

STRUCTURAL INTEGRITY OF URBAN ENVIRONMENT IN THE IMPACT AREA OF THE RAILWAY CIRCLE IN RIGA

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The city of Riga experienced a real development boom in the second half of the 19th century and early 20th century. To a great extent it was facilitated by the development of traffic infrastructure, especially railways. The first railway was built in the territory of Latvia in 1860, and it was the section Rītupe–Daugavpils on the railway line St Petersburg–Warsaw. A year later a railway track was built from Daugavpils to Riga, resulting in a rapid development of the railway junction of Riga. In 1868 Riga was connected with Jelgava and in 1872 a bridge was built across the River Daugava [19]. It increased the capacity of railway infrastructure – in the early 1870s railway lines were built to Mangaļi and Bolderāja in Riga to facilitate development of the port, in 1877 the Riga–Tukums line and in 1889 the Riga–Pskov line were opened [2]. Overall, at the end of the 19th century and beginning of the 20th century the area covered by the railway tracks in the city of Riga doubled [10].

Development of traffic infrastructure boosted industrial growth. Within a short period, several business-facilitating laws were passed – in 1861 the monopoly of burghers (city dwellers who had acquired the rights laid down by local law [10]) on the purchase of goods brought to the city, which had existed in Riga since in the Middle Ages, was abolished, but in 1866 the existing restrictions on the activities of an industrial character and activities of craftsmen were removed [19]. As a result, the cities along the railways quickly acquired new factory buildings and warehouses [2]. In 1864, there were 92 enterprises in Riga, in 1879 their number increased up to 145, but in 1890 – up to 228 [19]. In the last decade of the 19th century, industrial growth subsided, while maintaining a progressive tendency, and by the end of the century the number of enterprises increased up to 244 [20]. The connection to the railway immensely contributed to the development of such enterprises like the Russian–Baltic Carriage Factory “Fēnikss” (later Riga Carriage Building Factory), the electro-mechanical plant “Unions” (VEF), Kuznetsov’s Porcelain and Faience Factory (Riga Porcelain Factory). A convenient transport infrastructure and introduction of the latest manufacturing technologies in the factories led to an explosion-like development of industry in Riga. If over 36 years the number of manufacturing enterprises in Riga increased by 2.6 times, then the number of workers they employed grew from 5.6 thousand in 1864 to 43.5 thousand in 1900, thus increasing by 7.8 times, but the value of the output grew

¹ Integrity – a term used in computer science to designate protection of a system, a programme and data against any accidental or malicious damaging or alteration. In this article the term is used to describe the structural integrity of the city and coherence of its separate elements (author's comment).

respectively from 4.9 million roubles to 85.2 million roubles, i.e. by 17.4 times. Thus, Riga took the leading position in the industry of Russia, being way ahead of both Petersburg and Moscow.

The number of population in Riga grew proportionally with the industrial development. Thus, in 1856 there were 70.5 thousand inhabitants residing in the city, by 1897 this number quadrupled and reached 282.2 thousand, and by 1913 it increased even more to 517.3 thousand [6, 10]. Economic growth also had a positive impact on the city budget. Between 1860 and 1900 it grew by 5.7 times, and by 1913 it increased even more by 3.1 times [12].

Urban growth was also reflected in the spatial configuration of the city. If until the mid-19th century Riga's urban sprawl was more or less kept within the borders approved back in 1828, then in the second half of the century several projects for expansion of city boundaries were elaborated. Though, due to the dawdling of the government and municipal authorities and inconsistency of their actions their implementation was only partial. Although legally until the end of the 19th century the city covered the area of 5.2 ha, its actual territory was 9.0 ha [10]. Despite the lack of legal framework for city boundaries, the proportion of built-up areas increased considerably (almost three times). However, construction was not developing as dynamically as the industry and periods of more rapid growth alternated with periods of depression. The number of residential buildings constructed over one year between 1879 and 1913 varied from 32 to 397 [11]. Although mostly low-rise wooden houses were still built in Riga, at the same time construction of multi-storey masonry buildings began, especially in the early 20th century [11], particularly in the city centre inside the railway circle [8], reserving the territory outside it for industrial development. Exactly in the second half of the 19th century central parts of the city acquired the spatial structure that has been preserved up to this day with an appropriate spatial and visual image [6].

