

# Between Waterway and Railway – Industry along the Danube Riverside in Budapest

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RESEARCH ARTICLE

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## Abstract

*The most significant current discussions regarding Budapest's urban development are the restructuring of former industrial areas and redesigning the Danube riverbank. The research approaches this complex question by giving a historical overview of the industrialisation and deindustrialisation of the Danube zone, analysing the changing relationships among river, city, industry and railway. This urban area, situated between the waterway and railway, could be the first to develop to achieve sustainability. The paper highlights the importance of the re-use of urbanised sites and buildings, a green mobility concept based on the existing railway system and the natural and historic values of the riverbank. Moreover, in this time of increasing globalisation, the recognised local identity becomes a principal component of urban development.*

## Keywords

*Budapest · Danube · railway · industrial area · urban renewal · sustainability*

## 1 Introduction

The European Union defined the Strategy for the Danube Region in 2010 with, Budapest preparing the “Budapest 2030 Long-Term Urban Development Concept” in 2013. [7] Both strategy visions identify the Danube as the guiding spine for major development and give priority to brownfield site renewal. Besides this political background, the urban evolution of the Danube riverside is one of the most significant research and project themes in Budapest for a long time. [5] This paper analyses the history of industry along the Danube in five periods, focusing on two principal components and their changing relationship that defined the development of this zone: the waterway and the railway. On one hand, Budapest is the child of the Danube; the river is the primary element of Budapest's identity and its sustainable future urban life. On the other hand, the railway system in parallel to the Danube, which although born at the time of industrialisation, despite the end of industry, survives through the contemporary concept of green mobility.

The teaching of urban design for future architects at the Budapest University of Technology and Economics introduces real problematic issues into the education to develop the common knowledge. In the spring semester of 2013/14, the urban design studio worked on the future of former industrial areas next to the Danube. This paper not only uses historical and actual information according to the topic, but is also based on the university urban design process led by the authors. Research by design, a new research method, provides the opportunity to establish a relationship between research and design, education and theory; because, “the architectural design process forms the pathway through which new insights, knowledge, practices or products come into being”- from the Charter on Architectural Research. [11]

## 2 Historic overview

To recognise the development potential of the former industrial areas along the Danube, it is essential to give a historical overview highlighting the changing attitudes. Before industry appeared, the riverbank was the place of transport. Then industry arrived in the city and found the riverbank; following this

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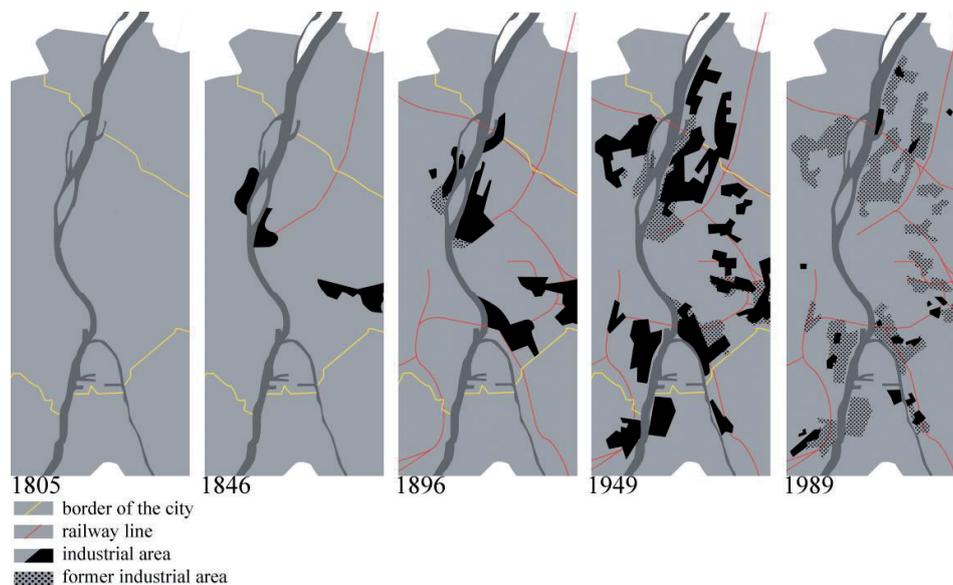


