Oslo Revitalization Areas as an Example of Striving for Good Quality of Urban Environment

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Abstract. The revitalization of post-industrial spaces in Oslo has greatly changed the panorama of the city, highlighting the network of intermingling green areas creating the green infrastructure of the urban area. The natural barrier - the River Akerselva emphasized by factory buildings during the industrial revolution, became an example of the green axis of the city, a space designed for sports and recreation. The research objective was to use a case study method to describe and categorize the redeveloped areas of the city of Oslo in proximity of the Akerselva River in order to observe and understand the tendencies in urban redevelopment. Currently, the area along Akerselva is an example of careful and thoughtful care for the monuments of industrial culture that supports surrounding residential and commercial spaces located on both sides of the river. There are modern non-industrial functions introduced within the former warehouse complexes to satisfy contemporary demands of the inhabitants of the capital city of Norway. Abandoned buildings obtained a life after life and today they are becoming the spots of creative ideas, centers of design and favorite places of meetings and recreation, which became evident due to the proximity of water, beautiful greenery and picturesque landscape. The result of the research is the finding that the green axis introduced into the city structure complements the redeveloped areas of various use and by its accessibility, connectivity and proximity it improves the quality of surrounding residential and mixed-use complexes. The new linear park has become a favourite space for residents regardless of the season or weather conditions. One of the conclusions of the research is that it was assumed that the riverside development will improve the quality of its surroundings. However it was found that although the River Akerselva Park itself is a winning enterprise and benefits from constant interest, the division of the city is still strongly perceptible and the location either on the eastern or western bank is still a determinant of the economic and social success of the investment.

1. Introduction
Oslo is one of the European cities that undergo crucial changes in the structure urban renewal processes. For the capital of Norway the main objectives for the revitalization were creating the new green infrastructure of the city and to provide the means for balanced development for both sides of the river that divides the urban area creating the equally attractive space on the eastern and western bank of Akerselva. The research objective was to use a case study method to describe and categorize the redeveloped areas of the city of Oslo in proximity of the river in order to observe and understand the tendencies in urban redevelopment as well as the impact of the revitalization processes on the city structure and its image.
2. Oslo – the outline of the urban renewal processes

The revitalization of post-industrial areas has become nowadays a desirable process that supports ordering the city structure, improves security and prevents the urban sprawl effect. It restoring valuable areas located in the city centre, but often extensively used and neglected for many years. However, their revitalization can take place in very different ways. Although, by definition, it is assumed that revitalization aim is to substantially improve the quality of space, together with social and economic issues, therefore should also be strongly focused on the current needs of residents.

"Revitalization is a process of degraded areas from a crisis state, carried out in a comprehensive manner, through integrated activities for the local community, space and economy, territorially focused, carried out by stakeholders revitalization based on the municipal revitalization program." [1]

A common phenomenon is the creation of a homogeneous tissue in revitalized areas, which despite the fact that it is functionally correct does not become an integral part of the city and still remains a barrier separating spaces from the main urban organism. The examples of developments are usually offices occupied by large corporations, large scale shopping malls or gated housing estates. Therefore, one of the most important revitalization tasks should be the improvement of safe communication crossing the revitalized area and "providing spatial solutions facilitating the movement of pedestrians and cyclists" [2]

2.1. The background of the city development

Oslo is one of the cities that have recently transformed the former dockland areas into a successful space. Capital of Norway Oslo is inhabited by 647,700 citizens which is more than 1/10 of the whole country population: 5,252,166 [3] with an area comparable to Poland. It is located at the northern end of the Oslo Fjord. The city has a "finger" layout, with a former and present centres located directly on the seashore. The areas of the city raised afterwards have climbed the surrounding hills.

"Looking at the Oslo skyline from the water, you can see that there are not very tall buildings in the city. The buildings create a compact mass climbing lazily on the surrounding hills, while the "heart" of the entire urban layout is located on the border between the mountains and the sea. The port wharf zone and adjacent streets are vibrant with life, becoming a stage for many cultural events." [4]

2.2. Division by the river

The city is crossed by the Akerselva River, along the south-north axis, that has set the border dividing Oslo into the western and eastern parts, where the left bank areas were considered less attractive. The river is a strong barrier due to the limited number of connections between both banks by bridges and a strip of industrial function developed along it. This situation is quite common taking into consideration the historical development of most of the cities that grew within the area of the fortifications located usually only on one of the sides of the river. [5]

Up till the 1980s, the division of the city was very strong. Well-arranged, western part of the city, a location of historical and cultural centres filled with public facilities, government buildings, high standard residential districts, was well connected by a system of parks and a large recreational and sports complexes in the upper part of the city as well as the beach at the seaside. The eastern part was raised on the ruins of the original city, which was burnt down in 1624 [6]. Its image was more industrial with an unclear urban structure, inhabited by a poorer part of the society (mostly by the immigrant population). In the inhabitants' awareness, it revealed as "the worse part of the city". Many spatial elements were created here in a random, organic way.

