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Industrial Narratives

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**Adaptive Strategies for
Dormant Industrial
zones in Novi Sad
(Serbia) and Rijeka
(Croatia)**

Mentorship prof. Valeria Fedeli
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Abstract

The realm of industrial activities undergoes constant innovation and transformation across virtual, sociological, and physical dimensions. Urban planning and architecture play a crucial role in examining the intricate relationship between production activities and surrounding spatial contexts. Successfully integrating appropriate industrial sectors, manufacturing facilities, and production processes into the urban fabric of contemporary cities presents a complex challenge. Rather than viewing industrial development in isolation, it is evident that the industrial character intertwines with urban identity and personal memory. Although dormant and vastly abandoned, central industrial zones in Novi Sad (Serbia) and Rijeka (Croatia) emerge as valuable spaces in the present-day urban fabric. Their transformative potential derives from their peculiar location within the urban composition, addressing contemporary needs and anticipating future development challenges. Simultaneously, the

independence of the post-Yugoslav republics recounts its own industrial story amid the challenging transition from a centrally planned to a market-oriented economy, leaving an indelible mark on the contemporary urban fabric. Once bustling and progressive industrial zones now stand as decaying and abandoned urban gaps. This paper acknowledges the significance of fragile industrial heritage and proposes its adaptive reuse, considering current economic and market trends characterized by the resurgence of production within urban areas, the process of de-industrialization, the expanding tertiary sector, digitalization, and modernization.

Keywords: Zone-breaking, abandonment, urban gaps, industrial heritage, collective memory, urban regeneration, strategic urban planning

Il regno delle attività industriali è caratterizzato da costante innovazione e trasformazione, che avvengono in diverse dimensioni, comprese quelle virtuali, sociologiche e fisiche. Di conseguenza, la pianificazione urbana e l'architettura svolgono un ruolo cruciale nell'esaminare l'intricata relazione tra le attività produttive e i contesti spaziali circostanti. L'integrazione riuscita di settori industriali appropriati, strutture manifatturiere e processi produttivi all'interno del tessuto urbano delle città contemporanee rappresenta una sfida complessa. Piuttosto che considerare lo sviluppo industriale come un aspetto sociale isolato, è evidente che il carattere industriale dell'ambiente di vita si integra nell'identità urbana e nella memoria personale. Sebbene dormienti e ampiamente abbandonate, le zone industriali centrali sono spazi preziosi nel tessuto urbano odierno sia di Novi Sad (Serbia) che di Rijeka (Croazia). Il loro potenziale trasformativo deriva dalla loro posizione peculiare all'interno della composizione urbana, affrontando le esigenze contemporanee e anticipando

le sfide future di sviluppo. Allo stesso tempo, l'indipendenza delle repubbliche post-yugoslave narra la propria storia industriale nelle circostanze di una transizione difficile da un'economia pianificata centralmente a un'economia orientata al mercato. Questa transizione ha lasciato un'impronta indelebile nel tessuto urbano contemporaneo. Le zone industriali un tempo vivaci e progressive sono diventate vuoti urbani decadenti e abbandonati. Questo articolo riconosce l'importanza del fragile patrimonio industriale e propone il suo riuso adattivo, tenendo conto delle attuali tendenze economiche e di mercato caratterizzate dalla rinascita della produzione nelle aree urbane, dal processo di deindustrializzazione, dall'espansione del settore terziario, dalla digitalizzazione e dalla modernizzazione.

Parole chiave: Rottura delle zone, abbandono, vuoti urbani, patrimonio industriale, memoria collettiva, rigenerazione urbana, pianificazione urbana strategica.

Content

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MASTER THESIS

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Adaptive Strategies for Dormant Industrial
zones in Novi Sad (Serbia) and Rijeka (Croatia)

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01

Introduction

1.1 Relevance

In response to economic, social, and environmental challenges, there has been a growing trend in Europe since the 1990s to engage in strategic spatial planning at the urban-regional level (Hersperger, et al., 2019). However, the inception of this process does not align uniformly across the historical timeline for all European countries, given the shift from a centrally planned to a market-oriented economy. As new trends shape the urban economy, the failure to adapt to these changes is apparent in Eastern European countries. This regression trend is also evident in the case studies analyzed in this thesis, where there is a lack of careful consideration and development of urban plans in line with contemporary standards and innovative thinking. The persistence of zonal planning without integration and exploration of new possibilities further underscores this issue.

On the turnover of the 21st century, all the transition countries of Europe have faced major challenges of the transitional crisis. The transition includes moving from a centrally planned to a market-oriented economy. The following crisis is characterized by a decline in production, consumption,

employment and productivity. Generally speaking, it negatively affects the entire living standard of society. The Republics of Croatia and Serbia, which were once a part of the Socialist Federal Republic of Yugoslavia (SFRY) (1943-1992) are no exception in this context (Veselica & Vojnić, 2000). Formerly productive industrial fringes situated in the city centre have now transformed into extensive areas of neglect and abandonment. Not only does it appear that there is insufficient enthusiasm to adapt these zones to contemporary needs, but there is also an overall absence of authoritative vision and programs for urban revitalization. Therefore, our interest in this topic stems from our academic perspective as members of transitional societies familiar with their urban challenges. When addressing dormant industrial zones, questions about neglect, abandonment, heritage, and demographic trends emerged. It came to our attention that developing a strategic urban plan for a new vision in these zones requires a thoughtful and context-related approach.

Despite selecting different cities (Rijeka, Croatia, and Novi Sad, Serbia)

as case studies within the regional context, we have aligned urban design strategies and perspectives with the theoretical framework of productive cities. The contemporary productive city is rooted in emerging sectors that are digital, service-oriented, low-carbon, knowledge-based, and connected to their cultural-industrial context. Therefore, the framework of the productive city offers a sustainable approach to urbanization within the delicate urban fabric, promoting a

circular economy (Mista Team, 2022). In both case studies, we have identified a growing potential to facilitate the expansion of current thriving tertiary industries within the existing urban context, rather than advocating for a new industrial direction in this thesis. In essence, the transformation of dormant industrial zones accommodates new industrial activities and integratively addresses highlighted urban contextual issues.

1.2 Background

De-industrialization and the absence of a forward-looking urban vision for the extensive dormant industrial zones are not merely isolated cases at the given urban scale. Considering the scale of the mid-size cities examined in this thesis, we acknowledge that the transformation of industrial zones can positively influence the entire urban identity and encourage further productive progress. Therefore, it is unsurprising that decades of neglect have sparked public debates both nationally and locally. In both urban contexts, persistent ownership struggles, a lack of collaboration between stakeholders, and bureaucratic inertia prevent the city from reinventing itself, despite previous intentions and efforts by independent groups (such as academic circles, independent political parties, etc.).

When it comes to the city of Rijeka (Croatia), as noted by the renowned architect and scholar Maroje Mrduljaš, *Rijeka is a city well-versed in self-awareness. The question that arises is, "What now?"* (Mrduljaš, 2023). During the METROPOLIS panel discussion on the perspectives of the new city, Mrduljaš highlighted various

academic initiatives in Rijeka aimed at raising awareness about its neglected areas and fostering a visionary urban framework. These include efforts like the EASA architectural workshop, the city's recognition as the European Capital of Culture, the establishment of postgraduate urban studies at the University of Rijeka, and the publication of the book "Fiume Fantastika" in August 2021. However, these endeavors seem insufficient to prompt the city authorities to adopt an integrative planning approach. Rijeka is currently at a crossroads, torn between its historical industrial identity and the emerging tourist-oriented hospitality identity. The lack of strategic planning is apparent and adversely affects urban trends. Notably, Rijeka faces concerning demographic trends in Croatia, with a significant outflow of young people and the workforce. Despite its historical prominence, the Port of Rijeka is now stagnant, awaiting a push towards modernity and new industries.

In the field of architecture, the year 2022 marked a significant milestone for Novi Sad as the General Urban Development Plan for the next 10

years was adopted. This overarching document establishes the strategy for the city's urban development by defining spatial purposes, boundaries of construction areas, and infrastructure construction. In a public discussion that involved, on one side, members of the public enterprise Urbanism (Dipl. Eng. Arch. Dušan Miladinović, Director of the Public Enterprise Urbanism – Institute for Urbanism Novi Sad, Dipl. Civil Eng. Olja Tomac, and architect Silvija Kancenberger), and on the other side, members of the independent Association of Architects of Novi Sad (Dipl. Eng. Arch. Miljan Cvijetić, Dipl. Eng. Arch. Slobodan Jović, and Master Eng. Arch. Dr Aleksandar Bede), a key question emerged that the members of the public enterprise Urbanism could

not answer: What is the precise vision for our city? (Silvija Kancenberger, et al., 2022) Despite the efforts of the Society of Architects, public panels, and discussions, a plan was adopted. This plan relies on high density and zoning principles, leading to potential drawbacks such as reduced energy efficiency, lower architectural design quality in new buildings, insufficient green spaces, limited public facilities, and a lack of well-planned infrastructural corridors. These factors collectively impede the city's progress toward sustainability. The city has been negatively affected by the impact of political decisions, private investment interests, and inadequate management within the urban planning institute.

1.3 Research Question

The dynamic landscape of industrial activities within contemporary urban settings has prompted a critical examination of the relationship between production processes and the surrounding spatial contexts. This inquiry is particularly relevant in the case of Novi Sad (Serbia) and Rijeka (Croatia), where the dormant industrial zones, once bustling hubs, now stand as valuable yet neglected spaces within the urban fabric. In the wake of a challenging transition from centrally planned to market-oriented economies, these cities struggle with the complex task of revitalizing their dynamic landscape of industrial activities within contemporary urban settings, which has prompted a critical examination of the relationship between production processes and the surrounding spatial contexts.

Our research seeks to unravel the transformative potential of these dormant industrial zones, emphasizing their unique locations within the urban fabric, responsiveness to contemporary needs, and anticipation of future development challenges. At the heart of our investigation lies a central question: **“How does the transformative**

potential of dormant industrial zones, influenced by their unique location within the urban fabric, contemporary needs, and future development challenges, contribute to the urban identity and memory in Novi Sad (Serbia) and Rijeka (Croatia)?”

The research question addresses a critical intersection between urban development, industrial heritage, and the adaptive reuse of dormant industrial zones in Novi Sad (Serbia) and Rijeka (Croatia). This question is essential for several reasons:

Preservation of industrial heritage

The dormant industrial zones represent a unique historical and cultural heritage that could be lost if preserved, repurposed, and recovered. Understanding how these spaces contribute to urban identity and memory is crucial for preserving the industrial history embedded in the urban fabric.

Urban identity and memory

The research question dives into the transformative potential of these dormant industrial zones and their

impact on urban identity and memory. Recognizing and adapting these spaces can contribute to a more holistic understanding of the city’s history and evolution, fostering a sense of continuity and connection between past and present.

Adaptive reuse and sustainable development

Investigating the transformative potential of given industrial zones addresses the current global discourse on sustainable development. The adaptive reuse of such spaces aligns with sustainability principles, promoting the efficient use of existing resources and minimizing urban sprawl.

Influence on future urban design

Understanding how to integrate dormant industrial zones into contemporary urban planning can influence future local and regional design practices, fostering more sustainable, culturally rich, and economically viable urban environments.

Local and global impact

Focus on specific cities, Novi Sad and Rijeka, adds a localized perspective to a global issue. While addressing

these cities’ unique challenges and opportunities, research can also contribute to global discussions on urban development and adaptive reuse practices.

Policy implications

The insights gained from research may have policy implications for local governments and urban planning authorities. Recommendations for policies that support the adaptive reuse of industrial zones can directly impact the sustainable development of cities. Educational and knowledge transfer The insights gained can enrich the existing body of knowledge in fields such as urban studies, architecture, and heritage preservation.

1.4 Methodology

Research Approach

Our research used a comparative method to investigate urban landscapes in Novi Sad (Serbia) and Rijeka (Croatia). This allowed for a detailed understanding of the distinct challenges faced by each city, while the comparison helped identify common trends.

Research Philosophy

Research philosophy focused on thoroughly examining current urban trends, policies, and dynamics in both cities. This approach aimed to provide a realistic picture of each case, offering insights for practical implementation strategies. By exploring the existing urban fabric, we wanted to bridge the gap between theory and practice in urban design.

Data Collection Methods

1. Surveys

Surveys were a critical method for collecting quantitative insights from residents and stakeholders in Novi Sad and Rijeka. These surveys aimed

to capture perceptions, preferences, and concerns related to the urban environment.

2. Map Researching

In-depth map analysis was used to understand spatial characteristics, historical development, and current distribution of industrial zones in both cities. This method contributed to a thorough spatial assessment.

3. Researching Public Agenda and Policies

To provide context, we examined public agendas and policies at local, regional, and national levels. This qualitative approach offered a deep understanding of the regulatory landscape and goals set by urban planning authorities.

4. Communication with Prominent Architects and Subject Experts

Engaging with prominent architects and individuals with expertise in our research domain allowed for collecting qualitative insights. Their perspectives enriched our understanding of challenges and potential solutions for the adaptive reuse of industrial zones.

5. Literature Review

A comprehensive literature review focused on studies with similar research questions, providing a theoretical foundation and comparative framework. This approach ensured that our research was grounded in existing scholarship while contributing to ongoing academic discourse.

Guidance and Mentorship

Our mentor professor provided guidance throughout the research process, offering valuable insights and methodological direction. Additionally, external input from professors at the

Faculty of Technical Science (Novi Sad) and insights gained from our research at the urban design studio at Politecnico influenced our methodological choices.

Limitations

A significant challenge in our study was the limited availability of precise data from government sources. This made our data analysis less comprehensive. We worked to address this challenge by cross-referencing and combining information from various sources.

1.5 Thesis Framework

In this section, we will detail the conceptual framework within which the study operates. This includes an exploration of relevant theories and the definition of key concepts. We will define and contextualize essential concepts pivotal to the study, ensuring clarity and coherence in the subsequent chapters.

Chapter 02 Reviewing the Socialist Heritage

Chapter 02 presents a thorough exploration of the historical, industrial, and sociopolitical context essential for comprehending the dormant industrial zones in Novi Sad, Serbia, and Rijeka, Croatia. The narrative starts by emphasizing the intrinsic role of industrial development in shaping urban identities and personal memories, showcasing the complex urban composition of contemporary cities influenced by shared historical

landmarks, infrastructure, housing, and industrial facilities. This discussion is contextualized within the transformative potential of dormant industrial zones, rooted in their unique location, contemporary needs, and future challenges, particularly during the socialist era of the Socialist Federal Republic of Yugoslavia (SFRY).

03 Understanding the Current Urban Dimension of Novi Sad and Rijeka

Chapter 03 provides an in-depth examination of the present urban characteristics of the selected cities, commencing with an analysis of the urban context, demographic and social trends, and an exploration of urban layers in terms of scalability, morphology, and natural elements. Additionally, a thorough investigation into the current 10-year urban plans for the selected cities revealed

essential elements for establishing a local urban identity and the standpoint of local stakeholders and authorities. Furthermore, the critique faced from opponents enabled a comprehensive understanding of the plan's limitations, particularly concerning our final masterplan agenda. This chapter also delves into the prevailing economic trends and key stakeholders, aiming to comprehend the implications of the transition process in each context. This understanding facilitated the assimilation of new industry trends and the theory of the productive city into the unique local context. A pivotal revelation in this chapter identifies the principal challenges within each urban context and acknowledges the need for Strategic Urban Planning, encompassing both plan formulation and implementation phases. Consequently, our chosen approach involved redefining the industry as a

tool for influencing Strategic Urban Planning in each city. The focused exploration of the current industrial landscape in both cities permitted the identification of a strategic industrial branch. Upon this selection, further investigations into its history, evolution, and contextualization unveiled the most problematic and intriguing zones, representing current urban gaps in the case study cities.

04 Framework of the Productive City

Chapter 04 presents the concept of de-industrialization, a prevalent trend in many European cities attributed to the expansion of the tertiary sector. It advocates for the reintegration of production into urban areas through the design of multifunctional spaces and mixed-use neighborhoods. The research conducted by Mista Team, ESPON 2022, played a pivotal role

in establishing the theoretical and empirical foundation for the exploration of already implemented projects in major European metropolitan centers. This chapter serves as a linkage between the current industrial landscape in the selected cities and a novel approach to revitalizing it, aligning with local socio-economic trends.

05 Industry as a Catalyst of Urban Changes

Chapter 05 initiates a case study of each city, examining the vast and currently industrial urban areas that are dormant and significantly overlooked. In the case of Rijeka, the focus is on Milutin Barač Street, commonly referred to as Industrial Street, which serves as the pivotal element for urban transformation in the dormant western wing of Rijeka Port. In the context of Novi Sad, attention is directed towards Working Zone North III within the Port

of Novi Sad. A concise analysis of the expansive and targeted urban context introduces the primary characteristics of the selected areas.