Fig. 1. Industrialisation and deindustrialisation of the Danube riverbank in Budapest (Figure by Márton Garay)

“honeymoon period”, normal daily life arose between them. [10] They became well-synchronized, although, the industrial areas outgrew Budapest’s riverbank and its natural environment; conflicts and difficulties appeared. Meanwhile, the global world changed, and in the contemporary hypertext society, [1] the traditional industry of the “Danube river banks” is incompatible. According to our approach, we divided the historical overview into five sections (Fig. 1):

1. Beginning of industrialisation and urbanisation 1805-1846 (between the first comprehensive regulation plan of Pest and the opening of the first Hungarian railway line)
2. Railway development 1846-1896 (between the inauguration of the first railway line and the construction of the complete rail system with Danube bridges)
3. Industrial growth and mass rural inward migration to Budapest 1896-1949 (between the Millennium and the nationalisation)
4. State-led industrialisation and modern urbanisation 1949-1989 (period of the Hungarian People’s Republic)
5. Post-industrial and post-communist development since 1990 (from the change of political and economic regime)

## 2.1 Beginning of industrialisation and urbanisation 1805-1846: Between the first comprehensive regulation plan of Pest and the opening of the first Hungarian railway line

The first comprehensive regulation plan of Pest was created in 1805 to control the beginning of urban development, and the construction needs of the growing population and their commercial activities. It is evident that the history of the city is always interconnected with the transport and storage techniques for people, information and goods. At this time, the most secure way to deliver goods at a distance was to carry them on a waterway. For this reason, the main hubs of the city’s commercial life

were the Danube’s harbours on the disordered riverside. To regulate the situation that was also of importance at national level, the Palatine of Hungary, Archduke József asked József Hild to define a general regulation and renewal plan for Pest city. The plan, beyond the settlement of the harbours, also included regulation for roads, allocation of public works and establishment of future industrial areas linked to the river. [16]

Industry was located near the waterfront for practical reasons. The raw material for production arrived on the Danube to the site, and it was economic to process it directly in the harbour’s surroundings. With a well-chosen riverbank location, not only could the transportation of raw material and manufacturing be reduced within the city, but also the water supply was directly ensured for production process. Due to regulated industrialisation and urban growth, the landscape of Pest rapidly changed. Earlier, only local industries were typical (quarries, clay pits, workshops and small works integrated into housing), but by the beginning of 1800s, the first sawmills, flour mills and various small machine factories appeared. On the Danube riverbank, the first actual company was the Óbuda Ship Factory opened in 1835; some years later, in 1841, a roller mill was established at Pest. Not only were the needs of the city served by these new institutions, but also they were directly linked with their products to the markets of the Habsburg Empire. In the 1840s, the industrialisation of the country changed dimension; the first Industry Association was created in 1841, its members organised the first Hungarian industrial exhibition in 1842, established a Factory Founding Society in 1844 and opened more than 60 new factories. In Pest, next to the Danube, in the new district of Lipótváros, a real industrial zone was born composed of Valero with 100 employees, a roller mill, Vogl furniture and the Kemnitzer baize factory. Under these circumstances, it is evident, that the starting point of the Hungarian railway development would be the same urban site.

## 2.2 Railway development

### 1846-1896: Between the inauguration of the first railway line and the construction of the complete rail system with its Danube bridges

The appearance of the railway was decisive for the capital's industrial development, because of its economic and geopolitical significance. The goal was to link to the growing European rail network and readily access harbours (the Adriatic Sea) and mining areas (Carpathians) of Hungary. With the completion of rail network, the country's main delivery lines changed; Pest became the hub of a star-shaped national transport infrastructure and the Central-European importance of the city grew. [8] The first Hungarian railway opened between Pest-Vác in 1846. The terminus in Pest, the station of "Pesti Indóház", was located at Gyár (Factory) Street (now Jókai Street) near the former northern city border of Pest. Railway and industry developed simultaneously there; old fields and orchards were replaced with factories, mills and warehouses. [8,13] The surroundings of the new and planned railway stations appreciated in value. While nearby, the Váci út sawmills and steam mills were typical; next to the Józsefváros station, the Ganz railway carriage factory, the Hungarian Royal Machine Factory and the main workshop of the Hungarian State Railways were built.

