Methods for converting industrial zones

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Abstract. In this article, industrial zones of Saint Petersburg and Hong Kong were considered. Competitive projects aimed at developing the grey belt of Saint Petersburg were considered. The methodology of the survey of reconstruction of the industrial zone of Hong Kong is also analyzed. The potential of the city's grey belt lies in its location on the border of the city's historical centre. Rational use of this potential will make it possible to achieve numerous objectives, including development of the city's transport infrastructure, positioning of business functions, and organization of housing and the city's system of green public spaces.

1. Introduction

St Petersburg's historical industrial/resident belt took shape as factories and housing for factory workers were developed along the city's rivers and south of the city centre, canals in the 19th and 20th century, centu, mainly to the

The characteristics of the monocentric development model which in most of the world's large cities has been transformed under the influence of market mechanisms have been preserved in Leningrad / St Petersburg, as in other cities in Russia, due to the priority placed by the state on development of industry and Land use for no charge during the Soviet period.

Nowadays the great importance of the development of old industrial zones is noted. Reconstruction of industrial buildings is able to stimulate the economy, to disperse the tourist center, thereby reducing the transport load, and to add extra workplaces.

At present, the territory of industrial zones, or the "grey belt" is troubled with undeveloped and outdated infrastructure [1]. An industrial territory, ringing the historical center is called the grey belt. Production in most factories has stopped, and now something else can be created on those territories. Almost any large city has a similar structure: the old city, the industrial strip behind it, which was inherited from the century before last, and then the city of the 20th century [2- 4]. The most common problems include the pollution of the territory, the presence of a large number of point objects that are protected by the state, and the disjointed ownership structure. The sites of the industrial zone have a great potential for development.

2. Perspective for the development of the grey belt in Saint-Petersburg

The industrial zone of St. Petersburg is a territory with a huge development degree of the transport frame. Today it is the only reserve for urban development of the historic center of the city. The area of industrial buildings in St. Petersburg is about 40 million m² (figure 1). According to various estimates, this zone occupies about 40% of the total area of the city.
At the present time, St Petersburg's industrial areas are a «lacuna» between the city centre, where up to half of workplaces are situated, and the dormitory districts, where people live, unable to find jobs close to home and with insufficient and insufficiently diverse opportunities for leisure and amusements. The disproportion which has arisen between where people live and where they work means that they have to commute to and from work in large numbers on weekdays. Another aspect of this problem in addition to functional monocentricity is that recent years have seen an intensification of people's emotional and psychological need to visit the city centre given that this is the only place where they can find a rich variety of impressions and types of activity capable of meeting their cultural needs.

The Committee for Economic Policy and Strategic Planning is the coordinator of the proposals preparation for the use and involvement of industrial areas adjacent to the historical center of St. Petersburg. First of all, an inventory of this territory was made.

Due to the lack of full state funding, the committee acted in two ways: carrying out work on the inventory of part of the territory and establishing the completeness and sufficiency of information. Carrying out inventory work was made by the executive bodies of the state power of St. Petersburg. Surveys with departure to the territory were made. These measurements were necessary to draw up a plan for the development of industrial zones for 2030.

In 2016, the Urban Planning and Architecture Committee announced a closed international architectural and town planning contest for the development of the Concept for the planning and space-spatial transformation of south part of the historical industrial belt of St. Petersburg. It is proposed to develop a concept of functional-planning, three-dimensional development of one of the "pilot" zones and the general concept of spatial development and transformation within the boundaries of competitive design. As a result of voting of the members of the expert council and the jury in May 2016, a list of participants was identified, which included 9 architectural bureaus.

The opinions of participants in the process of town-planning development: residents, owners of real estate, business, people working in the given territory and expert assessments have a great influence on the result of the competition.

9 teams from Russia, Finland, Netherlands and Norway took part in the competition. Between the contestants were divided sections of industrial zones of St. Petersburg with an area of about a hundred hectares. According to the terms of reference, 30% should be given to recreation, 30% - to jobs and 40% - to housing [5, 6]. Some territory development solutions are show in figure 2.
Competition entrants are asked to propose a concept for the spatial development of an area of approximately 4,000 hectares stretching from the River Yekateringofka in the west to the Neva in the east and from Obvodny kanal in the north to the residential districts in the south. Three 'pilot' zones have been selected in the above area, of approximately 100 hectares each. A draw will take place to determine which of the pilot zones is to be allocated to which of the teams invited to take part in the competition.