06 Urban Design Strategy and Proposal

Chapter 06 delineates the primary urban design strategy and concept, along with the objectives and goals achieved through the implementation of the listed design principles. The commonality of challenges faced in both urban contexts has facilitated the development of a proposed timeframe plan spanning 1, 5, and 10 years, grounded in the principles of the Strategic Urban Planning approach. Subsequently, preceding the presentation of Masterplan guidelines, the process leading to the finalization of the Masterplan is elucidated through diagrammatic map schemes, illustrating the reimagined built environment and

mobility system in alignment with the ultimate proposal. In this context, the Masterplan serves as a blueprint for local architects, stakeholders, and planners to build upon. Its purpose is to furnish a framework for action, juxtapose various scales and uses (as observed in the urban sections), and envision specific intimate scenarios (as depicted in visuals) seamlessly integrated into the urban grid.

02

**Reviewing the Socialist
Heritage**

2.1 The Role and the State of the Industrial Heritage

Rather than observing industrial development as an isolated societal aspect, it is evident that the industrial character of the living environment becomes integrated into the urban identity and personal memory. The urban complexity of selected contemporary cities arrives from the multi-layering of historical landmarks, infrastructure, housing and industrial facilities. Various industries have shaped the urban landscapes of these cities and the identity of their residents. Although dormant and vastly abandoned, central industrial zones are valuable spaces in the present-day urban fabric of both Novi Sad (Serbia) and Rijeka (Croatia). Their transformative potential derives from their peculiar location within the urban composition, contemporary needs and future development challenges. The industrial story observed within the framework of this paper originates somewhat in the 20th century and is mainly focused on industrialisation under the socialist political authority of the Socialist Federal

Republic of Yugoslavia (SFRY) (1943-1992). Simultaneously, the independence of the post-Yugoslav republics narrates its own industrial story under the circumstances of a challenging transition from a centrally planned to a market-oriented economy.



Figure 2.1 Collage of various abandoned or partially used Yugoslav industrial heritage

2.2 Geopolitical and Historical Context

The wider geographical region of southeast Europe, popularly called the Balkans (Balkan peninsula), was historically restless. Its multiethnic, multi-religious, multilingual and multicultural character was subjected to many imperial divisions, occupations and interpretations. Various historical rearrangements within this region prove that the unsettled question of identity, belonging and collective memory is still relevant (Janinović, 2020).

Twice there was a country named Yugoslavia. The first one was during an interwar period known as The Kingdom of Yugoslavia (1918-1943) and the second one was established in the aftermath of the Second World War. The Federal People's Republic of Yugoslavia was proclaimed and led by the newly established communist government. It was the confederation of six republics (Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Slovenia and Serbia) and was renamed the Socialist Federal Republic of Yugoslavia (SFRY) in 1963 (Janinović, 2020). It is the country to which media, scholars and most of the people nowadays refer when discussing "Yugoslavia" and its legacy. Led by the charismatic socialist dictator

Josip Broz Tito (1892-1980), the country based its political identity on its distinctive socialist experiment, combining elements of both the Soviet ideology and the Western free-market system (Janinović, 2020). Upon its establishment, the young union of the federal republics was vastly underdeveloped and agrarian with huge regional differences. Moreover, the illiteracy rate was extremely high due to the lack of distribution of institutional education (Dobrivojević, et al., 2014). Nevertheless, the strong political aim for empowering, industrialising and modernising the country vastly succeeded in the second half of the 20th century. The industrial background of individual cities within this territory was historically a subject of a wider geopolitical European context. Specifically, the early industrial activity in both Novi Sad and Rijeka began in the 19th century under the rule of the Austro-Hungarian Empire. After all, the catastrophic consequences of the rupture of the country emerged in the 90s.



Figure 2.2 Museum of Yugoslav History in the 60s (Source: *Once Upon a Time in Yugoslavia*)

2.3 Industrialization of the Workforce

As the Communist Party of Yugoslavia took over in the 40s, the rapid process of industrialization began. All private companies have been nationalized as the government has looked up to the Soviet economic model. The First Five-Year Plan in 1947 anticipated investments in electrification, construction of hydroelectric power plants, metallurgy, chemical industry, mechanization of mining and construction infrastructure. However, the gap between the

ambitious national development aims and the poor prerequisites led to foreign financial aid. The Yugoslav budget received half a billion dollars of economic aid and 800 million dollars of short-term and mid-term loans, but it was still insufficient to achieve industrialization objectives. The plans of the government of pursuing industrialization at all costs had negative consequences on the Yugoslav economy. Thus in 1953, one-third of Yugoslav exports was spent on

paying due instalments on loans. When it comes to labour itself, the Soviet model of manual labour was highly valued and it was the main measure of patriotism. Women's emancipation played an important role at that time. Women won the right to vote in 1945 and the process of their emancipation was initiated by mass employment popularized by the state. The division between gender labour was fading and women would often be involved in hard manual work.

The 1960s gradually brought an increase in living standards. The ameliorating living conditions were the result of abandoning the unsustainable industrial model, greater investment in the light industry, and development of the tertiary sector investment in real estate construction and infrastructure. Furthermore, the economic reforms (1961, 1965) reduced state intervention in the economy and private entrepreneurship was allowed. However, low agricultural production,

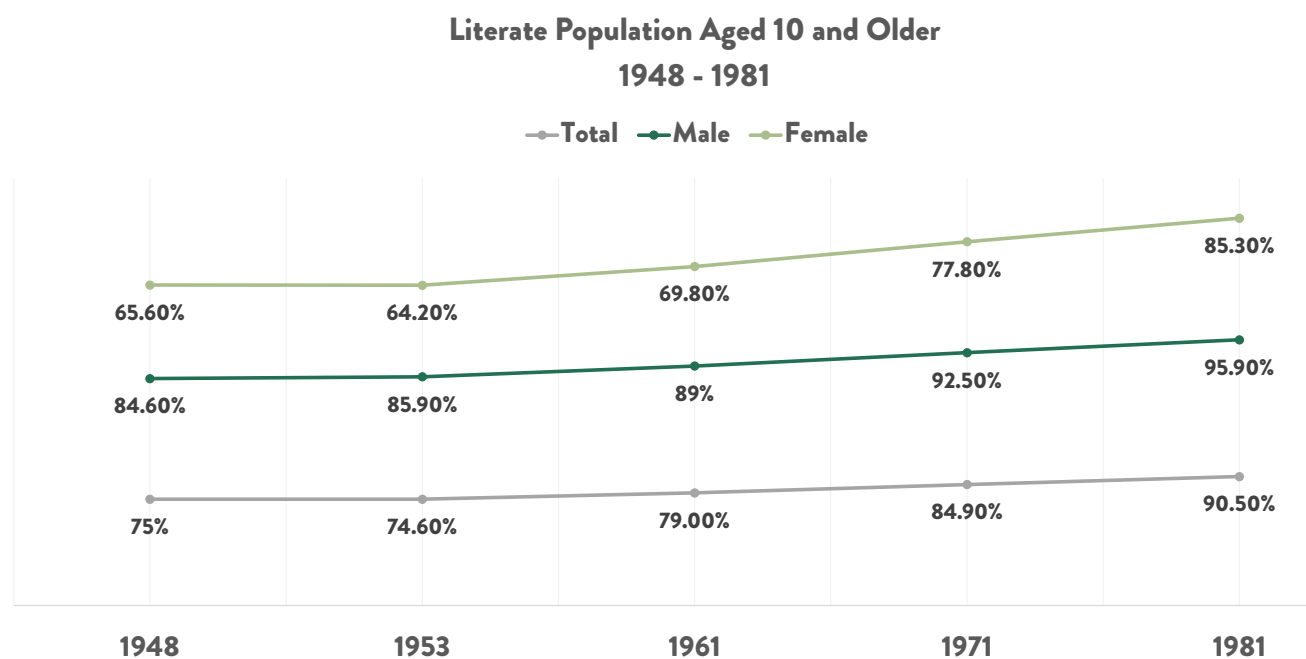


Figure 2.3 (above) Literate Population Aged 10 and Older 1948-1981 (Source: Dobrivojević, Duda, Mihelj & Panić, 2014. They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia)



Figure 2.4 Brotherhood and Unity Highway (Ljubljana - Zagreb section) in the 50s (Source: Once Upon a Time in Yugoslavia)

O2 Reviewing the Socialist Heritage

independence from foreign loans and imbalance in regional development were the main causes of failure. Moreover, self-management was not the long-term solution due to the increase in bureaucratization and failed investment.

The increase in oil prices in the 1970s created new obstacles for the Yugoslav economy. Measures of reduction and money from foreign loans somewhat balanced the situation. Despite

the modernization of industry and production, the growing economic crisis widened the gap between the republics. Unequal regional development sparked already existing political tensions.

The next big wave of the recession hit Yugoslavia in the 1980s. The outdated industry became largely non-competitive and the trade was not properly balanced with foreign countries. Therefore, economic growth turned into a recession in 1983.

Ineffective measures from the running elite did not result in long-term stability. These measures included a reduction in imports and a freezing of both salaries and prices. Correspondingly, in the mid-80s Yugoslavia had 18% of unemployment, high foreign debts and a high inflation rate.

New reforms proposed by the Parliament in 1988 came too late in the midst of the national tension that finally led to the disintegration of Yugoslavia in

1991 (Dobrivojević, 2014).

Percentage of Agricultural Population in the Total Population 1948 - 1981

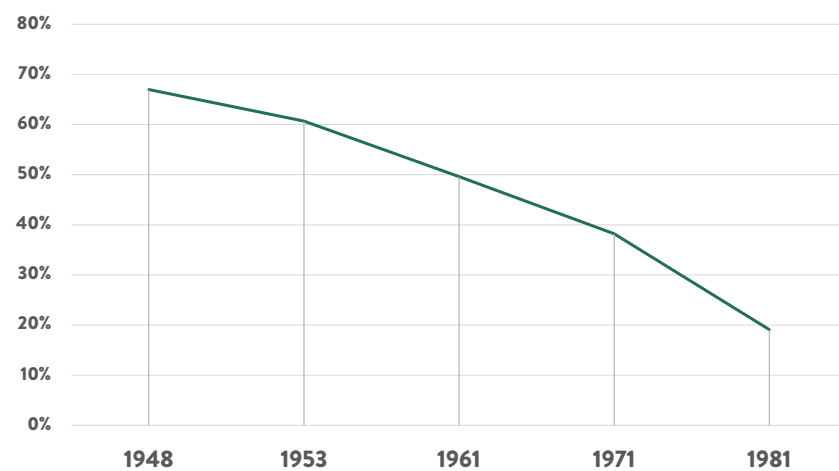


Figure 2.5 Percentage of Agricultural Population in the Total Population 1948-1981 (Source: Dobrivojević, Duda, Mihelj & Panić, 2014. *They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia*)

Percentage of Urban Population in the Total Population 1948 - 1981

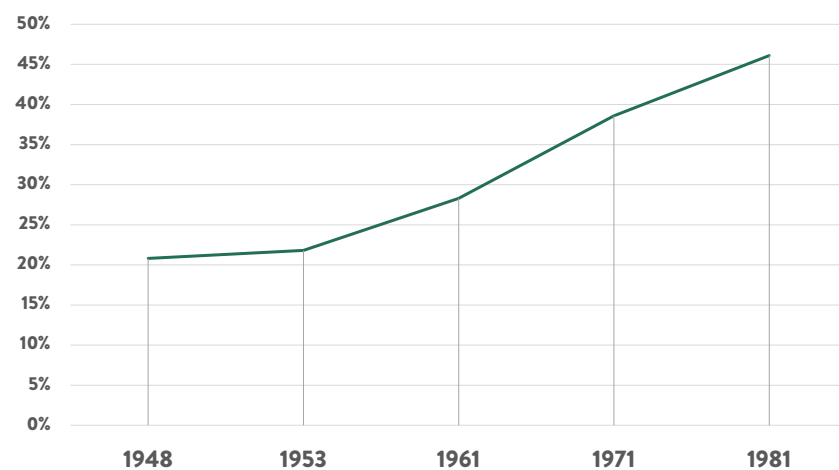


Figure 2.6 Percentage of Urban Population in the Total Population 1948-1981 (Source: Dobrivojević, Duda, Mihelj & Panić, 2014. *They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia*)

Employment structure in percentage in SFRY

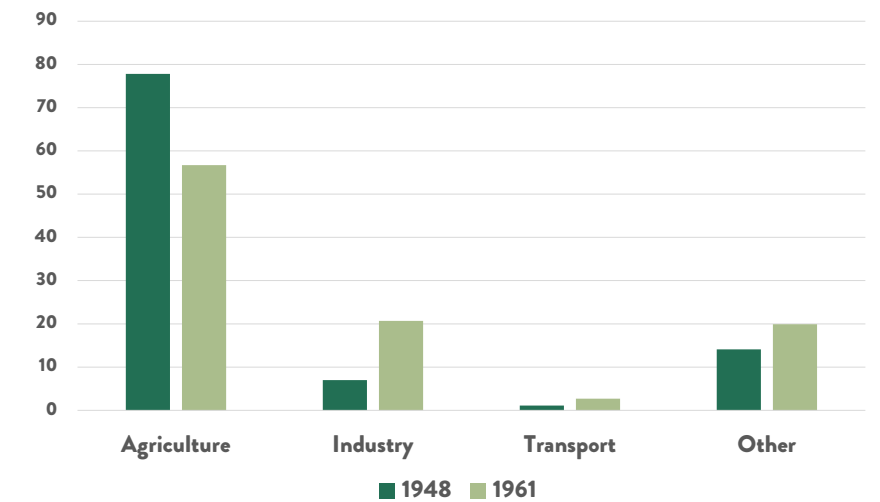


Figure 2.7 Employment structure in percentage in SFRY (Source: Dobrivojević, Duda, Mihelj & Panić, 2014. *They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia*)

Index of Real Personal Disposable Income 1952 - 1989 (1955.=100)

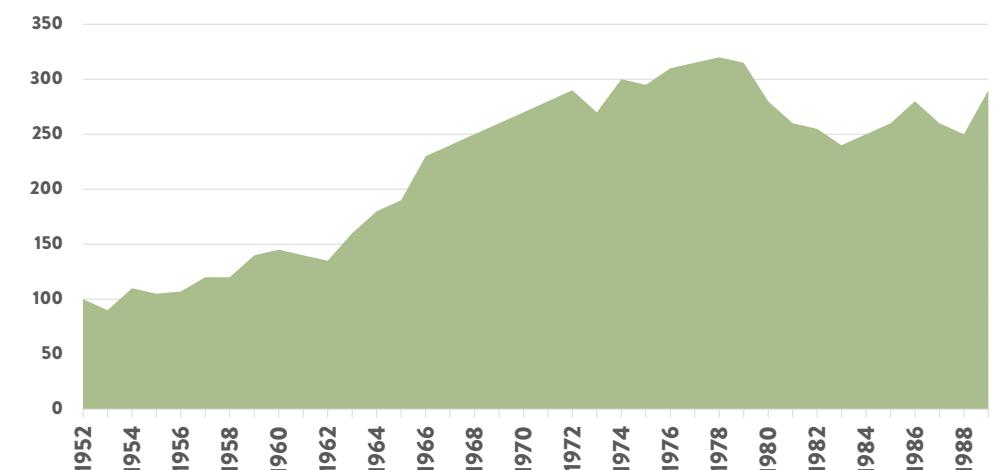


Figure 2.8 Index of Real Personal Disposable Income 1952 - 1989 (1955.=100) (Source: Dobrivojević, Duda, Mihelj & Panić, 2014. *They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia*)

02 Reviewing the Socialist Heritage



40s

SHORTAGES

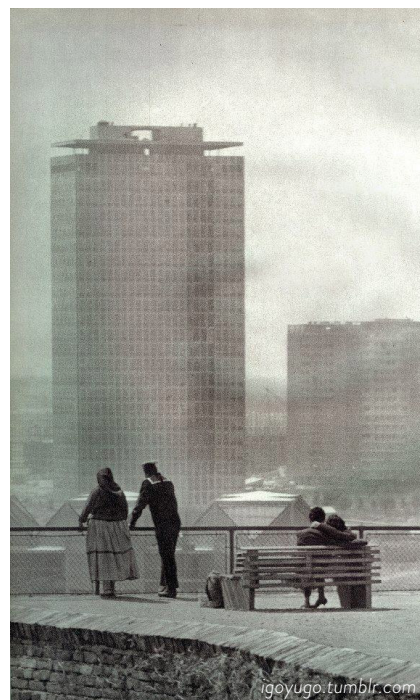


1948
○
crisis



50s

1954
○
miracle



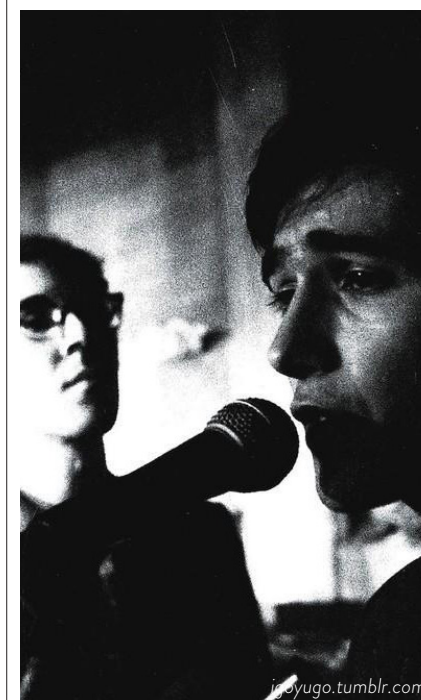
60s

1963
○
crisis



70s

1971 1974 1976
○ ○ ○
market growth, export debts



80s

SHORTAGES



crisis



90s

SHORTAGES



crisis & rupture



(Source: Dobrivojević, Duda, Mihelj & Panić, 2014. They Never Had It Better? Modernization of Everyday Life in Socialist Yugoslavia)

2.4 Urban Planning and Housing Construction

The two most influential trends in architecture in the post-war years were modernism and social realism. In the broadest sense, modernism represents a break with traditional forms and construction techniques. At the same time, architecture was understood as a tool for social reform. Socialist realism is a style that is promoted as a hybrid language under the slogan socialist in content, national in form. The Union of Soviet Socialist Republics (USSR) architecture sought to distance itself from everything modern in Europe through this style, but still, it was challenging to define social realism. Modernism has become a desirable style and trend in the reconstruction of European cities. These cities wanted a new beginning in the search for the oblivion of cowards. This issue of rebuilding cities was especially challenging for SFRY which was supposed to unite different nations that looked at each other through gunpoint until recently. As a national style, modernism was suitable for unifying needs (Konstantinović, 2018/2019).