The urban character of the railway served areas changed immediately. Available land for industry was soon, however, the persistent demand resulted in new development areas. The service for potential industrial land far from railway stations was solved by the configuration of industrial tracks. Among the tracks, factories and works lined up in creating the city's first unified industrial zone. This process can be observed on the northern (Lipótváros, Óbuda) and southern (Ferencváros) sides of the river. The rail line of Szabadka (built in 1882) was the main delivery road for agricultural goods coming from the southern areas of Hungarian Great Plain. The tracks ran until the border of the inner city (Kiskörút). The customs area was in the building of today's Corvinus University. The completion of the rail line system was followed by the construction of the Ferencváros Railway Station, which was the country's largest railway yard. At the same time, the most important railway yard serving food was also built, the so-called Railway Station along the Danube. Nearby, estates, factories and other industrial institutions were formed, and with their industrial lines were directly attached to the most important rail zone of the country.

The industrialisation and urbanisation changed the city's economic, social, physical and natural context over just a few decades. The distances, growing population and lifestyle had new needs for mobility, living and activities. Consequently, public transport became indispensable. The first horse tramway started to function along Váci út, parallel to the Danube, in 1866; the suburban railway transport, the HEV was created in 1887. Most of the lines follow the river, North Buda (HÉV Szentendre), South Pest (HÉV Csepel, Ráckeve) and South Buda (HÉV



Fig. 2. The factory of "Első Óbudai Szeszegető és Finomító Részvénytársulat" in Óbuda, built in 1867. (Photo by Márton Garay)

Budafok) came to be served by the new railway. In every direction, industry could readily develop between the waterway and railway [3,15] (Fig. 2) being connected to housing areas.

## 2.3 Industrial growth and mass rural in-migration

### 1896-1949: Between the Millennium and nationalisation

The restructuring of industrial technologies, such as converting wood-based production to coal-based, had an outstanding effect on the industrial land of Budapest. By the turn of the century, the processing of raw material was no longer strictly attached to the point of exploitation, as access to industrial areas was solved with the newly completed railway and industrial track network. At this time, except to the west, the capital was surrounded by industrial zones, which significantly determined urban development. The industrialisation required, and at the same time resulted in an increase in the city's population. While in 1869, Pest and Buda had approximately 280 000 inhabitants, by the turn of the 20th century their number was 700 000 and over 41 percent of the active workforce worked in the industrial areas. [16] Industrial development was promoted by several regulations, through free taxes or absolute industrial freedom. In addition, the minister of commerce Gábor Baross introduced a new railway tariff system based on zones, which ensured suitable circumstances for long-range haulage. The beginning of the First World War also had a positive effect on industrial development, as a large labour force was required for military production.

In 1900, 68 502 people worked in factories; in 1910, this number was nearly double. By the 1910s, Budapest became one of the most powerful industrial centres in the Central-European region because of the encouraging commercial politics and the changes in the world economy.

Besides the old industrial areas near the Danube (Óbuda, Northern Pest, Southern Pest), new industrial lands were created in Újpest, Csepel, Budafok and Kelenföld. In Újpest, the leather industry, wood industry and ship manufacturing were essential. Meanwhile in Csepel, a free port was built that connected the city with the sea, and the Weiss Manfréd Factory became an internationally well-known complex for heavy industry. On the Buda side, in Kelenföld, the roller mill and the power plant



Fig. 3. Danube and industry, Budapest, 1940. (Photo by Fortepan)

established new institutions, and Budafok became the area for beer, wine and champagne production. The most important factories also had a direct railway connection. It was reasonable to divide goods transportation and passenger traffic using the same railway lines; however, in several cases transfer and passenger stations functioned separately. In Pest, the Lipótváros transfer station served the northern industrial area, the Ferencváros and Duna stations, the southern part of the city. (Fig. 3)

Simultaneously with the growth of huge industrial zones around the former city centre, the deindustrialisation of the changing centre became necessary. The first industrial lands close to the inner city disappeared gradually. For example, while at the end of the 19th century, timber yards and roller mills functioned in Lipótváros, some years later, a new riverbank and the representative Parliament building was constructed in the same urban area. The urban character and land use changed immediately; the Pesti Hengermalom (roller mill) was relocated to the new industrial area in south Buda, in 1910. The territorial function change was similar in South Pest after the World War. It became evident that the goods station in the surroundings of Boráros square obstructed the city's spatial improvement. Despite this, the rail and storage areas continued in use, and this part of the Danube bank was not integrated into the residential zone. The areas closer to the inner city rail transport were not re-established after the war's destruction; in the areas south of Petőfi bridge, the increasingly unused railway system was not dismantled for a long time. [18]