Period	Number of population, thousand ¹	Industry			City budget, mil. RBL	Construction of residential buildings		
		Number of enterprises	Number of workers, thousand	Output, mil. RBL		Wooden houses	Masonry houses	
							Low-rise (1–3 fl.)	High-rise
until 1860	70.5	92	5.6	4.9	0.7			
1861–1880	102.6	145	12.1	18.7	1.8			
1881–1890	193.9	228	17.0	27.9	2.7	329	179	36
1891–1900	282.2	244	43.5	85.2	4.1	1425	311	140
1901–1913	517.3	341	83.2	216.5	12.8	1929	390	1023

Table 1. Growth of Riga at the end of the 19th and beginning of the 20th century [10, 11, 12, 19, 20].

If the architectural heritage characterising aesthetic, technical and functional qualities of the respective period is highly appreciated and Riga has become one of the UNESCO World Cultural Heritage sites, ensuring at least its moral preservation for the next generations, then the place of landmarks left by the industrial growth – factory buildings and railway tracks – have escaped proper appreciation in the cityscape, and importance of their preservation in Riga's urban fabric has not been adequately assessed. The list of cultural heritage sites of national and local importance includes several architecturally valuable buildings, yet the integrity of the site

¹ The number of population in Riga and its rural area (*Landvogtei* or patrimonial district). Territories of the area were governed by the city, yet they had separate administrative and judiciary authorities. Different territories were not united. Suburbs of Riga started forming there and in the 19th century these were the territories where the main industrial enterprises were established.

with infrastructure objects is not actually maintained. In view of the recent active conversion of industrial objects and radical transformation of industrial territories, particularly pressing becomes the issue of integration of the signs of urban history into the spatial plan of the territories to be transformed. One of the forms of manifestation of urban identity is the structural identity, and the railway circle with the adjoining industrial territories appeared in the spatial structure of Riga largely owing to the economic growth of the city experienced at the turn of the century.

Today several factors are indicative of the threat to the structural integrity of the impact area of the railway circle. In an attempt to shift from the industry, the Riga Development Plan for 2006–2018 intends to transform many industrial territories into the areas of centre construction or areas of mixed construction [14]. Neither the development plan as such, nor assignments of detail designs for individual sites include conditions for preservation of the structural precision of the layout. Thus, each author's understanding and not the city guidelines determine the principles of urban and spatial development in the projects for transformation of the environment, e.g. Riga Freight Station No 1 in the area of Ganību dambis, Pulkveža Brieža iela, Hanzas iela and Skanstes iela has almost completely lost railway structures and tracks. Currently a detail design is being elaborated for this territory, and the prepared drawing shows no traces of its former functional utilisation. The linear structure characteristic of railway tracks has been replaced in the new urban design with an impersonal, semicircular "boulevard" differing from the site context and history. Several streets connecting radially to this boulevard divide the territory into several segments [5]. To preserve the impact area, a slightly more successful solution has been found for the historically active railway infrastructure in the development concept for Andrejsala. In its original version, the architectural office "OMA"¹ from Rotterdam (The Netherlands), proposed a dense construction with an accentuated height [13], later during the elaboration of the detail design the office "Grupa 93" from Latvia toned down the solution taking into account opinions of competent institutions and results of the public discussion [1]. As a result, a dynamically contrasting image of the historical spatial structure was softened, thus also giving lesser emphasis to the importance of Andrejsala power station and elements of its service infrastructure in the era of Riga's economic growth. The elaboration of the detail design has begun for the territory of the chemical factory "Nitra" (Riga Varnish and Paint Factory) that was founded in 1898 and is located between the Zunda Channel and Daugavgrīvas iela in Pārdaugava. It is also intended to transform considerably the territories of the former factory "Omega" ("Ērenpreiss", "Sarkanā Zvaigzne") and the factory "Unions" (VEF).