Research carried out in the 1990s showed that the average life expectancy of the inhabitants of the eastern part is a few years shorter than the average for residents of the western part. Large social resistance was also observed during the attempt to connect in one system metro lines servicing the western parts of the city with lines running to the east. Recent research shows that in schools located
in the eastern districts only 10% are children of indigenous people of Norway, when in the prestigious
western districts, the number of pupils from immigrant families is below 3% [7].

2.3. The beginnings of revitalization in the 80’s of the XX century.
In the second half of the XX century, the capital of Norway entered the time of prosperity and rapid
development. In the center of the city on its eastern side, former workers' quarters were located. The
city authorities have implemented ”Byfornyelse” - a long-term program of revitalization of the
neglected 19th-century districts of Grünerløkka, Gronland and Tøyen [8]. Many buildings, mainly
residential, were raised together with contemporary arranged urban space. The consistency and quality
of the structure has improved. Furthermore, representative public facilities were developed, such as the
Munch Museum, the headquarters of the police (a famous example of Norwegian architecture in the
1980s), the home of the Office of Spatial Planning and many others. The first stages of revitalization
caused, the 19th-century district of the eastern side of the Grünerløkka River has become a fashionable
and still inexpensive district, eagerly populated mainly by young people associated with culture and
art.

3. Contemporary Oslo revitalization

3.1. The axis of the Akerselva River
The history of industry in Oslo is inseparably connected with the river flowing through the city, which
in its entire course of around 8 km lies within the city's administrative boundaries. It originates from
Lake Maridalsvannet, which supplies drinking water to most districts in Oslo. In the upper part it
winds through the park and residential areas, crosses the southern - more urbanized part of the city to
finally reach the sea in Bjørvika bay, between the newly-built high-rise buildings of the Barcode
quarter. There are 20 waterfalls on the river and it crosses 23 bridges along the way. In the past, the
river not only supplied the city with water and served as the means of transport, but most of all it
fuelled the hydroelectric power plant and other industrial installations.

![Figure 1. Oslo map](https://www.openstreetmap.org/#map=11/59.9024/10.6794&layers=H
(accessed 15th May 2015); Colour coded layer – I. Mikołajska)

Currently, the area along Akerselva is an example of careful and thoughtful care for monuments of
industrial culture. The modern non-industrial functions are introduced within the historic tissue -
contrast but not competing with the heritage, favoured by the citizens. Abandoned buildings
obtained a life after life and today they are becoming the spots of creative ideas, centers of design and favorite places of meetings and recreation, which became evident due to the proximity of water, beautiful greenery and picturesque landscape.

Nydalen - once was a huge complex of a weaving, spinning mill and dye-works, a nailing and wire factory along with accompanying infrastructure located far from the city. Today, it serves as an office and residential complex and a business school, well connected by metro with the central part of the city. Further down the river, near the Bjølsen district, there was a large mechanical plant Myrens Verksted producing industrial machines from around 1850. Currently, these buildings are used as photographic halls and recording studios, and their rhythmic façades create harmonious closures of the spaces created by the meandering river in this area [9].

Månefisken - previous a lingerie factory for soldiers was transformed in the '90s into a club and a restaurant. Old bridges used to operate equipment are now used as the restaurant garden, and the location above a cascade of small waterfalls positively affects the popularity of the place. Going down the course of the river, another example of urban transformation can be found. A gigantic spinning mill became the Higher School of Fine Arts. In the former brick halls additional steel and glass divisions were introduced to obtain rooms with the necessary cubic capacity. Between the buildings, a space was arranged where students willingly spend their free time. The space consists of a larger green area, which is a fragment of the riverside park and several pocket-sized, accessible to all, interiors with a more private, university character.