## 2.4 State-led industrialisation and modern urbanisation 1949-1989: Period of the Hungarian People's Republic

The Second World War majorly damaged Budapest's industry. Because of the bombardment, nearly one-third of the industrial buildings were totally devastated, and the remaining severely damaged. Although, production restarted quite soon after the war, the lack of labour, raw material and energy

was constant. The communist system, established in 1949, had a contradictory impact on industry. Business and proprietary structure changed utterly, small and middle-sized companies ceased, factories and workshops were all nationalised. Consequently, natural competition between different companies ended. Due to state regulation of the market and lack of resources, technological development and innovation were unimportant. [3] On one hand, stagnation and amortisation was typical in the industrial milieu, but on the other, a forced industrialisation characterised this period. For this reason, between 1945 and 1960, the number of industrial jobs increased from 77 000 to 600 000 in Budapest. In the 60s, the high concentration of industry in the capital required a restriction on the new industrial lands, which affected the industrial areas near the river. Along the Danube, the areas close to the inner city were undergoing a graduated functional change while, in the outskirts, expansion of industrial areas was typical. At this time, the development of industry was the highest in the history of Budapest. The environmental and social problems caused by industry was recognised in the 60s, and one of the goals of the Second Five-Year Plan of Budapest (1961-65) was the deindustrialisation of the historic city centre. For this reason, by the 70s factories disappeared from the well-located riverbanks of Lipótváros and Óbuda-Újlak, and large housing estates replaced the industrial use. To produce the prefabricated concrete panels for the construction of modern housing estates, new industrial areas for these factories appeared on the outskirts, for instance in Óbuda and Újpest. Nevertheless, the urban landscape of the Budapest agglomeration changed dramatically. Besides new industrial buildings, the modern functional urbanisation produced globalised urban elements: large housing estates and the infinite suburbs. [17] During this period, the traditional railway, and tramway system was completed by the metro lines 2 and 3, ensuring the infrastructure of the city by connecting working places and housing areas. The industrial zone between the historic city centre and the outskirts became increasingly dense, physically chaotic and psychologically "non-places" for inhabitants, even the banks of the Danube. (Fig. 4)



Fig. 4. Nature and industry, Budapest, Népsziget 2014. (Photo by Zsófia Kun)

## 2.5 Post-industrial and post-communist development from 1990: (from the change of political and economic regime)

In 1989, due to the political revolution, the structure of the economy changed. From the 90s, a significant setback has occurred in industrial production as well in investments. Large companies fell apart, and as a consequence, production completely stopped in several factories; meanwhile, in other places, production continued with a new profile [3] The age can be described by two contradictory but parallel processes. On one hand, the deindustrialisation was significant: many industrial sites were abandoned and privatised waiting for new functions. The Váci road transformation is a relevant example. This well located and well-connected city zone, parallel to the Danube, changed quickly and became a new linear investment target area of the post-industrial developments (offices, institutions, shopping centres). Nevertheless, in this process, the Danube riverbank did not play an important role; it was just considered hinterland. Some industrial areas next to the river were partially or entirely renewed [14], searching for a new position in the national and international markets (for example the Herz salami factory at Soroksári or the Kelenföld Power Plant on the Budafoki road). As consequence, the proportion of land occupied by industry has decreased in recent decades. While in 1986, the scale of industrial zones reached 4536 hectares, which was 8.6 percent of Budapest's territory, by the turn of the millennium it was only 4-4.5 percent. [14] Huge areas became unusable in the urban fabric; their buildings and infrastructures (for example the existing track system) waited for new functions. (Fig. 5)



Fig. 5. Former Gas Factory on the Óbuda riverbank, 2012.  
(Photo by Márton Garay)

The question arose as to what kind of process would help the renewal of the abandoned brownfield sites? In the Budapest 2030 Long-Term Urban Development Concept that was published in 2013, the problem of brownfield sites is among the most significant topics. Following this strategic document, the municipality of the capital launched three thematic development programmes - the renewal of brownfield sites, the development of the Danube riverbank and social housing - searching

for a comprehensive solution. Instead of the commerce, industry and traffic that occupied the riverbank, in contemporary urban life, free time and recreational needs, environmental qualities and green mobility solutions are coming to the fore. This idea requires both the users' and the investors' attitudes to change in the utilisation of the city. In Budapest, the Danube zone is the principal target area for this new future.