In addition to the overall concept for spatial development and transformation in the competition area, each team invited to take part should propose a vision of the layout, architectural volumes, and urban setting in one of the three pilot zones in the context of its concept for the southern part of the grey belt.

The competition is a step towards developing a strategy for the spatial development of the southern part of the historical industrial/residential belt and for incorporation of this strategy's main principles in the new Master Plan for St Petersburg.

In many projects, about half of the territory is occupied by parks of urban and regional importance. The concepts of these projects represent a landscape strategy for creating highly efficient ecosystems, a strategy for equipping green production sites along transport corridors, and a strategy of hubs-epicenters of increased density around metro stations.

It was also proposed to create a new business area in the "grey belt", which could reduce pulsating migration. The creation of an "intermediate" business activity belt between the center and the sleeping areas of the south will shorten the daily movement of citizens and unload the transport system.

There were projects aimed at preserving the industrial heritage. But this is done with a complete loss of the original industrial function: factories and railway interchanges remain, but in the form of lofts or public spaces.

The architectural bureau from Netherlands proposed a framework in which to act in the transformation of the industrial zone. First, do not try to immediately build up everything, but create...
local centers that would stimulate the transformation around them. Secondly, do not try to do redevelopment from scratch, but preserve what is now, giving objects to conditional youth, so you do not have to wait for a more favorable investment climate.

During the competition an exhibition of the contestants’ works was held and 3 winners were named. Competition projects will not be implemented. In the future, it is planned to use these projects, on the basis of which the architectural authorities will develop the final plan for the development of industrial zones.

The strategy of economic and social development of St. Petersburg for the period until 2030, the grey belt is defined as a priority territory for transformation in accordance with the system of goals of social and economic development of St. Petersburg.

The Government of St. Petersburg, in coordination with the federal authorities and administrations of the city’s universities, should make efforts to include in the multifunctional university campuses formed on the territory of the city not only the necessary educational and social infrastructure, but also intercollegiate science Research centers and sites for the creation and commercialization of innovative developments in accordance with the strategic development of St. Petersburg until 2030.. Promising areas for such projects can be the territory of industrial zones in need of renovation.

Industrial building zones are found in many developed countries. Each country chooses its own way of developing these territories. For comparison, let us consider an example of the initial stage of development of an industrial zone in the city of Hong Kong.

3. Revitalizing Industrial Buildings in Hong Kong

Many industrial buildings were built in early 1950s. Hong Kong experienced major restructuring in the past decade and transformed into an inter-national finance center [7]. Most of the manufacturing activity has moved into Mainland China where labor wages are low leaving behind some 1.07 million m² of under-utilized or vacant industrial buildings.

Semi-structured interviews were conducted with building professionals and scholars to collect their views on impacts of revitalizing industrial buildings (RIB) relating to the economic, social and cultural aspects. Their comments together with literature review became the references for deriving questionnaires to study the impacts of RIB. Large scale questionnaire surveys were conducted. The questionnaires were distributed to professionals, stakeholders and the public to collect their views. The returned questionnaires were analyzed to identify the impacts of RIB on the society [8, 9].

The research was conducted in three major stages: the three stages are formulation of questionnaire, questionnaire sur-vey and data analysis.

The major variables of impacts in implementing RIB were identified, which are related to:
1. Converting industrial buildings into suitable spaces for eco-nomic and social development
2. Accounting for the increase in property value/rent of industrial buildings
3. Change in market value of undergoing activities causes increase in property value/rent of industrial buildings
4. Increase in rent cause for closing down of small business in industrial buildings
5. Wholesale conversion can conserve environment
6. Lead to an imbalanced distribution of land and economic resources

The society can be benefited from RIB by generating more suit-able and inexpensive land and premises to meet the economic and social needs for living, working and playing so as to relieve the pressure of inadequate land supply for commercial and residential uses [4]. Many of the existing industrial premises have changed to other unauthorized use like offices or art studios. The design of the old industrial buildings generally does not comply with the current building regulations and endanger public safety. The old industrial buildings can be upgraded to comply with building regulations during wholesale conversion. The current unauthorized uses in these industrial buildings can be regulated and safeguard public safety. The general environment of former industrial areas can be improved by redevelopment or wholesale conversion.
4. Conclusions

Reorganization of industrial zones in each country is different, it is impossible to identify the right approach. It is important not to demolish old industrial facilities, but to reconstruct; otherwise there is a risk of building the entire residential complex. This will involve the reproduction of the situation with the grey belt, the industrial territories will move to the outskirts, behind them there will be new residential quarters and so on in a circle.

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