![Figure 2. High School of the Arts; fot. Ida Mikołajska](image)

### 3.2. Vulkan
The former space of Vulkan plants (ironworks producing steel elements) has been transformed into a hybrid building, gaining recognition in both architects and residents as well as tourists. The space includes residential apartments, 2 hotels, restaurants, offices (mainly various design studios), a cultural centre, a dance studio and the first covered food market in Oslo. Innovative, environmental friendly architecture determines the nature of the complex, which in addition to numerous solutions typical for sustainable design has its own 300-meter geothermal well and office building, which façades of an extensive solar water heating system. Two huge hives designed by a leading team of architects Snøhetta have been installed on the roof of one of the buildings. The most attractive feature of this complex are the sequences of mutually interpenetrating urban enclosures. In principle, there are no fenced spaces here. The main pedestrian axis has been created, where car traffic and cycling is restricted. It is not shaped as a typical pathway; because in some places narrow, it expands elsewhere
into small squares. Almost all the time it accompanies the river, once on one side the other time on the other side. Small areas, the so-called Pockets of activity [10] area provided where one can rest on a specially designed bench or in one of numerous cafes, deviating from the main road. These spaces, which have been designed as semi-private, are not fenced, but in most cases they are designed on a different ground level or even on flat terraces and roofs of buildings.

3.3. Pipervika Bay: Aker Brygge + Tjuvholmen

Pipervika gained prestige when in 1931-1950 a monumental town hall with two rectangular towers was built there - one of the symbols of the city, a place of ceremonial handing over of the Nobel Peace Prize. Until 1982, the Akers Mekaniske Verksted brick complex occupied the western part of the bay. In 1983, Niels Torp developed a new development plan for this part of the city. It was decided to replace the degraded buildings with 260,000 m2 of a hybrid complex of apartments, offices, shops, hotels and restaurants. [11] The idea turned out to be successful; there were many investors and well-known architects willing to cooperate. The first stage was completed in 1986 and the next one in 1997. A new, luxurious and fashionable part of the city was created.

In 2010-2015, another part of the project was raised - Tjuvholmen (revitalization of the port space), where old docks were replaced with luxury apartments, restaurants and shops. The Astrup Fearnley Museum of Modern Art (designed by Renzo Piano) and a five-star hotel were located on the promontory. The ground floors of the buildings near the bank created the city embankment - the promenade and the beach. Currently, Aker Bryge and Tjuvholmen form a coherent whole - a quarter of diversified buildings that seem to float on fjord waters. Countless number of bridges, battens, all connections at various levels create a thicket characteristic of the historic port buildings of Norway (e.g. the Brygge wooden district in Bergen). The space belongs exclusively to pedestrians; cars are housed in a huge parking lot underneath the whole quarter.
The district is liveable at any time of the day. In the morning it is filled with inhabitants rushing to work. During the day the space is occupied by office workers and art lovers heading to the museum, and in the evening, when pubs and restaurants enjoy the greatest popularity - hundreds of lights illuminate the glazed façades and bounce off the water surface create an amazing experience associated with the aurora lights.

3.4. Bjørvika
Formerly constructed as an industrial bay with a railway siding and a transit road, currently works as a setting for the Oslo Opera House (the Snøhetta project) - one of the most recognizable buildings in the world. It is an extraordinary example of contemporary architecture; the external space of the building is the passage from the wharf of the city to the area of sacrum created by the Opera. Not only the interior of the building but also its roof-façade is a full public space [12] "On the roof of the opera one can walk, ride a bicycle or take a boat on the water side. Wandering is fascinating because the artificially constructed landscape changes from minute to minute. "[13] The city has gained a symbol, where people often come only to experience the place, to look at the city, the sea, the sky, meditate from a distance.
On the north-eastern shore of the bay, on the plots adjacent to the Opera building, a line of skyscrapers known as "Barcode" (bar code) was raised. A new quarter combining the nucleus of the financial district and attractive residential facilities with sea views. The area was excluded from traffic, as it was in all of the revitalized areas of the city. The name of the quarter came from the idea of maintaining the facade of buildings in black and white and setting them alternately, the narrow high elevations actually resemble a bar code. Despite the minimum spacing between the blocks of
skyscrapers, spaces created between them and sometimes also under them are attractive, refined in every detail.

4. Conclusions
The revitalization of post-industrial spaces in Oslo has greatly changed the panorama of the city, highlighting the network of intermingling green urban enclosures. The natural barrier - a river, emphasized during the industrial revolution by factory buildings, became an example of the green axis of the city, a space for sports and recreation in which educational and cultural centers developed, vital focal points of sustainable urban life.

Although the new linear park has become a favourite space for residents regardless of the season or weather conditions and subsequent investments significantly improve the quality of the eastern parts of the city, the division of the city is still strongly felt, especially in the mentality of residents. The western part is considered more attractive and attracts greater number of investors.

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