## 3 Opportunity for sustainable development

To explain Budapest's morphology and urban growth, we can use the well-known classification offered for five different zones: the historic urban core, transition belt, mountain zone, outskirts and the distinct Danube zone. [7] The Danube zone overlaps with the others and unifies them in the urban landscape. In addition, it is characterised by three types of environment: the challenging brownfield sites are situated between the Unesco World Heritage central city riverside and the expanding underdeveloped natural riverbank of the outskirts.

There is a large volume of published urban studies describing the phases of urban development. [9;2] In the Hungarian literature, Enyedi has written the most complete synthesis of the stages of urban growth. [12] To summarise the varied land use along the Danube in Budapest, our method is based on Enyedi's global model.

The first relevant phase of economic development resulted in Budapest's urban explosion when industrialisation was the core. The Danube and the railway infrastructure catalysed the process. Thus Budapest became a modern European metropolis. During the second stage, the subsequent relative de-concentration in urban agglomerations (for example: Szentendre, Dunakeszi, Érd, Dunaharaszti), the development used the Danube as a natural value for housing and the existing railway system that maintained good connections between the new suburbs and the workplaces in the industrial zones. The third stage of urban change, the de-urbanisation started by the lack of industrial activity in Budapest, deeply touched the former industrial areas along the Danube. In Hungary especially, after the politic and economic change in 1990, the reprivatisation started at the same time as the deindustrialisation, and sites with a Danube riverbank had enormous development potential. Without city level coordination, individual projects were planned, some of them realised. [4] In the transition areas and outskirts of Budapest, the Danube zone became fragmented, neglected and under-utilized. Nevertheless, the fourth phase of urban development arrived simultaneously with the third one. This is the urbanisation of the global information society that encourages the de-concentration and maintains the large metropolitan areas. In this period, we can also recognise the re-urbanisation thanks to the urban renewal in the city centre, the presence of international investors and visitors.

It is now time for the re-evaluation of the former industrial areas sandwiched between waterway and railway. The Danube zone, with its excellent location, should be the catalyst for

Budapest's sustainable urban development. The site is connected not only to its geographical environment, where it came into being and developed throughout history, but also to its material and immaterial cultural heritage: railway, infrastructure, buildings and memories. Here, it is possible to recognise and use several essential components of urban sustainability, such as green mobility based on railway and waterway, the re-use of formerly urbanised sites, their amazing natural qualities and historic identity.

A significant element in the transforming land use is the reduced road traffic near the riverbank in the interests of better pedestrian access. For the same reason, it is important to start the renewal of the brownfield areas along the Danube as soon as possible, and to give new functions to former industrial buildings, which allows the free use of the riverside and ensures community functions (Fig.6). The riverbank's integration into city life may increase the value of the surroundings. This could financially improve the remote parts of the city in the real estate market.

A contemporary well-coordinated intervention will complete the existing facilities by developing the biking and walking system, creating dense, open, multifunctional and liveable urban fabric, using renewable energy sources, and changing attitudes to decrease energy consumption alongside reduced waste and pollution. [6]

#### 4 Conclusion

Between railway and waterway, in Budapest, the Danube zone is in a unique situation. Industrial use is gone forever,

former values have disappeared, and sites are neglected. The economic crisis in 2008 halted grandiose project ideas and the area has slept. Meanwhile, this status has provided the opportunity for new developments that can be guided in a more context-sensitive and sustainable direction. Temporary or definitive urban and architectural solutions are needed to create and improve the river environment's attraction, to remember the historic identity, enforce the tools of green mobility, and for the first time in this story, integrate the entire Danube zone into the everyday life of Budapest.



Fig. 6. Visions for future – changing the function of the areas nearby the Danube (Figure by Krisztina Csirke, Izolda Font, Fanni Andriska, Balázs Demeter, Roland Füzi, Kristóf Vanyur, Józsa Katalin and Viktor Tóth)

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