The urban structure can preserve landmarks of historical development for centuries, and the conveyed message, for instance, that can be seen in the street network or configuration of the built-up area, allows understanding artistic and aesthetic priorities of the economic and social life and of the living environment of the respective period [3]. Since up to 70% of all the variety of surrounding spatial forms people perceive unconsciously, and the impact of the diversity of forms on the person's subconsciousness is an essential aspect of information perception [17], protection of the signs of urban history and information encoded in them is crucial for preservation of integrity and identity of urban environment, as well as for maintaining the public

¹ The development concept for Andrejsala was elaborated as part of the development concept *Riga Port City* commissioned by the company "Jaunrīgas attīstības uzņēmums" by the Rotterdam architectural office "Office for Metropolitan Architecture" under the guidance of Rem Koolhaas in partnership with the engineering company "Ove Arup & Partners Ltd" from London and the office of landscape architects "Inside Outside" from Amsterdam.

interest in its preservation. Ignoring this fact and placing new spatial structures above the previous layers, changing them radically or even destroying, it is much likely that the new urban formations would give semantic information completely differing from the logical development of the place and space. Thus, a similar status of protection like that which is determined for individual historically valuable buildings, their groups or structures of built-up areas should also be applied to the characteristic elements of urban spatial structure.

The viability of this approach at a regional level is proved, e.g. by the German experience how to preserve the landmarks of their golden era of industrialization in the Ruhr Basin turned today into the degraded territories. Thus, as part of the 4th International Building Exhibition (*Internationale Bauausstellung*) of 1989–1999 the project of the Emscher Landscape Park (*Emscher Landschaftspark*) was implemented, which, on the one hand, became the main activity of the exhibition [4], but on the other hand, demonstrated the ability to attract attention for a longer period, becoming a popular visitor attraction.

On a local scale, the importance of the structural integrity of historical urban landmarks show, e.g. transformation projects for Hafen City in Hamburg (Germany) or Canary Wharf in London (Great Britain), which intensively using opportunities provided by modern technologies and adequate techniques of spatial expression, both semantically and structurally have incorporated landmarks left by the previous periods that were significant for urban development, turning them into impressive features characterising our era. The intricate signs of urban history are discernable in the project for regeneration of the environment of Potsdam Square in Berlin (Germany), the impact area of the former Berlin Wall, where the new spatial structure incorporates the identity created by the new landmarks, completely abandoning the idea of restoring the pre-war urban structure and leaving vacant a large, bleak space void of any public activities, carrying on the depressing atmosphere of the split city that had prevailed there for several decades. Thus, on the one hand, the structural integrity of urban environment ensures preservation of historical information, and on the other hand, provides vast opportunities for development, applying modern means of spatial and formal expression.

Today urban processes include both tendencies of urban sprawl and urban shrinkage. Quite often a comfortable living space for an individual means a mansion in the suburban area, and this notion has led to emergence of *parasite-villages* which only satisfy the need for a dwelling, but do not make available everyday social services, vegetating at the expense of nearby towns and cities. Although already in the first quarter of the 20th century theoretical guidelines of the so-called *New Urbanism* [16] specified disadvantages of urban sprawl and defined basic principles of a sustainable living space, they are not consistently implemented in practice because of differing interests of various local governments and insufficient coordination among them, as well as due to the absence of a regional planning authority. In this situation options should be found for development of high-quality living spaces within the cities, and one of the solutions would be reassessment of the potential of former industrial territories and possibilities of their functional transformation.

According to the studies, historical centres are the most popular visitor attractions in the cities, partly because of the multi-layered nature of structural or spatial information conveyed by the landmarks of history and partly because of intensification of public life in the places abounding in information and functions. Viewing critically the over-commercialization of the urban environment [21], it has to be admitted that “as opposed to commercialized objects of historical architecture [as risky] is the architecture of derelict factories, desolate areas and so on, where the forms of life have not changed to such an extent or have simply disappeared, without new and different human activities forming instead” [18]. Since normally newly created environment development projects cannot stand out in a new site with these qualities, their

capability of visitor attraction is significantly lower. Consequently, preservation of the signs of history in environment transformation projects, also considering attraction of new public activities, can produce a sustainable and high-quality urban environment meeting the actual needs and interests of the society.