The basic principles of modernism were set by the founding of the International Congresses of Modern Architecture (CIAM) in 1929. At the IV International Congress of Modern Architecture (CIAM) in 1933, new laws on the city's urban planning were adopted: housing, work, leisure, and traffic. The conclusions of the CIAM session had a very significant impact on the architecture of many countries: Switzerland, France, England, Germany, Austria, Belgium, Hungary, the Netherlands, Spain, Poland, Czechoslovakia, SFR Yugoslavia, Brazil, etc. Shortly after this meeting, Athens Charter (1931) was published anonymously by Le Corbusier, relying on the conclusions from Athens. It contains a set of recommendations in urbanism that regulate the construction of cities. The Athens Charter became the most influential document for planners of the 1950s and 1960s in Europe and the United States (Jencks & Kropf, 2006).

The Dubrovnik Conference of Architects and Urban Planners in 1950

was a turning point in the development of SFRY architecture. It has been established that modernism should be the main direction of action. Although Former President Josip Broz Tito was wholly aligned with the concepts of abstract art and modernism, he was flexible. He understood that it was not necessary to build according to his taste but for progress and peace. The First Five-year plan was planned for a period from 1947 to 1955. It characterizes the country's transformation from agricultural and rural to industrial and urbanized. In record time, a series of 47 general and regulatory plans of cities and settlements in SFRY were made to make and improve the existing towns, economic centres, industrial and workers' accommodations and resorts (Galjer, 2019).

For the next 30 years, the entire construction of SFRY was oriented to modern architecture and urban plans were based on the Athens Charter. Today, there are settlements in almost every city in ex-Yugoslavia, built according to the principles of the

charter: Alipašino field and Ciglane in Sarajevo, Vukovarska street, and New Zagreb in Zagreb, New Belgrade, and many others. All these settlements are now popularly called dormitories (Konstantinović, 2018/2019).



Figure 2.9 Construction methods of the New Belgrade in 1948 (Source: *Once Upon a Time in Yugoslavia*)

2.5 Societies in Transition

On the turnover of the 21st century, all the transition countries of Europe have faced major challenges of the transitional crisis. The transition includes moving from a centrally planned to a market-oriented economy. The following crisis is characterized by a decline in production, consumption, employment and productivity. Generally speaking, it negatively affects the entire living standard of society. The Republics of Croatia and Serbia, which were once a part of the Socialist Federal Republic of Yugoslavia (SFRY) (1943-1992) are no exception in this context. In the aftermath of the transition, the process of economic privatization caused social tensions. The wealth was kept in the hands of the minority which explains the relatively high Gini index of the focused countries (Veselica & Vojnić, 2000). Therefore, Croatia reports 29.2% and Serbia 33.3% in 2022 (Eurostat (EU-SILC), 2022).

Simultaneously, the industrial sector of the focused countries has faced a huge transitional barrier due to the collapsed economy and post-war challenges. Everything was happening at once in the newly independent republics after the rupture of The Socialist Federal Republic of Yugoslavia. A new organizational

structure was waiting to be established. That included diplomatic discussions, the establishment of the political hierarchy, institutional organization, and monetary system among many others. The vast industrial complexes were subjected to privatization which was not a transparent process. The narrow interests of the individuals, nepotism and the lack of a legislative framework harmed social justice (Veselica & Vojnić, 2000). Therefore, overall industrial progress stagnated due to many reasons. Some reasons are grounded in poor management, lack of public interest, lack of investments or the obsolescence of industrial technology.

It has now been three decades since the transition for both republics. However, the complex ownership background of the industrial complexes and zones did not allow their transformation. In most cases, these zones remained dormant and abandoned or partially used. Nevertheless, industrial heritage represents a vulnerable legacy that tends to decay due to its size and complexity, lack of public awareness of its protection, documentation loss and environmental protection (Cossutti, 2019).



2.6 History, Memory and Heritage

It seems that the abandonment is not caused only by local politics and the economy. There is plenty of interesting scholarly material that deals with the collective memory of Yugoslav socialism (Janinović, 2020) (Dobrivojević, et al., 2014). Due to the historical violence that followed after the rupture of the socialist state, further narratives were mostly constructed in opposition to socialism and Yugoslavia. *Halbwachs*, a prominent French sociologist and father of the notion, in the post-humously published “*La mémoire collective*” argued that memory (both collective and individual) is a socially constructed phenomenon, which cannot be observed in an isolated and unbiased way, independent of the social context (Halbwachs as cited in Janinović, 2020). Both collective and individual memory of socialism and Yugoslavia in the light of the post-war years (the late 90s) was portrayed as negative in the newly independent republics. The recreation of national identities as the remedy for the war meant that socialism and Yugoslavia were perceived as failed ideologies, associated with oppression, conflict and affliction. Heritage sites are the sites of struggle over historical ownership and they are variously interpreted by

different groups. Therefore, most of the memorial sites related to communism and ex-Yugoslavia were displaced, destroyed or abandoned (Janinović, 2020). This is not only the case with industrial heritage but also with monumental, architectural, leisure, art, etc. sites and heritage of the socialist era. The inability to recognize the value of heritage and preserve it is a common issue in all post-Yugoslav republics.



Figure 2.10 (right) The present state of the abandoned Haludovo Palace Hotel on island of Krk, Croatia (Source: Lptoš on timeout.com)

03

**Understanding
the Current Urban
Dimension of **Rijeka**
and **Novi Sad****

Rijeka



3.1 Current Urban Agenda and Vision for Rijeka

3.1.1 Urban Context

Rijeka is the third largest city in the Republic of Croatia with around 128 000 inhabitants (2011) (City Council of the City of Rijeka, 2021). The urban development of the city of Rijeka is primarily linked to the historical development of its port and waterfront. It is, even to the present day, the most significant national port due to its favourable geographical prerequisites. Rijeka is situated in the Kvarner Bay on the north coast of the Adriatic Sea. That deep extension of the Mediterranean Sea into the central European continent has been of strategic importance throughout

history. Many important mobility routes have led through this node. Furthermore, favourable topographical and geographical factors have resulted in fertile industrial development. Some of the various industrial productions were linked to paper and food production, oil refineries, metal casting and metalworking plants, chemical industry, gas production, wood industry and torpedo factory, all together with the city port, shipbuilding, railroad and road construction (Orbanić, 2021).

Historical urban context can be tracked to prehistoric times. On the antique foundations of the municipality of Tarsatica, the medieval city Rijeka of St. Vitus was founded on the mouth of the Rječina River. Until the beginning of the

18th century, the city was protected by the walls. The peak of trading activities began to flourish again in the 18th century when Emperor Charles VI proclaimed Rijeka a free port. The city expanded towards the south and the west. The Rječina River was somewhat the natural boundary of the expansion towards the east which becomes a repeating division point within the ruling powers later in history (Palinić, 2020). The dominance of the Hungarian rule within the Habsburg Monarchy was evident in the treatment of the city of Rijeka as their gateway to the worldwide seas. Growing urbanization, industrialisation and infrastructure investments were not focused on the development of the historic city centre. The most significant urban expansion

from 1872 to 1896 was led by the military engineer Giovanni Ciotta who became the mayor of Rijeka. The tender for the regulatory plan of the city at the time has already located the railway and port facility zones while dividing the waterfront from the residential zone. The excessive rush of creating the tender proved to be disastrous for the city. The response from the urban planners was poor and no proposal was accepted. Apart from the unfavourable morphological foundations for such a heavy program, the existing public buildings and structures were not representative enough and did not meet the aesthetic criteria of the “New Rijeka” that was being created (Palinić, 2020). Despite the challenging beginnings, most of the port was

completed, as well as the railway and industrial plants on the western coast towards Istria in the last decades of the 19th century. The entire area along the Rječina River and the coast was devoted to transport and industry. Therefore, the urban expansion of the coastal area was adapted accordingly to the needs of transport, manufacturing and industry. Considering the narrow shoreline belt, the widening gap between the industrial waterfront and urban fabric resulted in linear urban expansion (Palinić, 2020).

Upon the fall of the Austro-Hungarian Monarchy in 1918, Rijeka and Sušak became a part of the State of Slovenes, Croats and Serbs with Zagreb as its capital, but shortly afterwards, it was occupied by the Kingdom of Italy. Historical division between Rijeka (Fiume) (Italy) and Sušak (Kingdom of Slovenes, Croats and Serbs with Belgrade as its capital) happened in 1924 and two urban poles started functioning individually (City of Rijeka, 2023).

In the aftermath of the Second World War according to the Peace Treaty of 1947 held in Paris, Rijeka got reunited with the Federal Republic of Croatia

within Yugoslavia. Rijeka (Fiume) and Sušak were again joined into a single town – Rijeka in 1948. Progressively after the post-war reconstruction, Rijeka took over the role of the most significant port of SFRY. Rijeka became the urban centre of Western Croatia (Istria, the Croatian Coast and Gorski Kotar). Industrial production is rapidly picking up – the shipbuilding industry, the paper mill, the oil refinery, the production of ship equipment and engines, the clothing industry, hydroelectric power stations and thermoelectric power stations. Simultaneously with the vast industrialization, urban growth followed. An Increased number of inhabitants and regional immigrants caused the urban expansion of newly constructed socialist quarters and suburban zones (City of Rijeka, 2023). To respond to the increasing number of workers in the city, the multi-storey residential skyscrapers became the most efficient architectural typology. Even though the uneven coastal terrain did not allow the development of a rational grid of socialist modernist neighbourhoods (such as New Zagreb or New Belgrade), the multi-storey blocks emerged in the cityscape (Turato, 2023).

Urban growth was interrupted by the political struggles of SFRY on the turnover of the 21st century. Naturally, it is not only the city of Rijeka that experienced stagnation and economic downgrade but each city of the collapsing socialist state. After the national independence, the long and complex transitional process from national to private ownership left a deep scar on the industrial heritage (City of Rijeka, 2023). Many industries and companies failed, and private ones emerged mainly in the hinterlands of the city creating so-called new industrial zones. Further urban expansion towards the hinterlands of the city was organically adapted to the configuration of the terrain. The built environment of the city nowadays is characterized by the lack of clear urban directives which is typical for the area of the Western Balkans, as elaborated by the university professor and researcher Maroje Mrduljaš in an interview on the exhibition *Balkanology: New Architecture and Urban Phenomena in South Eastern Europe* held by Swiss Architecture Museum in Basel in 2008.

The built environment always reflects political and economic processes,

especially in turbulent social circumstances. The disintegration of Yugoslavia and the socialist order led to the destabilization of institutions and the system of social values, and these are the two main sources that have influenced the processes in the built environment in the Western Balkans, where war destruction should also be taken into account. With the transition, the social value of expertise collapses, for which architecture is an excellent example. It was the first to collapse because investors, emboldened by the benefits of private property and the collapse of general culture, thought that they knew best what was beautiful, useful or appropriate and that they did not need the advice of an educated expert, especially since different forms of modernity and so on and modern architecture are associated with the egalitarianism advocated by the socialist order. From what has been described, it is clear how the private domain in all measures is progressing to the detriment of the public, and it is clear that this first happens in the field of construction, which depends significantly on the (self) will of the client, who becomes the absolute master within the perimeter of his plot (Mrduljaš, 2008).



urban layers

Old Town Rijeka

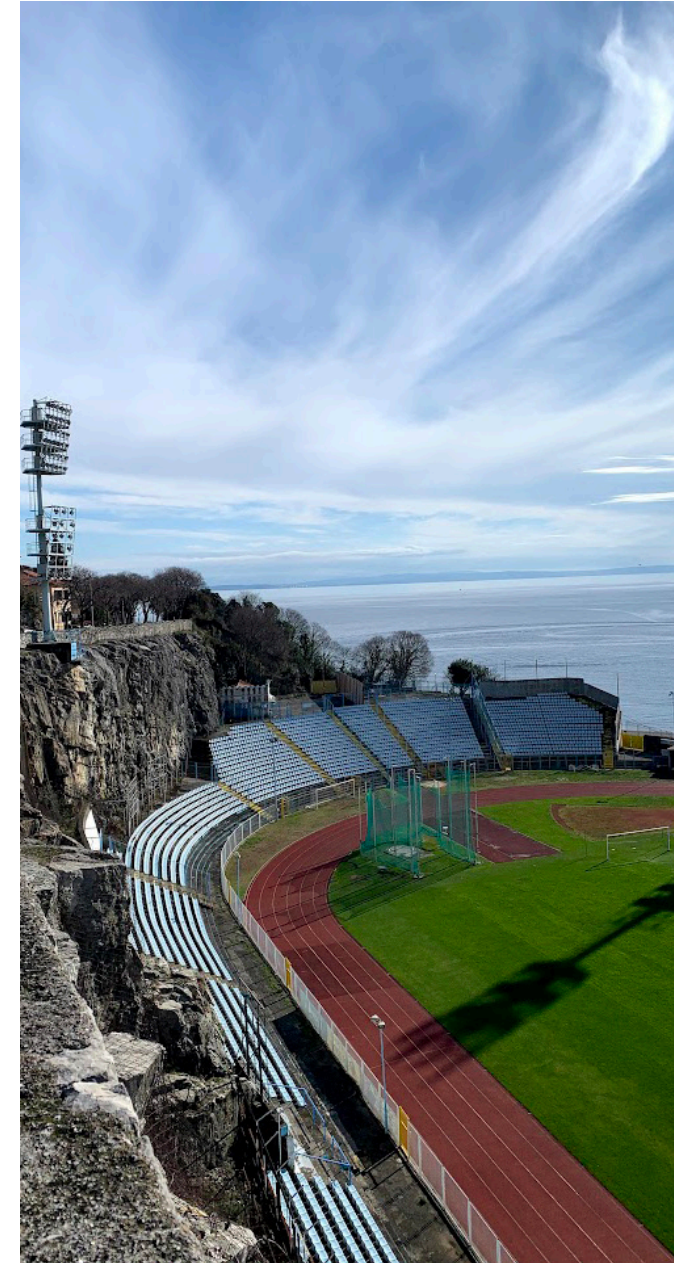
Urban layering is particularly pronounced in the central part of the city, where historic buildings coexist with commercial, government, and corporate structures. This creates a visual and architectural grid that reflects the city's evolving history and its dynamic blend of different functions and influences. (Photo: Author)



scalability

Krnjevo quarter in Rijeka

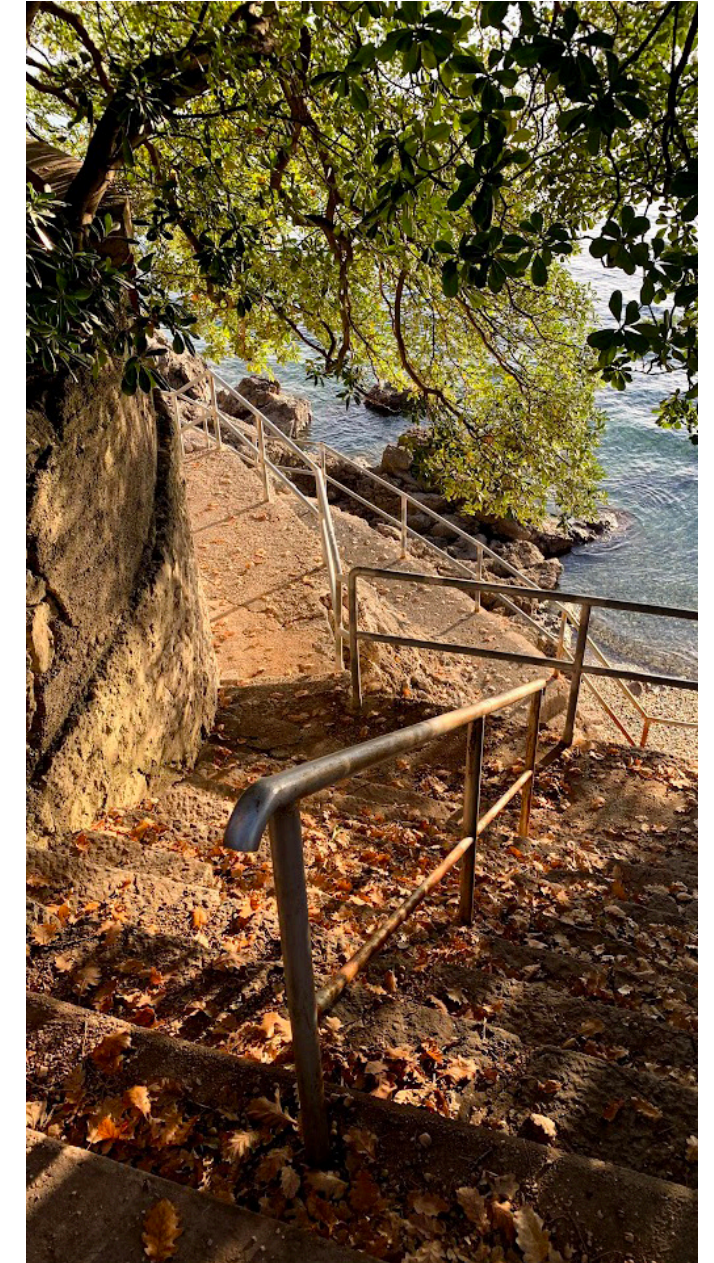
Blending and juxtaposing diverse architectural styles serve as more than just an indication of the practical requirements of urban inhabitants. It also yields multiple interpretations of urban scale depending upon the day-to-day needs of the residents. (Photo: Author)



morphology

Kantrida quarter in Rijeka

A deep-rooted sense of urban belonging is closely tied to urban morphology. Urban landscapes extend beyond mere visual spectacles encountered during city traversal. Instead, it is the daily routines, social engagements, and regular commutes that play a pivotal role in shaping this connection. (Photo: Author)



natural elements

Costabella quarter in Rijeka

The city's interface with its urban elements, primarily through promenades, marinas, beaches, and the like, is predominantly public in nature. Traditionally, the public dimension has been safeguarded by government authorities and protected by maritime property laws. Nonetheless, this status is currently facing certain challenges and vulnerabilities. (Photo: Author)

3.1.2 Current Urban Plan (10 years)

Goals of spatial development and planning according to the General Urban Plan

The development to date has solidified the city of Rijeka as a nexus of functions with national, regional/county, and local-urban significance. Specifically, it has evolved into a center for administrative, economic (including port, financial, commercial, business, etc.), transportation, infrastructure, cultural, higher education, healthcare, sports, religious, and other functions. Due to spatial constraints, it is imperative to seek internal spatial reserves, reduce further expansion, and stop uncontrolled spatial consumption (Grad Rijeka/The city of Rijeka, 2007).

The General Urban Plan outlines several general developmental objectives pertaining to the industry:

- Through development policies and measures, as well as urban planning, encourage and create conditions for accelerating the processes of **tertiary and quaternary sector** development

in line with the city's role as a macro-regional center. These processes form the foundation for establishing a new developmental threshold.

- Promote and implement **spatial redistribution** of certain functions and contents within the metropolitan area of Rijeka (referred to as the "Rijeka Ring" in the Spatial Plan of Primorje-Gorski Kotar County), especially economic activities where it is evident that continued location persistence would lead to suboptimal outcomes.
- **Persist in achieving the planned relocation of refinery operations** (Grad Rijeka/The city of Rijeka, 2007).

There is also a specific set of urban development goals that are particularly relevant to the topic of this research.

1) Goals of residential development

- a. Halt the ongoing depopulation process in the city center.
- b. Prevent the conversion of residential space into commercial or alternative uses.
- c. Plan residential development within the scope of **waterfront construction** in the Delta, Brajdica, and other areas designated for reconstruction.

2) Goals of spatial development for public and social purposes, sports, and recreation

- a. Planning for spatial redistribution of certain functions, particularly in the areas of administration, education, and culture.
- b. To plan and realize sports and recreational areas for the needs of citizens in one or more urban zones, depending on the population and spatial possibilities.
- c. To create recreational areas within the city's natural environment, including wooded areas, Rječina Canyon, valleys, and so on.

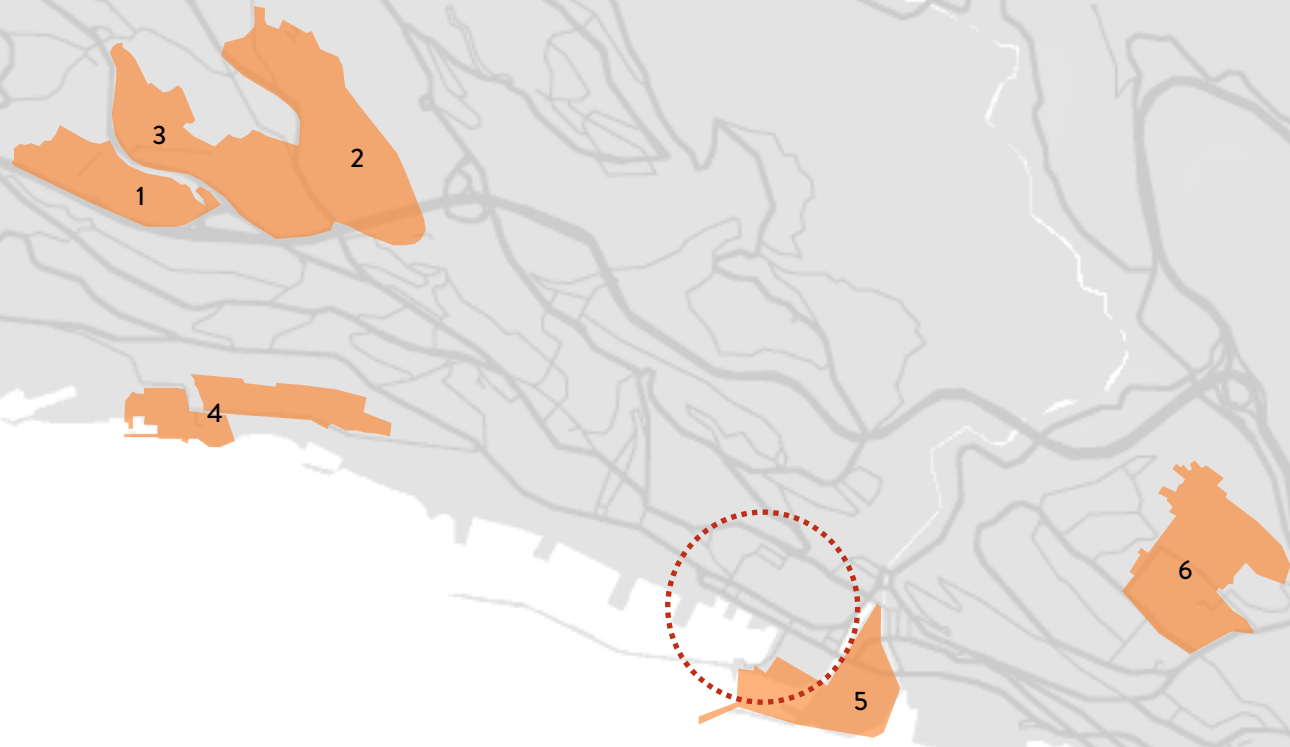
3) Economy

- a. Encourage and continue in the processes of transforming coastal economic microregions, especially within the current port area and the city center, towards their content reassignment, with the goal of reaffirming the maritime facade, coastline, and city center as valuable city resources.
- b. Create the conditions for developing the city's tourist function by formulating programs for urban tourism. Recognized as crucial urban initiatives, i.e., programs and investments of importance that will serve as the



drivers and catalysts of Rijeka's overall development, include the Delta area with the Baroš Port as part of the revitalized urban waterfront, the University campus, the Torpedo site, the secondary urban center in Rujevica along with a sports complex housing a new stadium and sports hall at the same location, and the Preluka area.

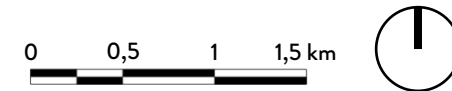
Rijeka

CITY FOCUSED PROJECTS



LEGEND

-  **City focused projects**
 1. The secondary urban center of Rujevica
 2. Residential settlement Rujevica
 3. Sports center Rujevica
 4. exTorpedo
 5. Delta
 6. University campus zone
-  Old Town Rijeka / downtown



Rijeka 2030

The Rijeka 2030 Urban Plan is a strategic document that outlines the development objectives and policies for the city of Rijeka, Croatia, until the year 2030. The plan was developed by the City of Rijeka in collaboration with the Institute of Urbanism of the Faculty of Architecture at the University of Zagreb, and it was adopted in 2017. The urban plan aims to promote sustainable development, economic growth, and social well-being in Rijeka by addressing various urban challenges, such as the ageing population, housing affordability, climate change, and mobility. It outlines several strategic objectives and policies, such as:

a) Living in Rijeka 2030: A city of diversity, where a high quality of life results from the cooperation of a smart city administration and engaged residents

- a. Education as a function of the quality of life and strengthening the economy
- b. A healthy, active and socially sensitive city attractive to live in
- c. The capital of culture even after 2020
- d. Cooperation between smart management and engaged residents

b) Working in Rijeka 2030: A university city for the new era, where advanced technologies and creative industry enrich the industrial heritage

- a. Competitive economy and the port in the age of new industries
- b. Innovative Rijeka: encouraging research and knowledge-based industries
- c. City of sustainable and innovative solutions in tourism

c) Connect Rijeka 2030: A multimodal transport hub with a sustainable and efficient transport system

- a. A city connected to the world and its surroundings
- b. Clean, efficient and affordable public transport in the city
- c. Development of the urban transport system and mobility
- d. Development of ICT infrastructure in the city

d) Save Rijeka 2030: A smart, green and clean city adapted to the needs of all citizens

- a. City of smart and high-quality communal services
- b. Green city on the sea: space at the service of citizens
- c. A city of circular resource

management, connected to the entire region (City Council of the City of Rijeka, 2021)

In addition, there is stated a horizontal goal called *Smart Rijeka 2030: regional hub for Southeast Europe for the development and implementation of smart solutions in the management of the city and city infrastructure* which will be achieved through activities and measures in all four thematic goals (City Council of the City of Rijeka, 2021).

Like any urban development plan, the Rijeka 2030 Urban Plan has faced criticism from various groups and individuals. The public authorities responsible for the Rijeka 2030 Urban Plan have demonstrated an awareness of the significant urban challenges facing the city. The development of the Rijeka 2030 Urban Plan reflects a significant effort to address the city's most pressing challenges and opportunities. The former mayor of Rijeka Vojko Obršnel, stated that there were three main challenges to address in forming the urban vision for 2030. The first challenge authorities face is demographic changes, with an ageing population, decreasing birth rates,

and a shrinking population. By 2030, the goal is to halt the negative trend and maintain or increase the current population. The second challenge is the impact of digitization and globalization. The third challenge is addressing climate change and implementing sustainable resource management. While this is a global issue, local action can contribute to positive overall results (Cupać, 2021). Despite the potential benefits of promoting industrial activity to enhance the appeal of a city, it appears that this aspect has been neglected. The economic development plan lacks definitive indications of substantial incorporation of dormant industrial heritage and zones.

3.1.3 Economic Trends

The statistics show that the stake of industry in the regional economic structure is progressively lowered since the beginning of the 21st century. The trend of de-industrialisation is present on the urban scale primarily due to the crisis in shipbuilding (City Council of the City of Rijeka, 2021). However, according to the previous analysis in the chapter *Reviewing the Socialist Heritage* and subchapter *Societies in Transition*, it is evident that the de-industrialisation trend is present due to the complex historical background and ownership and economic struggles. Furthermore, the city of Rijeka states that the current progressive economical branches are mainly linked to the trading, construction, science & education, ICT, hospitality and cultural sectors. As a beneficial result, the city primarily states the increased tourist activity and afterwards economic/entrepreneurial activity (City Council of the City of Rijeka, 2021). That statement largely corresponds to the personal observation that the city intends to improve its attraction towards the tourism sector over the

years. Moreover, the City Council of the City of Rijeka notes that some industries and related jobs will no longer be able to return because they were based on state ownership and a labour-intensive concept, and not on the capital-technological and market-based basis of development (City Council of the City of Rijeka, 2021). Seemingly, the report largely talks about past industrial activity and heritage, rather than moving forward with a future integrative industry and economy plan.

The gross domestic product (GDP) data reveals that the Primorje-Gorski Kotar County (Primorsko-goranska županija), with the city of Rijeka as its centre, is the second highest after the capital Zagreb over the last years. The GDP per capita in the territory of Primorje-Gorski Kotar County in the same year was HRK 108 million, which is more than the total GDP per capita at the level of the Republic of Croatia. Observing the trends, in the last three years the total GDP and GDP per capita have recorded growth both at the level of the Republic of Croatia and at the level of Primorje-Gorski Kotar County (City Council of the City of Rijeka, 2021).

The city of Rijeka has been experiencing positive investment trends in several sectors, including tourism, real estate, and transportation. The construction of a new port terminal, which started in 2019, is expected to boost the city's transport and logistics industry, attracting more foreign investors. The Croatian government has also implemented several incentives to promote foreign direct investment, such as tax relief and grants, making the city an attractive destination for international investors. In terms of real estate, Rijeka has seen a surge in property development

projects, including new residential and commercial buildings, as well as renovations of historic buildings and industrial zones. Additionally, the city has been investing in cultural infrastructure, such as the new Rijeka City Museum, which opened in 2020. Finally, the tourism industry in Rijeka has also been on the rise, with the city's cultural heritage, events, and seaside location attracting more visitors every year. Overall, Rijeka's investment trends suggest a positive economic outlook, with opportunities for growth and development across multiple sectors.

3.1.4 Stakeholders

Stakeholders of industrial activity affect the greater economic context of the city. There is a division between public and private ones. The analysis of the current most impactful ones allows us to understand the context on the metropolitan urban level.

When it comes to the private stakeholders, there is a list of the five largest entrepreneurs in Rijeka according to the number of employees in 2019. The listed companies generate 24.2% of the total number of employees in Rijeka companies, 31.1% of total revenue and 13.3% of total profit (HGK as cited in City Council of the City of Rijeka, 2021).

Considering the entrepreneurial structure on the urban scale, there are to mention a few main activities - manufacturing industry, construction, trade, transport and storage and professional, scientific and technical activities. In 2019, these branches were contributing to 81% of total revenues and a share of 71% of the total number of employees in the city of Rijeka. Analysis from 2010 to 2018 shows that the largest growth was recorded

in transport and storage activities, namely 56%. In the period from 2010 to 2019, the largest losses were recorded by construction activities and manufacturing. The great impact of the decline had an economic crisis and data shows that construction is picking up from 2015. Of the entrepreneurs operating in the five most significant activities of the Rijeka economy, during the period 2010 - 2019, the best results were achieved by those in Professional, scientific and technical activities (City Council of the City of Rijeka, 2021).

In the same period (2010 - 2019), the number of entrepreneurs in the Activity of providing accommodation and preparing and serving food increased by 118%, revenues by 105%, and the number of employees by 59%. Very high growth rates are also recorded in the Art, entertainment and recreation activity, within which the number of entrepreneurs has increased by 87%, the number of employees by 295%, and the increase in income amounts to 405%. Furthermore, the number of entrepreneurs in the field of information and communication increased by 30%, with an increase in income by 49% (City Council of the City of Rijeka, 2021). Based on the

provided data, it is evident that Rijeka turns towards the idea that the economy is built on the foundations of a society of knowledge and new technologies and in the direction of the destination of urban tourism (City Council of the City of Rijeka, 2021).

There is a direct correlation between the previously mentioned, growing branches and the public investment in the urban built environment. For example, the transformation of an

ex-military area into the educational campus of the University of Rijeka and a dormant ex-industrial zone into the art quarter Benčić done under the cultural program of Rijeka European Capital of Culture 2020. It seems that the transformation of the urban environment favours the development of strategic urban planning.

Some notable private investors in Rijeka include companies such as Jadroplov, one of the largest shipping

| Nr. | Company name | Activity |
|-----|----------------------------|-------------------------------------|
| 1 | Plodine | Trade |
| 2 | Jadrolinija | Nautical Transportation and Storage |
| 3 | 3.MAJ Shipyard | Manufacturing |
| 4 | The Port of Rijeka | Trade |
| 5 | Jadran-Galenski laboratory | Pharmaceutical Production |

03 Understanding the Current Urban Dimension of Novi Sad and Rijeka

companies in Croatia, Jadranka Hotels, which operates several hotels and resorts in Rijeka and surrounding areas, and the INA Group, which operates an oil refinery in Rijeka. Several local small and medium-sized enterprises contribute to the city's economic development. In recent years, the Croatian government has implemented various measures to promote foreign direct investment (FDI) in Rijeka and other parts of the country. This has led to an increase in FDI inflows, particularly in the fields of tourism, real estate, and transport infrastructure. Furthermore, in recent years, the prominent foreign investor Lürssen Werft GmbH & Co.KG has significantly altered the discourse surrounding the available urban resources. Peter Lürssen, a naval architect and CEO of Lürssen Werft GmbH & Co.KG, a company specializing in naval ships and luxury yachts. The company has initiated several projects in the Rijeka area, including the construction of a marina in Porto Baroš in collaboration with ACI. The activities of Lürssen Werft GmbH & Co.KG have attracted new experts from different regions, creating an ecosystem in the Kvarner area connected to key stakeholders in shipbuilding. The company aims to

make Rijeka internationally recognized as a leading place for innovation and the development of new technologies in the maritime industry, and Croatian companies from the Lürssen group will play a significant role in building new vessels of the future. The company aims to steer Rijeka and Kvarner to become integrated, green, and smart destinations while promoting the excellence of the workforce that will develop advanced technologies and services (Glavan, 2023).



Figure 3.1 (far left) Terminal Rijeka of the Port of Rijeka (Source: lukarijeka.hr)

Figure 3.2 (left) Jadrolinija is a prominent Croatian ferry company, connecting the mainland to various Adriatic islands and coastal destinations (Source: Author)

Figure 3.3 (above) Adriatic Gate Container Terminal of the Port of Rijeka (Source: lukarijeka.hr)

3.1.5 Challenges

Certain challenges on the national scale largely affect the considered urban scale of the city of Rijeka. Specifically, big institutional challenges negatively affect investments and productivity in the private sector, as well as the quality of consumption. The research by World Bank lists two main general institutional challenges – (a) working environment and (b) government efficiency (The World Bank, 2019).

(a) working environment

Within the European Union, The Republic of Croatia is generally ranked among the lowest considering the probability of corruption and justice together with Greece and South Italy. Corruption, nepotism and clientelism are common in the working environment. Moreover, the real estate market is not up-to-date, which makes it difficult for investors to productively convert land in cities, on the coast and in other regions (The World Bank, 2019).

(b) government efficiency

Within the European Union, the Republic of Croatia is poorly ranked when it comes to government

efficiency. It applies to the quality of regional development and the use of European Union funds which is often linked to the lack of transparency and neutrality. Therefore, from 2020 Croatian public institutions are urged to strengthen their operational processes and structures to become more resilient and overcome challenges (The World Bank, 2019).

Further considerations of the national framework state that there is a lack of human capital which applies to education. Specifically, to respond to the ever-changing global economic trends, it is necessary to introduce a not-classical approach to education. Croatia is at the bottom of the European rankings scale regarding the participation of adults in additional education and training programs. That vastly reflects the poor innovation and entrepreneurial skills within the private economic sector (The World Bank, 2019).

In addition, uneven territorial development largely affects individual cities on the national level due to the lack of economic chain integration and networking. According to the World Bank, secondary cities, namely

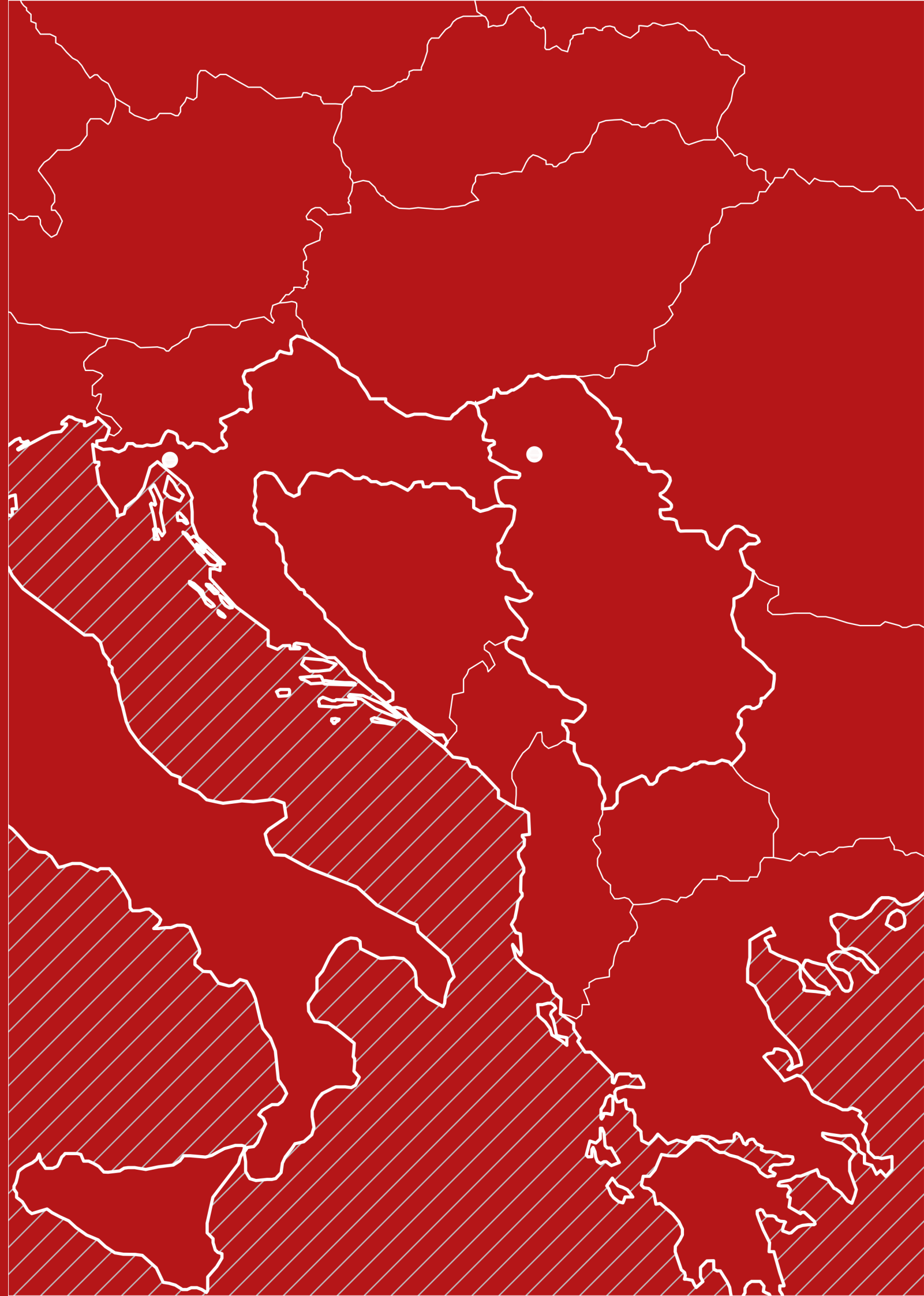
Rijeka and Pula, are characterized by significant potential for diversified economic activity but face limitations in market access. The main issue in areas with a high concentration of economic activities but low market access is to improve connectivity, which includes international connectivity via ports and borders, connectivity with other major domestic markets, and connectivity with nearby areas facing locational challenges. Improving the efficiency of the most critical trade and passenger routes to international markets is highlighted as necessary in the context of the city of Rijeka. Rail services are identified as significantly lagging behind other modes of transportation. The most critical railway routes for connecting international freight traffic are the RH1 to Belgrade, Serbia, and the RH2 to Budapest, Hungary (which accounts for 75% of Croatian railway traffic). Improving railway connectivity (with RH2) in the Port of Rijeka is crucial for the future of the Croatian railway freight market (The World Bank, 2019).

Despite the urban development on the regional scale, demographic trends remain a great challenge for the city of Rijeka. According to the 2011 census, Rijeka has 128,624 inhabitants, and according to the latest official projections for 2018, there are 8% fewer inhabitants in the City of Rijeka than in 2011. The negative population growth rate of the city of Rijeka and its county is the biggest one in the entire country. Not only that, but negative migration trends show that more people emigrated than immigrated to the city (City Council of the City of Rijeka, 2021). That surely indicates that the city lacks attractive working opportunities or a promising urban vision for its future development. It is important to note that the land devoted to residential development was 35% decreased from 2011 to 2018 which shows that there is a lack of interest in residential construction expansion.

Figure 3.4 Rail services are identified as significantly lagging behind other modes of transportation (Source: lukarijeka.hr)



Novi Sad



3.2 Current Urban Agenda and Vision for Novi Sad

3.2.1 Urban Context

According to the most recent official census from 2022 Novi Sad is Serbia's second-largest city after Belgrade. Novi Sad has a municipal population of 341.625. inhabitants, which makes it a medium-sized town. It is an industrial and financial center of Serbia's economy and one of the region's biggest construction sites (Milica Kostreš, May, 2011).

Novi Sad was founded in 1694 when the construction of the Petrovaradin fortress on the right bank of the Danube began. Along with the construction of the Fortress, the Mostobran was built

on the left bank. After the construction of the bridgehead was completed, artisans, merchants, and refugees from war-torn Serbian regions settled on the left bank. Serbs comprised most of the population, so the generally accepted name was Srpsko Selo (Serbian village) (Anon., 2001). The city was under Austro-Hungarian rule for centuries and gained its independence thanks to wealthy and educated citizens who bought the status of a free royal town from Maria Theresa in 1748. As a result, the city acquired the right to self-governance, collect taxes and fees, and freely exercise economic activities (Popov, 2012).

From 1748 through the 19th century, Novi Sad lived and grew like many other

towns in Austrian Border provinces. Since then, it has had a mixed population of Germans, Jews, Armenians, Greeks, Slovaks, Hungarians, and Serbians. During the 19th century, Novi Sad was the most significant urban settlement, and during the liberal political period of the 1860s also an important political center of the Serbians. Even though it was a lively and picturesque town with rich urban life on the Danube, the main activity was agriculture. This remains until after the First World War when it became part of its natural state entity whose part it has remained to the present. The changes were rapid, both material, spatial-cultural, and political. At the same time, it began to build up its industry.

Novi Sad entered the modern phase of its development with the end of the Second World War. In the economic sense, the town proliferated, particularly its metalworking, machine tools, textile, electrical, food processing, and oil production industries. For this reason, the town's population began to increase rapidly; furthermore, it was in ninth place in Yugoslavia by the overall value of national income. The urban image of the city, viewed as a whole, has also significantly changed. (Petrović, 1987) The city's urban transformation began in the fifties and sixties. Novi Sad was no longer a medieval city of narrow winding streets, low, crowded houses, and empty fields overgrown with reeds. It has become a city of wide boulevards and streets with lawns and

03 Understanding the Current Urban Dimension of Novi Sad and Rijeka

Figure 3.5 Two sacred buildings in Novi Sad that testify to cultural diversity (Source: Aleksandar Milutinovic)



tree-lined streets, dominated by high-rise buildings of modern lines. The number of inhabitants of the town has doubled in less than a decade, while the city's territory has increased by almost four times due to the construction of housing units. (Hornok, 2016)

Even with extensive construction works during the period of Yugoslavia, Novi Sad still retains its picturesque image. Nowadays the responsibility of the urban planners of Novi Sad has become more significant because of the need for housing and the city's expansion. The need to preserve the image of a city that has followed rapid growth for centuries should become primary. However, the city is currently grappling with its most significant crisis. The city has fallen victim to the influence of politics, private investors, and an inadequately managed urban planning institute. Unfortunately, the decisions made in the realm of urban planning over the past two decades have inflicted substantial damage upon the city once – pristine image and rich heritage. As a result, the overall quality of life in Novi Sad has been on a decline, while the population continues to overgrow.

Figure 3.6 City of wide boulevards (Source: Aleksandar Milutinovic)



3.2.2 Current Urban Plan (10 years)

The General Urban Plan (GUP) of Novi Sad until 2030 was adopted on July 21, 2022. This document determines the city's urban development strategy by defining the space's purpose, the construction area's limits, and the construction of infrastructure. The plans are further developed in other documents, such as the general regulation plan. The city's urban strategy and building rules are defined in the abundant documentation on almost 300 pages and numerous graphic attachments. (Conić, 2022)

In the document of the General Urban Plan, in the section of the vision and goals of the spatial plan, it is stated that *the idea of the development of the area covered by the General Urban Plan is based on an overview of its future role, place, and function in the Republic of Serbia, the regional and European environment, all to create such a development concept in which Novi Sad will develop as a modern European city.* (General Urban Plan of the city of Novi

Sad, 2022)

Furthermore, the main objectives of the development of Novi Sad include:

1. Ensuring positive demographic trends and creating an attractive environment for life.
 2. Preservation and improvement of the planning area's environment, material, spiritual and cultural values.
 3. Creating spatial planning conditions for faster economic growth, attracting investments, and developing highly profitable activities and entrepreneurship.
- (General Urban Plan of the city of Novi Sad, 2022)

These facts look good in theory, but they turned out differently in practice. The urban strategy ended up in zoning urban areas without a clear vision for the city's future. For this reason, the plan caused numerous debates and public outcry. (Miladinović, et al., 2022)

Fundamental problems of the plan:

1. The plan needs a development vision for the city.
2. Another problematic issue is public investments in infrastructure without clear justifications being given for it.
3. Furthermore, there is significant non-compliance with the plans of

a higher order and the regulations concerning the construction of GUP.

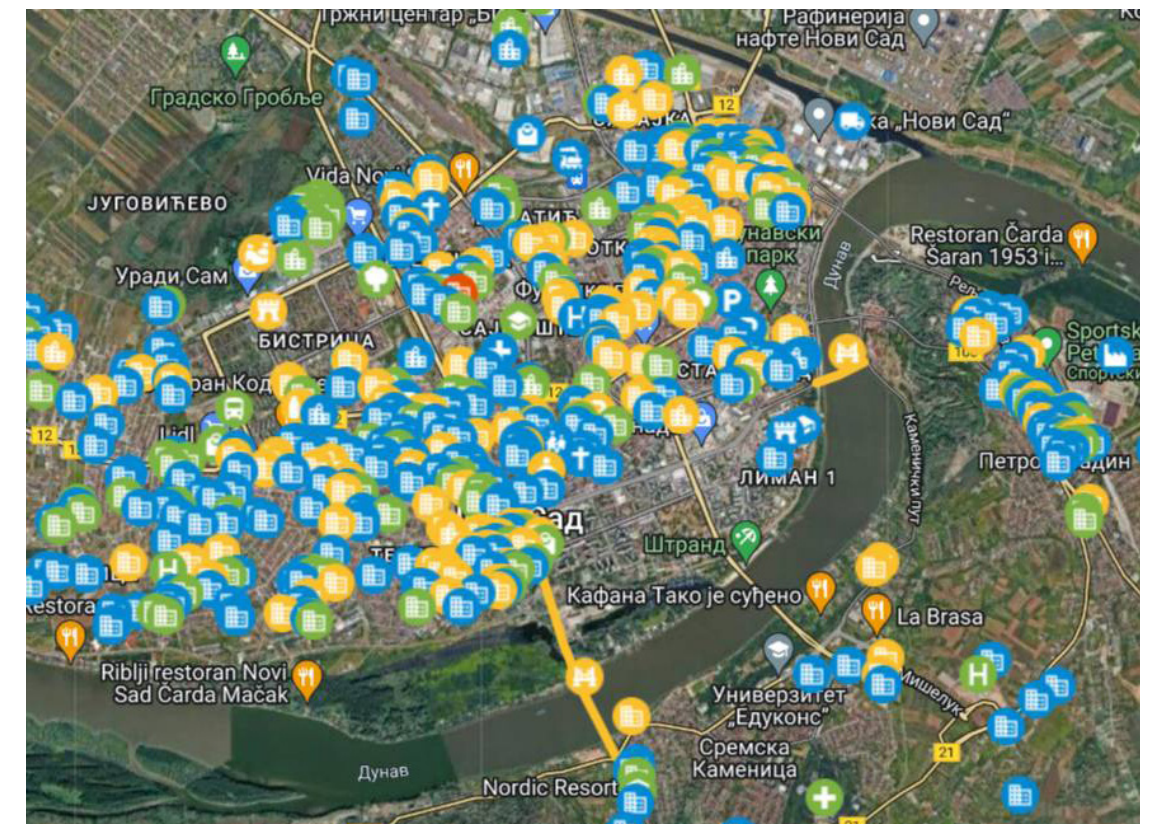
4. One of the problems is the construction conditions in the area of the general city center, which are marked in red on the plan. This purpose leaves the possibility of building buildings of different purposes, such as buildings of a business-commercial nature, hospitality, but also housing and business. Furthermore, the number of floors of buildings in this zone is not limited, and investors have complete freedom. The plan leaves the possibility of corrupt actions, where the chances of the investors will depend on the

dialogue between the investors and the city council. Unfortunately, this type of dialogue usually ended badly for the city's citizens. (Miladinović, et al., 2022.)

5. Lack of Public Participation: Some critics argue that the urban plan was developed without adequate public participation and consultation. They argue that the plan reflects the interests of a small group of decision-makers and developers, rather than the needs and desires of the broader community.

Urban planning is reduced to the technical translation of placed capital into space,

Figure 3.7 Map of construction sites in Novi Sad for 2022. with 269 active construction sites, mostly residential. (Source: Gradnja.rs)



thus becoming a key tool for legalizing extra profits. (Slobodan Jović, Dragana Konstantinović, Igor Peško, 2022)

The most controversial part of the project that drew the public's attention was constructing a residential and business complex on the shipyard next to the Danube. The plan states that the shipyard is no longer in operation, and there is a need to review the purpose of that land. This concept is popularly called the Waterfront, and it represents a new trend in the world. Furthermore, another housing and business project is planned at the foot of the Petrovaradin fortress. (Conić, 2022)

Urban changes in the last several decades in Novi Sad were introduced despite the disapproval of experts and the citizens. Demolitions of buildings were conducted according to the level of attractiveness of the site and the level of interest of the investors with the consent of the authorities. After several unsuccessful attempts to preserve the sustainable identity of Novi Sad, the citizens finally succeeded in preserving the sport and business center SPENS, although the authorities had the intention to tear it down. (Milka Bubalo Živkovic, Tamara Lukić, Bojan Derčan,

2021.)

Based on the principle of high density and zoning areas, this strategy will cause low energy efficiency and low architectural design quality of new buildings, lack of green spaces, public facilities, and infrastructural corridors. This strongly influences the capability of Novi Sad's urban area to become more sustainable. Poor environmental performance of new constructions is already present. Therefore, there is a necessity to produce new approaches to development. Through a strategic urban planning approach, a city's development could focus on reducing negative impacts on urban growth while engaging in more sustainable land use planning.



Figure 3.8 (above)
SPENS - Sports
and Business Center
Vojvodina opened in
1981.
(Source: Nevena
Popović)



Figure 3.9 (left)
SPENS - Sports
and Business Center
Vojvodina, interior
(Source: Nevena
Popović)

3.2.3 Economic Trends

Novi Sad is the economic center of Vojvodina, the most fertile agricultural region in Serbia. In addition, the city is one of Serbia's most significant financial and cultural centers.

During the 1990s, the city (like the rest of Serbia) was severely affected by economic sanctions and the hyperinflation of the Yugoslav dinar. The embargo and bad business led to the collapse or closure of once large industrial enterprises, such as "Novkabel" (electric cable industry), "Pobeda" (metal industry), "Jugolat" (tools), "Albus" and "HINS" (chemical industry). The Novi Sad oil refinery, located northeast of the city (together with the thermal power plant-heating plant) near the Shanghai settlement, practically remained the only large enterprise.

The economy of Novi Sad mostly recovered from that period and overgrew after 2001, after the economy transitioned to the tertiary sector. Privatizing state and social property, as well as a robust private

initiative, have increased the share of private companies to 95% in Juznbacka District, and small and medium-sized companies dominate the city's development. (Južnobački privredni okrug, Republika Srbija, 2023) Through the privatization process, the state budget has been filled for years. However, Serbia is confronting an economic crisis with few state-owned companies. This means there are no conditions for another round of privatization, and the question of transferring agricultural land to building sites appears as a question. Moreover, this approach is unsustainable for the economy of the Autonomous Province of Vojvodina since it is traditionally known as an agricultural region. (Milica Kostreš, May, 2011)

The last document, the Economic Development Strategy of Novi Sad, accepted at the city meeting dates from 2009. (Novi Sad, 2009) A new economic strategy plan is being developed and needs to be more transparent. There also needs to be transparent data on gross income.

However, since Novi Sad has the most significant number of construction sites in the territory of Serbia, there

are numerous analyzes related to the current expansion of residential buildings.

The increase in the construction of residential buildings in Novi Sad can be attributed to several factors. One of the main factors is the growing demand for housing due to population growth, urbanization, and a rise in the standard of living. Furthermore, there is the availability of financing options and the low-interest rates. Banks and financial institutions in Serbia are providing more favorable loan terms, which has made it easier for individuals and developers to finance construction projects. In addition, the Serbian government has implemented policies and programs to support the construction industry, such as tax incentives, subsidies, and simplified procedures for obtaining permits and licenses.

Another significant trend that occurred in past years is the emergence of a thriving startup ecosystem. Novi Sad has become a hub for innovative entrepreneurs and technology-driven ventures. This trend is also encouraged by a highly developed university. The University of Novi Sad, especially the Faculty of Technical Sciences, from

which more than 160 start-up and spin-off companies originated, contributed the most to the expansion of the IT sector in the last few years, which resulted in Novi Sad being considered the IT center of Serbia.

Another notable trend is the expansion of the manufacturing industry. Novi Sad has seen increased investment in manufacturing facilities, particularly in the automotive, machinery, and electronics sectors. Finally, tourism has also been a significant contributor to Novi Sad's economy. The city's rich cultural heritage, vibrant festivals, and picturesque landscapes have attracted a growing number of domestic and international tourists. (Novi Sad, 2009)



Figure 3.10 (left)
Works on the
construction of a
parking lot in the
city center (Source:
gradnja.rs)



Figure 3.11 (right)
Construction of a
new residential block
(Source: gradnja.rs)

3.2.4 Stakeholders

The leading role in creating the environment and foundation of the development city has private capital, municipal administration, and the construction sector. These three stakeholders operate in a closed interconnected system of mutual interests.

The city of Novi Sad has a regional certificate, “A city with a favorable business environment in Southeast Europe,” according to the BFC SE standard, which guarantees the quality of services that the city provides to investors and businessmen. In addition to the City of Novi Sad, the Province, and the Republic, institutional support for business development at the local level is provided by numerous professional associations and clusters, the Educational Center, the National Employment Service, the Novi Sad Fair, the Business Incubator Novi Sad - intended for beginners in the field of IT, and additional incentives are expected and from the newly built Science and Technology Park, whose goal is to facilitate the transfer of technologies and knowledge from the academic and research and development environment

to the business sector. (Kancelarija za lokalni ekonomski razvoj, 2022)

The city administration plays a dominant role in the city’s development, which offers specific benefits for private companies and their investments. For example, the city of Novi Sad owns attractive greenfield sites for various purposes (business, production, and multi-family housing). Furthermore, the free customs zone of Novi Sad offers accessible business and the import and export of goods and services without quantitative restrictions and payment of VAT and customs duties. (Kancelarija za lokalni ekonomski razvoj, 2022)

3.2.5 Challenges

The analysis brings to light the critical need to reevaluate current urban practices as a means to halt the ongoing degradation of the city’s quality of life. It emphasizes that there is no direct correlation between economic growth and planning strategies. While industrialization and urbanization are integral components of development, the driving force behind urban development in Novi Sad is predominantly property-led rather than being centered around industrial surplus-driven growth.

Despite the city’s considerable development potential, limited diversification within the economy exists. Novi Sad heavily relies on a few industries such as automotive manufacturing, IT, and agriculture, which renders the city susceptible to economic fluctuations in the global market. This overreliance on specific sectors poses a risk to the overall stability and resilience of the local economy.

It is worth mentioning that bureaucracy and corruption can block the progress of businesses and slow down economic growth as a whole. Delays in obtaining permits and licenses,

and higher costs associated with these bureaucratic processes create obstacles for businesses operating in Novi Sad. Addressing these issues is crucial to foster a more favorable business environment that encourages entrepreneurship, investment, and economic development. One of the primary challenges ahead involves redefining the urban planning approach. This necessitates revitalizing the dialogue between authorities and citizens, building a stronger partnership to improve residents’ lives. Overcoming this challenge requires the collaboration of multiple institutions, working together towards a common goal of enhancing the well-being and prosperity of the community.

By rethinking urban practices, diversifying the economy, combating bureaucracy and corruption, and fostering effective collaboration between authorities and citizens, Novi Sad can better position itself for sustainable and inclusive development. This holistic approach has the potential to create a more resilient and prosperous city, capable of adapting to economic changes, nurturing innovation, and improving the overall quality of life for its residents.

3.3 Demand for Strategic Urban Planning Approach

Previous chapters portray the complex ownership struggles, ideological and societal transformations and heritage issues in the region of interest for this paper. Considering the fact that certain urban zones are neglected, there is a vital need to integrate Strategic Urban Planning Approach. This specific approach has been proven to effectively deal with more complex European metropolitan regions regarding their future development and consolidation of urban vision.

In order to define Strategic urban planning and its importance, we referred to the following definition: strategic spatial planning is the process through which a variety of public and private actors with a stake in the region, such as public-sector planners, politicians, private landholders, and an organization representing community and environmental issues, come together in diverse institutional settings to prepare strategic plans by developing interrelated strategies for the management of spatial change. (Anna M. Herspergera, 2019)

Strategic spatial planning comprises two phases which overlap, plan – making and plan implementation. The main output is usually a plan that

stimulates an overall development strategy for the urban regions and strategic urban projects. Furthermore, the development strategy might refer to the densification of residential areas, the development of employment districts, or the delineation of zones for environmental protection, preservation of cultural heritage, etc. (Anna M. Herspergera, 2019). This deliberated introduction of the Strategic project is essential for our study since we are dealing with regions lacking strategic planning since the socialistic period. Moreover, providing new initiatives to redevelop dormant industrial zones in our cities of interest would allow an understanding of the principles for the city's further development and influence the urban agenda.

There are plenty of examples of strategic urban projects greatly varied in size and their aim. Redevelopment of railway stations (Stuttgart, Milan, Vienna), the construction of crucial transportation infrastructure (Barcelona, Copenhagen), and the strength of economic poles such as Central Business Districts (Anna M. Herspergera, 2019). All these plans are strongly influenced by leadership and negotiation. The complexity of the

founding mechanism can be explained through the case of Copenhagen Ørstad. Particularly in this case, the critical role is played by the national government in financially supporting the implementation of this new district. To turn the tide in Copenhagen, which was at the edge of bankruptcy by the end of 1980, the Danish State and the city of Copenhagen cooperated and formed a publicly owned agency (By & Havn, City & Port) to act as a promoter for the new development that would occur in Ørstad. However, as private investment did not appear within the expected time, the Danish State acted as a developer: a university building and state-owned radio and TV studios were located in the upper part of Ørstad. The first private investors in the area were large Norwegian stakeholders owning a chain of shopping malls. The government made an exception and gave the shopping mall owner a larger surface than is legally allowed in Denmark (Anna M. Herspergera, 2019). This specific case indicates that urban planning goes beyond the principles or municipal intentions for the residents, but also highly depends on the economic possibilities, private stakeholders' interests and political power. This is specifically interesting

and relevant in the context of the selected cities.

To deepen the understanding of the contemporary urban reality of Novi Sad and Rijeka, it is necessary to investigate beyond the current urban agenda. The following chapters portray the contemporary urban image through analysis of Economic Trends, Stakeholders, Challenges and conclude with a SWOT Analysis.

Rijeka



3.4 Redefining Industry as a Tool for Impacting Strategic Urban Planning Approach

3.4.1 State of Industry in Rijeka

The principal industrial endeavours in Rijeka are intrinsically linked to its maritime environment, encompassing the sea and the delta of the Rječina River. Consequently, maritime and manufacturing sectors have organically co-evolved within the urban topography. The maritime industrial sector extends along the city's coastline, resulting in the spatial separation of the urban core from direct access to the sea. This intertwining of industrial and urban development is particularly evident in the utilization of the seafront by the Port of Rijeka.

Conversely, the historically fertile ground for manufacturing and productional activities has been the canyon of the Rječina River. The advancement of this zone was further catalyzed by a significant infrastructural investment of the era - the Lujzijana Road, also known as Lujzijana and Via Ludovicea. Serving as the shortest

link between Rijeka and Karlovac, this road occupied a pivotal position within the Austro-Hungarian Empire's transportation network. It adeptly accommodated the burgeoning demands of trade, the expanding manufacturing sector, and the rapidly growing industrial endeavours, thereby contributing substantively to the development of settlements along its route. Its construction, spanning a considerable length of 141 kilometres, transpired over the course of several years from 1803 to 1811. Subsequent to Rijeka's assimilation into Italy in 1924, a diminishment in traffic along the Lujzijana Road became clear. The elevated maintenance costs incurred gradually resulted in the road's progressive deterioration over time.

Collectively, the historical industrial activities and zones within Rijeka have exhibited a steady and progressive alignment with the city's contemporary urban fabric. Nevertheless, the prevailing state of these areas, despite their central location, is generally characterized by a state of disrepair



Figure 3.12 (left) Opatija/Rijeka 1939; Filippini vice president F.A.S.I. and constructor Biondo Maserati Opatija Circuit (Source: Archivio Storico Luce)

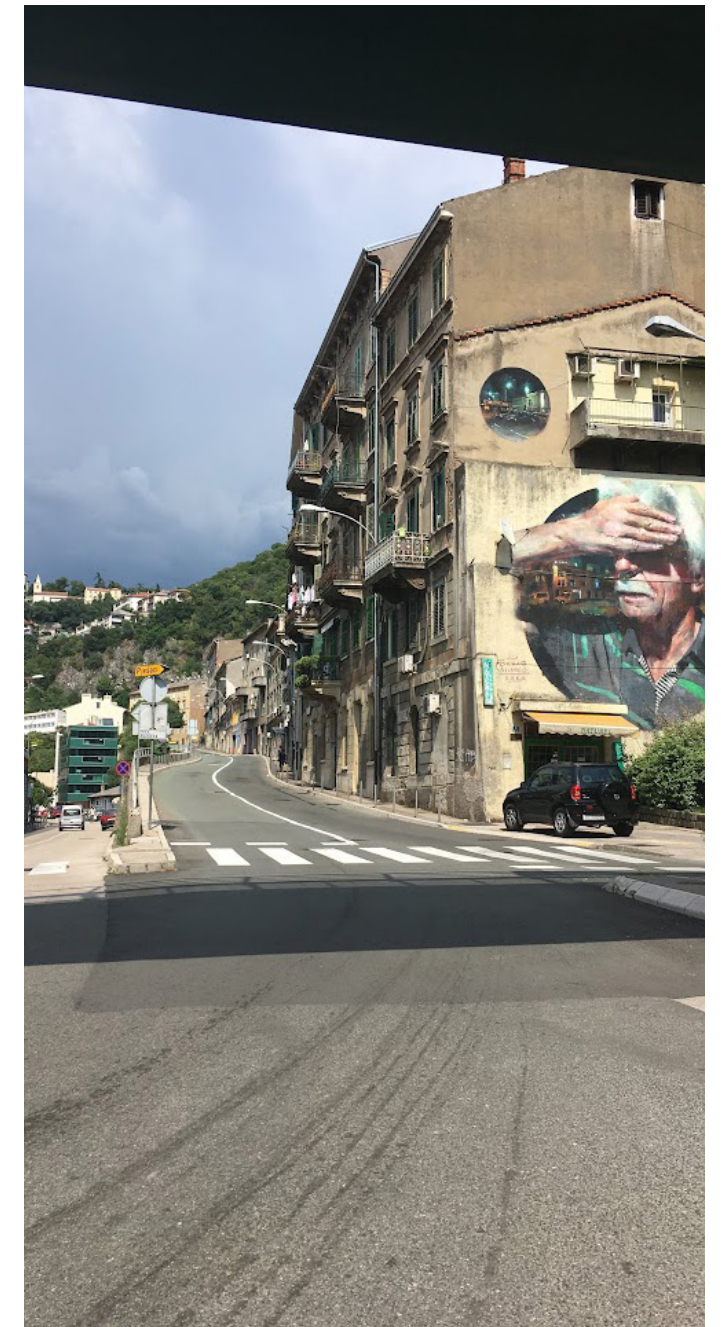


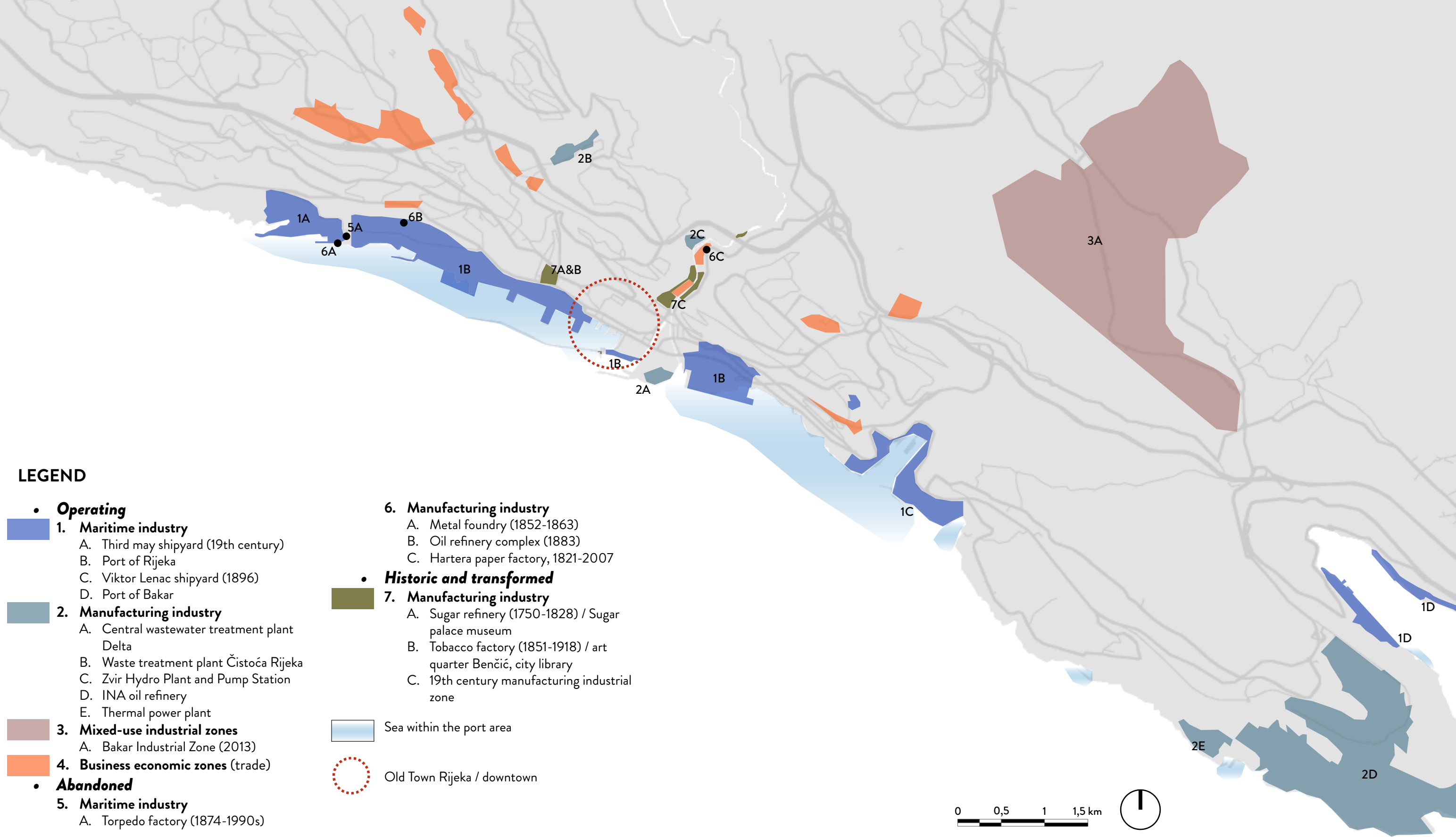
Figure 3.13 (right) Lujzijana Road today (Source: Author)

and decline. These areas take up large portions of the city, making it difficult to expand and make the most of the natural assets within the city. The most problematic areas are the ones marked in dark blue on the left side of the Rječina River, controlled by the Port of Rijeka, and the old manufacturing zone from the 19th century along the riverbank, shown in green. These areas not only make it hard for the city to improve its production and economy but also affect how people see the value

and potential of these urban spaces. Basically, without government support and investment, these areas are getting worse physically and it's hard to reuse or preserve them.

Rijeka

CITY AND THE INDUSTRY



LEGEND

- **Operating**

- 1. **Maritime industry**
 - A. Third may shipyard (19th century)
 - B. Port of Rijeka
 - C. Viktor Lenac shipyard (1896)
 - D. Port of Bakar

- 2. **Manufacturing industry**
 - A. Central wastewater treatment plant Delta
 - B. Waste treatment plant Čistoća Rijeka
 - C. Zvir Hydro Plant and Pump Station
 - D. INA oil refinery
 - E. Thermal power plant

- 3. **Mixed-use industrial zones**
 - A. Bakar Industrial Zone (2013)

- 4. **Business economic zones (trade)**

- **Abandoned**

- 5. **Maritime industry**
 - A. Torpedo factory (1874-1990s)

- 6. **Manufacturing industry**
 - A. Metal foundry (1852-1863)
 - B. Oil refinery complex (1883)
 - C. Hartera paper factory, 1821-2007

- **Historic and transformed**
- 7. **Manufacturing industry**
 - A. Sugar refinery (1750-1828) / Sugar palace museum
 - B. Tobacco factory (1851-1918) / art quarter Benčić, city library
 - C. 19th century manufacturing industrial zone

Sea within the port area

Old Town Rijeka / downtown



However, de-industrialization is an observable and prevalent phenomenon in many European urban centres, primarily driven by the expansion of the tertiary sector. In response to this trend, there exists an opportune landscape for the reintegration of industrial production activities within urban areas (Mista Team, 2022). In the light of the inactive industrial zones

in Rijeka, there's a call for a thorough reassessment of how significant industrial programs and operations are distributed within the city's structure. Perhaps, certain aspects of production that require a lot of space and many workers could be moved strategically to the outskirts of the urban area. This could help in concentrating activities more centrally.

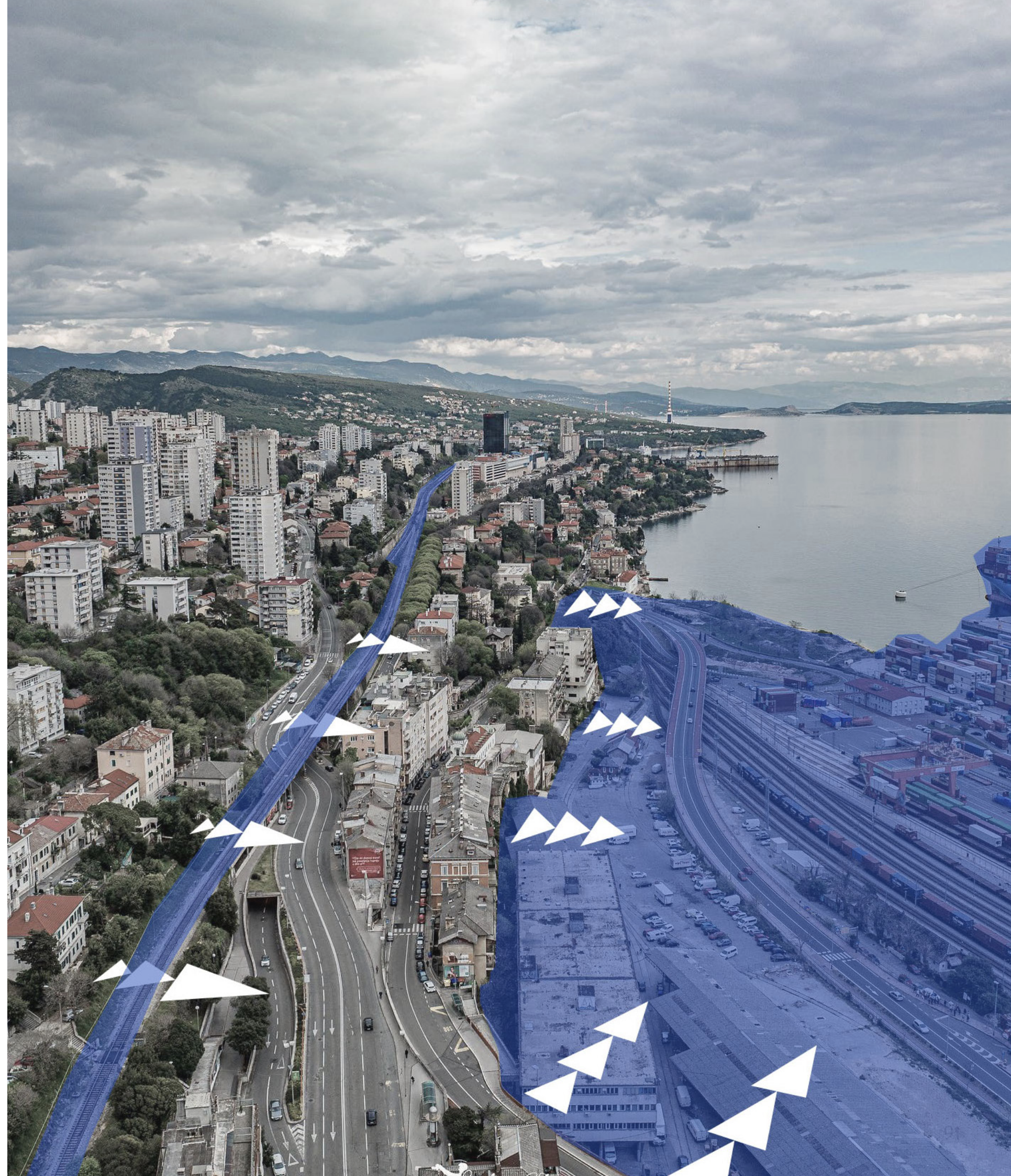
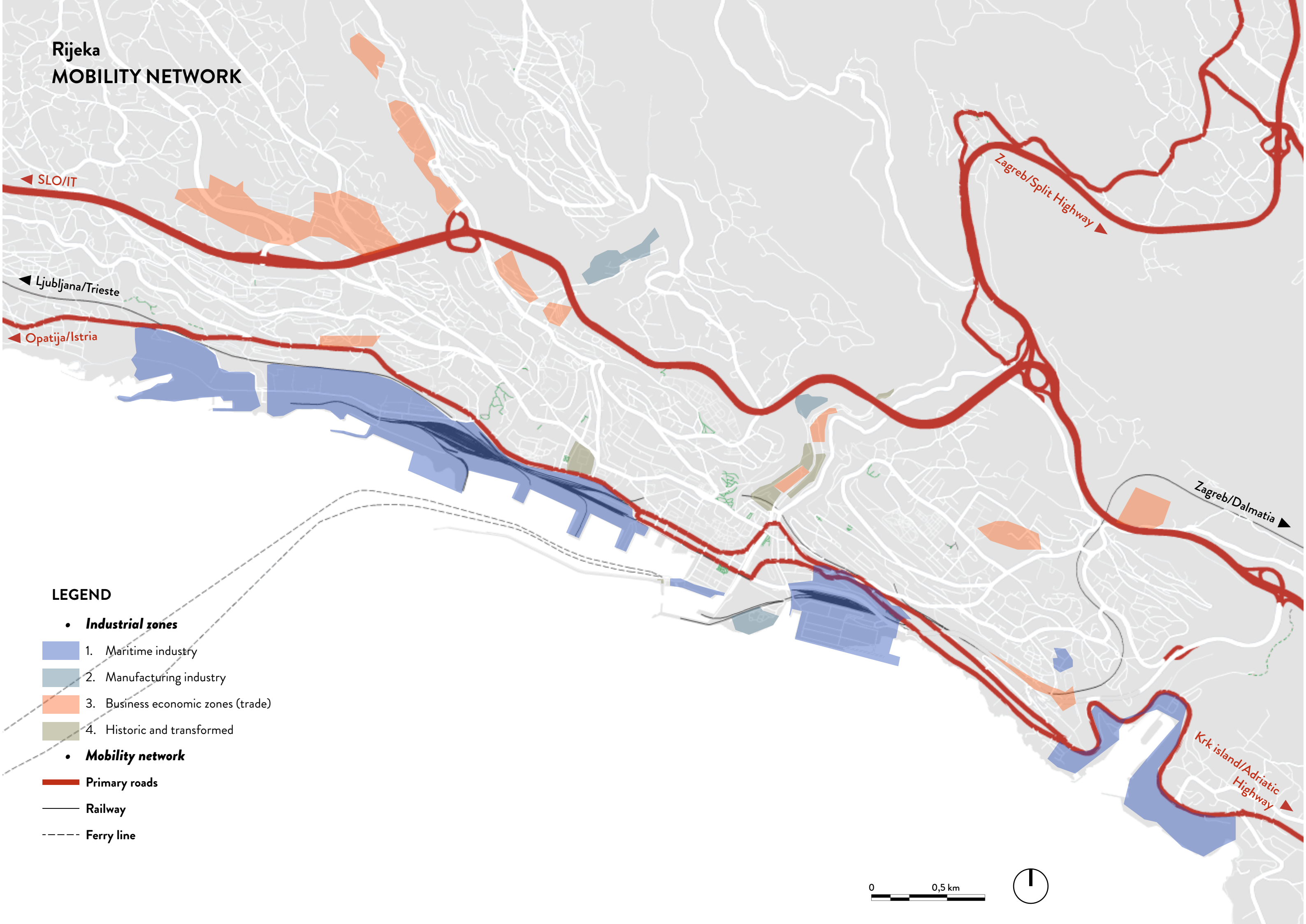


Figure 3.14 The Brojdica Container Port, railway, and industrial facilities serve as defining elements of the urban boundary (Source: Zoran Bakić Photography)

Rijeka MOBILITY NETWORK



LEGEND

• Industrial zones

- 1. Maritime industry
- 2. Manufacturing industry
- 3. Business economic zones (trade)
- 4. Historic and transformed

• Mobility network

- Primary roads
- Railway
- Ferry line

0 0,5 km



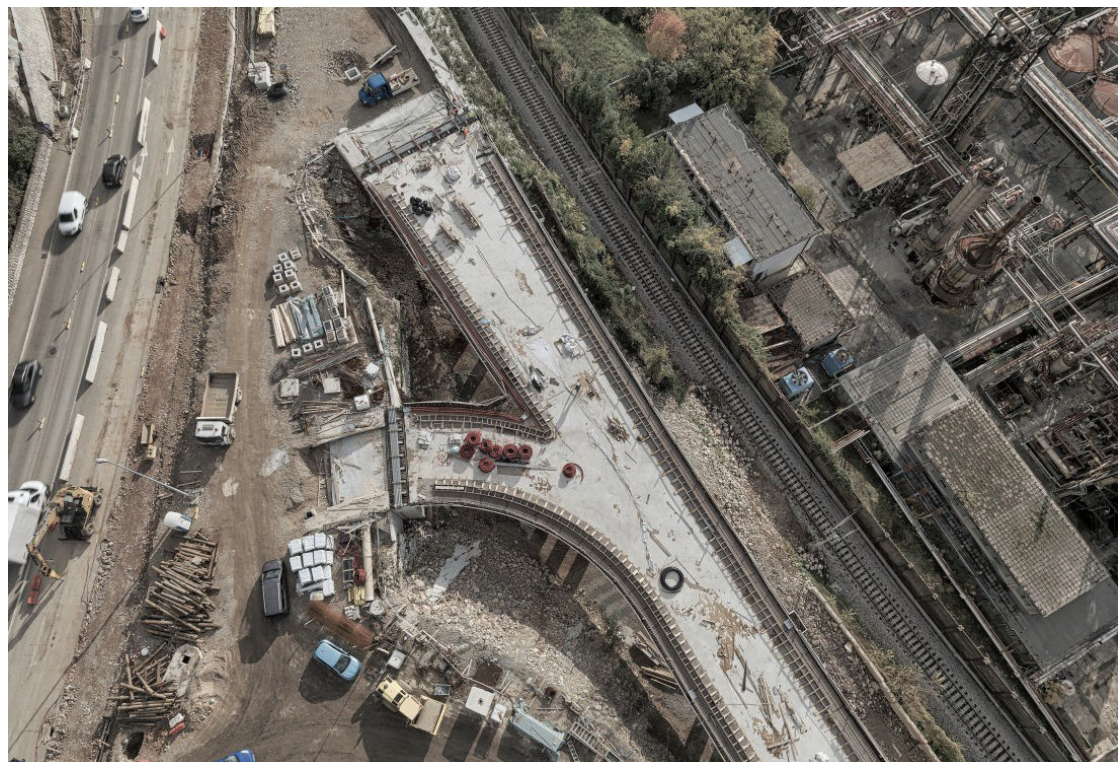


Figure 3.15 (left) The Rijeka Bypass primary road is a project that has been subject to continuous expansion up to the present day, necessitating substantial investments. The newly opened D 403 road (in the picture), connecting the container terminal on the Zagreb coast with the western part of the city center of Rijeka, represents one of the most expensive road projects in Croatia (Source: povezanahrvatska.eu)

However, the shift in industrial growth is clearly seen in the ongoing changes of the city's layout. Additionally, significant investments in infrastructure were crucial to support comprehensive economic progress and impact its level of success. The Mobility Network map illustrates the intrinsic connection between the transportation routes and the predominant industrial zones, each characterized by distinct features.

The expansion of the tertiary sector is manifest in the growth of business economic zones, primarily pertaining to trade, situated at the periphery of the central city. These zones adjoin the primary high-speed road, prominently elevated above sea level. This change happened at the start of the 21st

century and is mainly controlled by well-known global brand chains focused on mass production. Unfortunately, this dominance hinders the chance for a varied local production in the regional economy. Another negative consequence of these business economic zones at the urban scale is their gradual transformation into quasi-public spaces and the perceived focal point of the sprawling residential neighbourhoods. The absence of comprehensive planning for public spaces within these residential areas further perpetuates the notion that commercial zones are better suited for public social interactions among residents.

In addition to the growth of business economic zones, the establishment of

Figure 3.16 (right) Despite the recent renovation of the railway station, the state of rail mobility remains poor. A headline from the popular media portal RiPortal in 2022 addresses the state of railway connectivity between the two urban centers, Rijeka and Split (Source: riportal.net.hr)



the mixed-use Bakar Industrial Zone in 2013 assumes notable significance within the urban-industrial framework of the city. Situated in the hinterlands of Bakar, a historically influential port that maintains its importance to this day, this expansive mixed-use industrial zone ranks as one of the largest on a national scale, encompassing an area of 500 hectares. Research findings underscore the Bakar Industrial Zone as a prominent and concrete manifestation of urban planners' endeavours to relocate industry to the urban periphery within a concentrated industrial region. Its advantageous proximity to both the Port of Rijeka and Bakar fosters economic interplay and shared manufacturing endeavours. Furthermore, the zone enjoys direct

access to major transportation axes, including the Rijeka-Zagreb and Rijeka-Split highways, as well as connections leading to Italy and Slovenia. Additionally, the zone is linked to the preexisting railway system, featuring its own dedicated track and a transfer station spanning 5 kilometres (Industijska zona Bakar, 2020).

To attain a comprehensive understanding of the most precise assessment of the industrial condition in Rijeka, the chapter concludes by introducing the SWOT analysis methodology.

SWOT

Strengths (S)

- The strategically advantageous location of the city and its industrial zones in relation to Central European destinations and the penetration of the Adriatic Sea into the European continent.
- A long and recognizable urban and industrial tradition.
- An extensive history of the port and maritime industry.
- The Primorje-Gorski Kotar County as the second-highest earner at the national level.

- As a university city, Rijeka offers a multitude of young professionals across various fields who could contribute to shaping the future industries.
- Significant state investments in road transportation and road connectivity.
- Versatile and small-scale production activities occurring in the city's hinterland, often within residential areas (e.g., construction production on the ground floor of family homes).
- Existing and numerous public initiatives and associations highlighting the value of industrial and urban heritage (e.g., MO Hartera, Urbani Separe, etc.).

Weaknesses (W)

- The conventional production chain lacks the ability to remain competitive at the European and global levels.
- Obsolescence of existing technology, particularly within the maritime industry.
- Aging infrastructure and a shortage of resources for its renovation.
- Central urban industrial zones are secluded from public access and disconnected from the urban fabric.
- A notable dearth of adult participation in supplementary

- education and training initiatives, reflecting a significant deficiency in innovative and entrepreneurial skills within the private economic sector.
- The sluggishness, obsolescence, and unpopularity of rail transportation.
- Ownership issues stemming from state-owned company giants in socialist times hinder the fragmentation of decaying industrial zones, causing inertia in redevelopment processes and potential buying and selling procedures.

assessment of the industrial condition in Rijeka

Opportunities (O)

- Fragmenting the extensive and strategically significant industrial zone of the Port of Rijeka, which longitudinally stretches along the urban waterfront, with the aim of gradual revitalization and repurposing.
- Engaging citizens in public discussions, surveys, and media outlets.
- The growth of the IT sector and IT industry, as well as the tertiary sector.
- Capitalizing on existing urban vacancies to relocate major industrial programs away from the city center

- and establish an industrial network separate from the resident operational one.
- The city's mid-size status and its industrial heritage provide a stronger foundation for success in many processes aimed at preserving, revitalizing, and transforming existing neglected industrial zones.

Threats (T)

- The negative natural population growth observed in the city of Rijeka portrays the city as unattractive for labor force immigration.
- Unregulated foreign capital and concessionaires potentially leading to monopolies over neglected industrial heritage.
- Uncritical management of the strategically central industrial zone of the Port of Rijeka (e.g., foreign investments by the Lurssen company securing permission to construct a

- nautical port within an industrial zone).
- Bureaucratic inefficiencies in city administration and the need for substantial foreign investments to comprehensively regenerate the area.
- The unfounded and haphazard redirection of the urban agenda toward tourism, shaping the city's image primarily as a tourist destination, especially catering to elite tourism. This trend risks fostering the segregation of the local population and exacerbating class disparities, thereby diminishing residents' access to and utilization of the city.

3.4.2 The Maritime Industry Potential with an Emphasis on the Port of Rijeka

Despite being overlooked, it is important to recognize that the entirety of the Port of Rijeka is not only relevant when considering the city's metropolitan status but also holds a prominent position on the national stage within the Republic of Croatia. Its longstanding tradition and historical importance are deeply tied with the city's overall urban development. This historical and infrastructural legacy has shaped Rijeka's identity and continues to influence its trajectory. The Kvarner Bay, alongside the Trieste Bay, has historically served as the primary gateway to the sea for Eastern Alpine and Pannonian regions. It has long been recognized as a central hub for trade. The ancient Rijeka port initially emerged at the mouth of the Rječina River, and during the period of Hungarian rule from 1867 to 1914, it evolved into the contemporary port. Life by the port, although historically changing, remains

the driving force of urban activities in the city of Rijeka. The renewal and revitalization of the urban structure are based on a comprehensive resolution of the transportation system, creating conditions, providing jobs, raising residential standards, redefining the cultural, social, and recreational role of Rijeka as the county centre. *The concept starts from the Genius loci: the city's orientation towards the sea, providing numerous visual orientations towards the bay, raising viewpoints either on natural elevations or constructed objects* (Grad Rijeka/The city of Rijeka, 2007).

Long-term usage has shown that all prerequisites for building the port were well-assessed, except for the challenges posed by the clash between the port-industrial and urban complexes, two largely incompatible systems in this limited space. After the port's wartime destruction in World War II, reconstruction began with the primary goal of rapidly restoring its maritime operations. As a result, the shorelines were rebuilt to their previous lengths and depths. With a few exceptions of later reconstructions, the port's appearance has remained largely unchanged for over half a century. Over time, ship sizes have significantly

Figure 3.17 (right)
An aerial perspective of the city's northeastern sector, illustrating the aerial distance (ASL) and spatial relationships between residential (marked in white) and industrial areas (marked in blue), in conjunction with natural and morphological boundaries (Source: Z. Bakić & Author)





Figure 3.18 The longitudinal developmental urban axis has been largely utilized (Source: Google Earth)

0 0,5 1,5 km

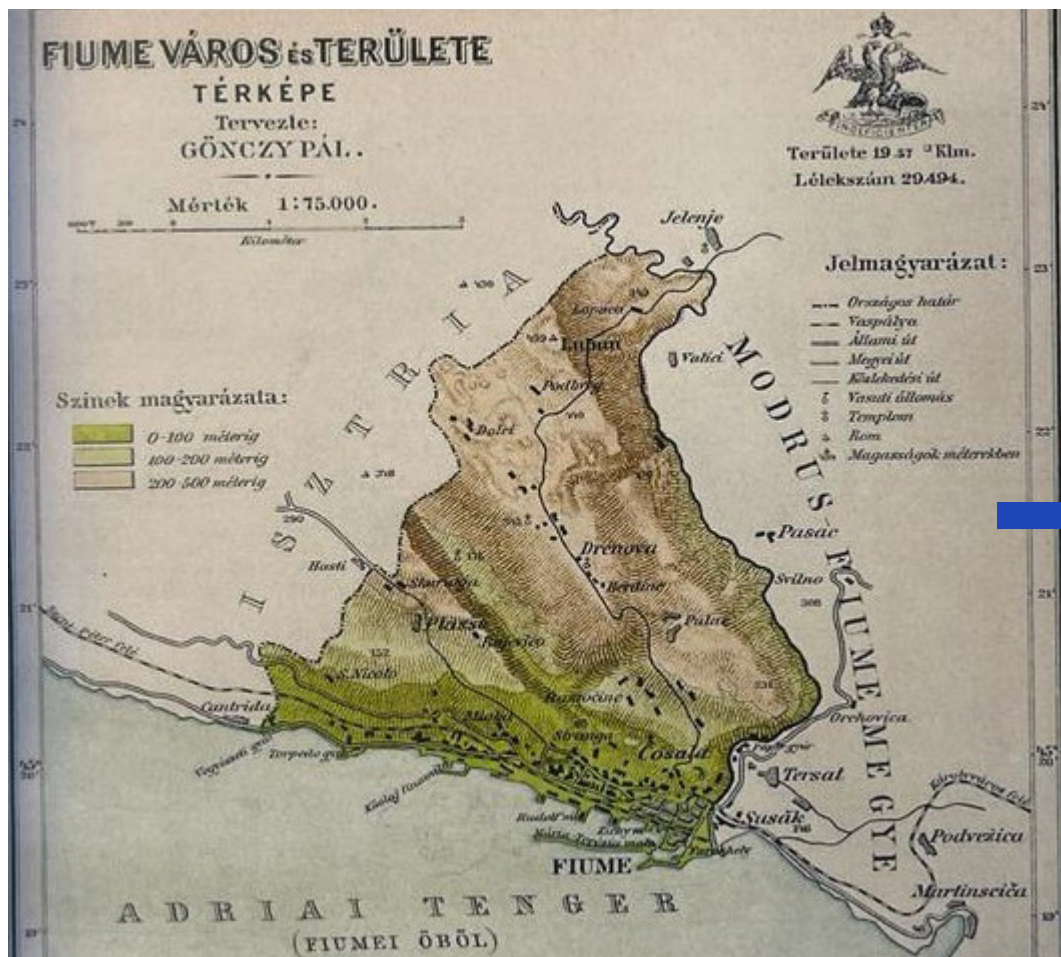


increased, creating a disparity between the port's requirements and its technological capabilities. Presently, about 60% of the berths in the Rijeka port basin need to be deepened. Over the past fifteen years, extensive efforts have been made to modernize the port and align it with the evolving demands of freight transportation. This involved updating the infrastructure, roadways, facilities, and equipment to meet

contemporary needs. While these modernization efforts have yielded positive results, the existing port basin faces challenges in accommodating new technical elements for berths, shores, roads, warehouses, and other facilities. Additionally, providing the necessary extensive port areas for cargo reception and handling is a complex task. The longitudinal developmental axis has been largely utilized. The

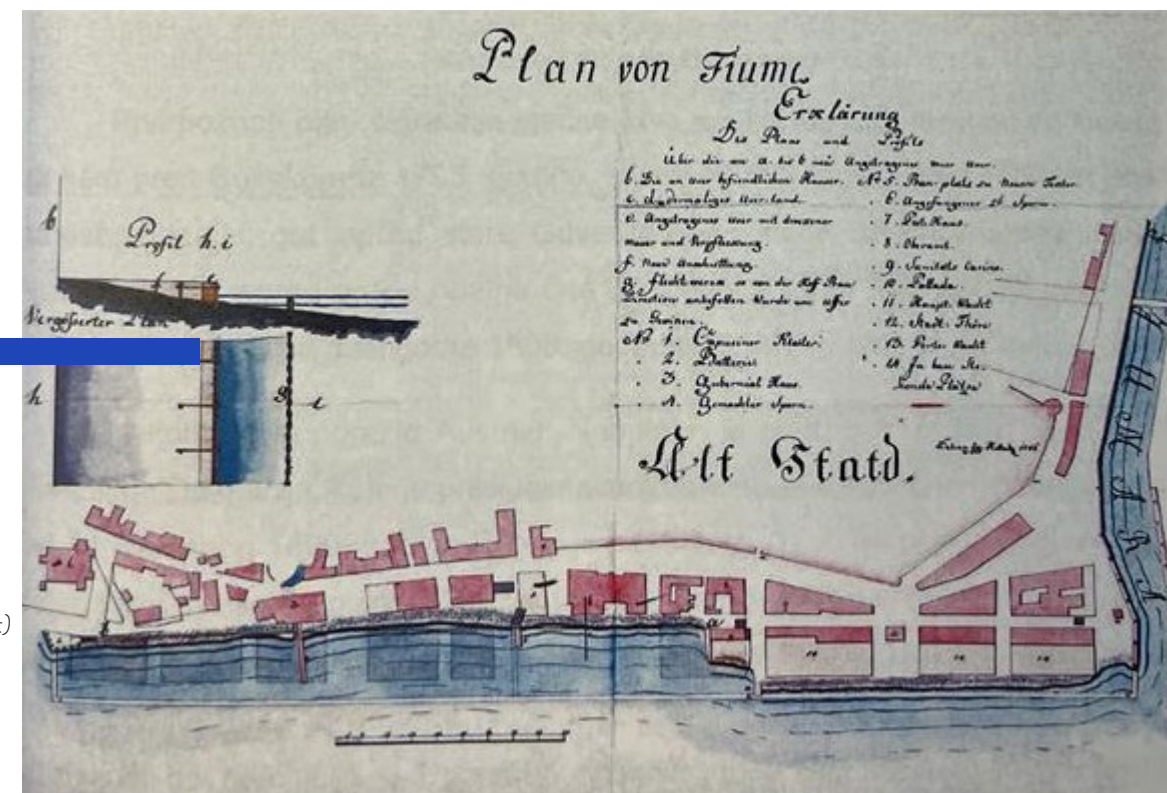
western part of the developmental axis is significant due to its coastal, spatial, environmental, and other values that can serve as the basis for development programs and the characterization of this city sector (Grad Rijeka/The city of Rijeka, 2007). The General Urban Plan designates and positions the areas of the Port of Rijeka as spaces within the national infrastructure system of high significance (Bralić, 2017). Despite

the city planners' awareness of the significance of the port zones, their status has been identified as ambiguous in the General Urban Plan of the city of Rijeka.



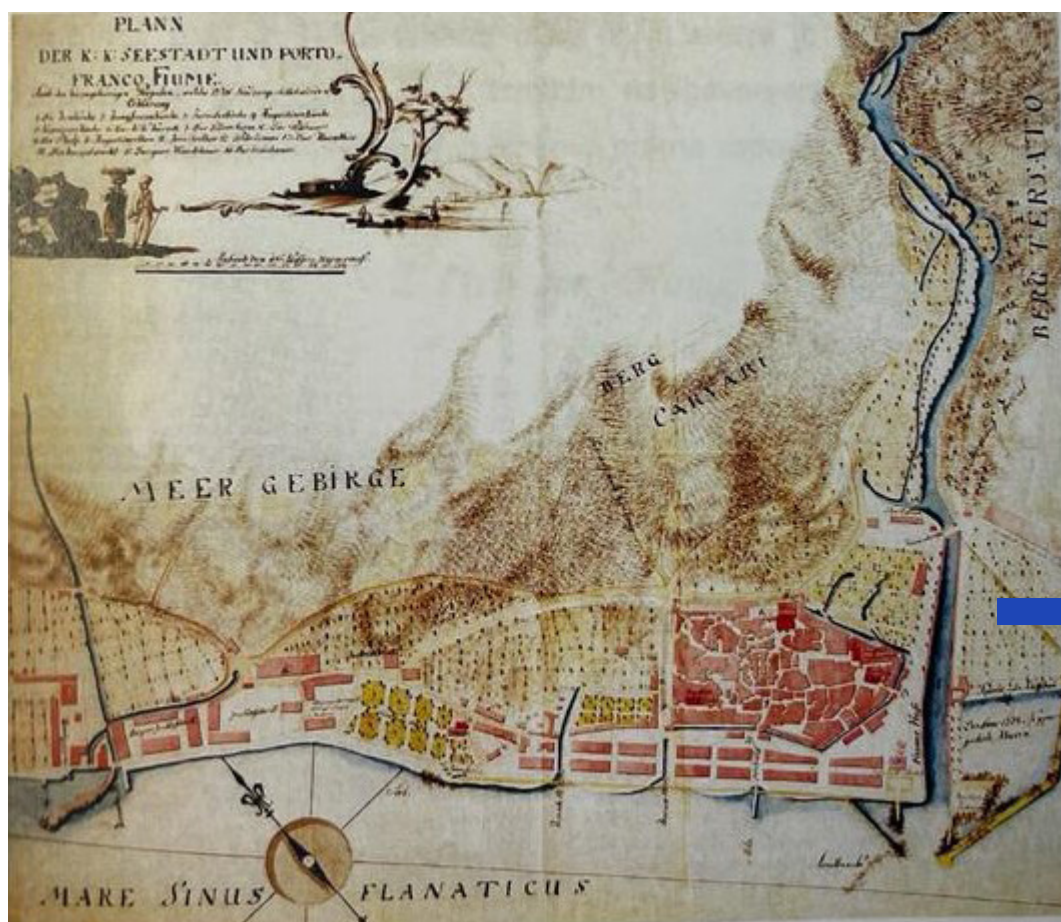
1779

Figure 3.19 (left) Rijeka as Corpus Separatum Adnexum, an autonomous region within the framework of the countries of the Holy Crown of Hungary. (Source: DAR)



1786

Figure 3.21 (right) City plan from the year 1786, Hollub (Source: National Archives, Budapest)



1778

Figure 3.20 (left) Plan of the coastal city and free port of Rijeka from the year 1778 (Source: Kriegsarchiv, