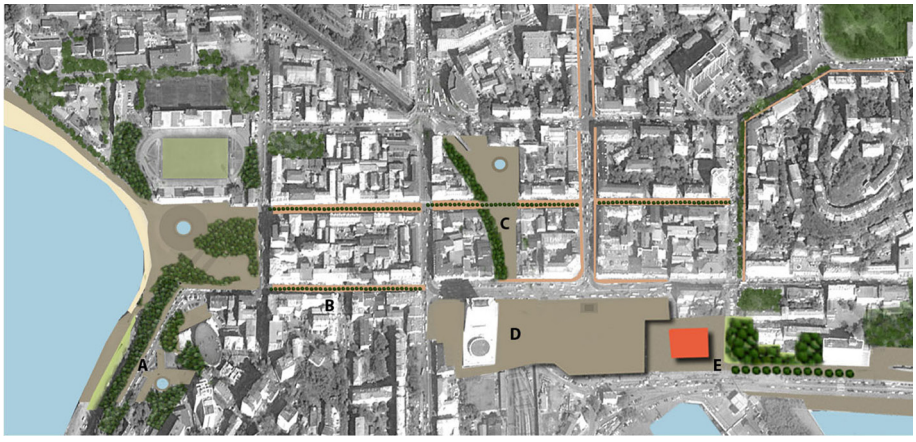

Fig.13. Detail of the proposed interventions in the central area, indicating the remodeled or new public spaces and the pedestrian or semi-pedestrian roads

vantage points are strategically located where the topography allows a panoramic view of the seascape.

- Renewal of urban-architectural environments of monumental and historical value (Fig. 13 b, fig. 14). The semi pedestrianization of Svetslanskaya street is proposed, in order to improve the visual connection between the Main Square and the Sports Quay, and at the same time promote a better visualization of the historic buildings in this street. The current traffic would not be affected, since 70% of the area is currently occupied by parking. Taking advantage of the topography, an underground parking area is proposed on the neighboring park opposite the Dinamo Stadium.
- Expansion of a new plaza over the railroad (Fig. 13 c, fig. 15): Covering a portion of the railroad and a vehicular road will allow to create a new public space in downtown, and at the same time promote a more fluid access between the city and the waterfront Main Square.
- Waterfront public green areas (Fig. 13 d and e). A system of green areas is proposed by the development of three tasks: the improvement of existing parks, the creation of new public spaces and the articulation of these by means of corridors or pedestrian areas. The character and function of each area will depend on its surrounding activities, reinforcing the character of the axis upon which it is located.

Fig.14. Left: Svetlanskaya street,housing fine example of historical building and currently 70% occupied by parking areas. Right: Proposal as semi-pedestrian roaddicating the remodeled or new public spaces and the pedestrian or semi-pedestrian roads

Fig.15. Left: Current narrow passage next to the railroad. Right: Proposal for a new square over the railroad.

Conclusion

Throughout its history Vladivostok endured political circumstances that have determined its spatial and cultural relationship with the sea. It began its history as an international trade center, later it became an ostracized military base and an industrial complex and subsequently it was again open to international trade, particularly with the Asia Pacific. In early Soviet times there was the unaccomplished plan to transform it into an ideal Soviet city in the East. Under Brezhnev, basic services were improved but the city grew giving its back to the sea. However, in the recent years there have been efforts to improve this relationship.

In this context, the urban and landscape renovation of the waterfront would increase the city's resilience by improving the quality of life of the residents and reducing the impact of potential risks.

The identification of both active and passive urban interfaces helps to recognize, locate and focus on the areas of greatest ecosystemic interest which therefore could have a catalytic effect due to their character of eco-joints. The method of interfaces can be enhanced by the use of analytic software, such as GIS and Space Syntax.

The proposed master plan suggests the social economic and environmental development of the Downtown Vladivostok and its waterfront. This plan aims to create new areas of social interaction or to improve existing ones, multiplying by 5 the current offer of green areas in the central area; to establish safety zones to reduce the city's vulnerability to natural and human risks; to revaluate its historical heritage; to provide the city of a network of pedestrian promenades; to reduce the overall impact in the environment and to promote a new social and cultural experience of the seascape. If successful, it expects to have a catalytic effect in other parts of the city.

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