Such an approach should be defined in the urban development documents in the first place. Although “The Riga Long-term Development Strategy until 2025” includes sections “Urban Environment – the Basis of Riga’s Development”, “Strategic Objectives for Urban Environment” and “Guidelines for Spatial Planning in Riga” defining factors that facilitate and impede development, as well as the main tasks for the future [15], they fail to mention anything about the necessity to review the efficiency of utilisation of urban territories and focus on industrial territories, including the potential utilisation of the railway impact area in order to create a sustainable living environment.

Updating and supplementing the existing urban development documents or drafting new ones, it is necessary to determine the approach to the role of signs of history in the structural integrity of the city, as well as to specify priority areas for which special regulations of protection should apply. First of all, such regulations should be applied to the railway circle of the city and its impact area on both sides of the Daugava.

Today the spatial environment of the railway circle in the centre of Riga offers a unique opportunity to create the second Boulevard Circle in Riga which could combine public train and tram services, cyclist routes and landscaped pedestrian promenades. That would be a project continuing traditions of the spatial transformation project for the city centre developed by J. D. Felsko and O. Dietze in 1857, and projects for greenery and landscaping of the canal banks elaborated by A. Vendt in 1859 and by G. Kuphalt in 1880 [7]. The next step of such development is preservation of structural and spatial identity of industrial territories adjoining the railway circle in transformation projects.

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Bratuškina U. Pilsētvides strukturālā integritāte Rīgas dzelzceļa loka ietekmes telpā.

Straujākos attīstības tempus pilsētas vēsturē Rīga piedzīvoja XIX gadsimta otrajā pusē un XX gadsimta sākumā. Lielā mērā to sekmēja satiksmes infrastruktūras, īpaši dzelzceļu attīstība, kas veicināja rūpniecības uzplaukumu. Ērta satiksmes infrastruktūra savienojumā ar jaunāko ražošanas tehnoloģiju ieviešanu uzņēmumos nodrošināja Rīgā rūpniecības sprādzienveida attīstību. Pilsētas izaugsme tieši atspoguļojās tās telpiskajā veidolā. Tieši XIX gadsimta otrajā pusē pilsētas centrālās daļas ieguva līdz mūsdienām saglabājušos plānojuma struktūru ar atbilstošu telpiski vizuālo veidolu.

Pilsētas uzplaukumu veicinošās saimnieciskās darbības atstātās zīmes mūsdienās nav pienācīgi apzinātas, un to kā Rīgas pilsētībūvniecības vēstures zīmju vieta nav novērtēta. Ievērojot, ka pēdējā laikā notiek intensīva rūpniecības objektu transformācija un to aizņemto teritoriju radikāla pārveidošana, jautājums par pilsētas vēsturiskās struktūras zīmju iestrādāšanas pārveidojamo teritoriju plānojumā un telpiskajā veidolā iegūst īpašu aktualitāti.

Pilsētas plānojuma struktūra var saglabāt vēsturiskās attīstības zīmes gadsimtiem ilgi, un vēstījums, kas nolasāms, piemēram, ielu tīkla rakstā vai apbūves kārtojumā, ļauj izprast gan konkrētā vēstures posma saimnieciskās un sociālās dzīves, gan sabiedrībā valdošās dzīves telpas veidošanas mākslinieciski estētiskās prioritātes. Tādējādi pilsētas plānojuma struktūras raksturīgajiem elementiem kopumā būtu jāpiemēro līdzīgs aizsardzības statuss kā tas tiek īstenots atsevišķām vēsturiski nozīmīgām ēkām, to grupām vai apbūves struktūrām. Vēstures zīmju saglabāšana vides pārveides projektos kontekstā ar jaunu sabiedrisko aktivitāšu piesaisti var nodrošināt ilgtspējīgas un kvalitatīvas pilsētvides veidošanos atbilstoši aktuālajām sabiedrības vajadzībām un interesēm.

Rīgas centra dzelzceļa loka telpiskās vides potenciāls piedāvā mūsdienās unikālu iespēju izveidot Rīgā Otro bulvāru loku, kas varētu apvienot starppilsētu un pilsētas sliežu transporta, veloceļu satiksmes un izvērstas labiekārtotas gājēju promenādes kvalitātes. Šādas attīstības nākamais solis ir dzelzceļa lokam pieslēdzošos rūpniecības teritoriju strukturālās un telpiskās identitātes saglabāšana to pārveides projektos.

Bratuskins U. Structural Integrity of Urban Environment of the Impact Area of the Railway Circle in Riga

The city of Riga experienced a real development boom in the second half of the 19th century and early 20th century. To a great extent it was facilitated by the development of traffic infrastructure, especially railways which promoted the growth of industry. A convenient transport infrastructure and introduction of the latest manufacturing technologies in the factories led to an explosion-like development of industry in Riga. Urban growth was also reflected in the spatial configuration of the city. Exactly in the second half of the 19th century central parts of the city acquired the spatial structure that has been preserved up to this day with an appropriate spatial and visual image.

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The urban structure can preserve landmarks of historical development for centuries, and the conveyed message, for instance, that can be seen in the street network or configuration of the built-up area, allows understanding artistic and aesthetic priorities of the economic and social life and of the living environment of the respective period. Thus, a similar status of protection like that which is determined for individual historically valuable buildings, their groups or structures of built-up areas should also be applied to the characteristic elements of urban spatial structure. Preservation of the signs of history in environment transformation projects, also considering attraction of new public activities, can produce a sustainable and high-quality urban environment meeting the actual needs and interests of the society.

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Братушкин У. Структуральный интегритет городской среды в зоне воздействия железнодорожного круга в Риге.

Наиболее высокие темпы развития в истории Риги город пережил во второй половине 19-го и в начале 20-го века. В значительной степени это способствовало развитию транспортной инфраструктуры, особенно железных дорог, что создало благоприятные условия росту промышленности. Удобная транспортная сеть в сочетании с новейшими технологиями производства на заводах способствовали взрыв промышленного развития в Риге. Рост города непосредственно отражался в пространственный образ города. Именно с тех времен центральная часть Риги сохранила свою пространственную структуру и характерный визуальный образ.

Градостроительные знаки время экономического расцвета в настоящее время достаточно не определены и место их в качестве ориентира в городской ткани не оценена. Учитывая, что в последнее время происходит процесс интенсивного преобразования бывших промышленных зон, вопрос о включении знаков городской исторической структуры и пространственных форм в новых планах развития приобретает особую актуальность.

Градостроительная структура может сохранить знаки исторического развития на протяжении многих веков, и сообщение, которое может быть прочитано, например, в уличной сети или в сочетании элементов застройки, позволяет понять приоритеты как экономической и социальной жизни общества, так и доминирующие художественные и эстетические принципы данной эпохи. Таким образом, характерным элементам градостроительной структуры в целом необходимо присвоить подобный статус защиты, как это осуществляется с отдельными исторически значимыми зданиями, их группами или фрагментами городских структур. Сохранение исторических знаков в проектах преобразования бывшего пространства в контексте новых общественных активностей может обеспечить формирование устойчивой и высококачественной городской среды в соответствии с действующими социальными потребностями и интересами.

Пространственный потенциал железнодорожного кольца центра города Риги предлагает уникальную возможность создать второй круг бульваров, которое может сочетать потоки междугородних и городских железнодорожных перевозок, велосипедных дорожек и ландшафтные

качества с благоустроенным и озелененным пешеходным променадом. Следующий шаг такого развития является обеспечение структурной и пространственной идентичности промышленных зон прилегающих к железнодорожному кругу в проектах трансформации.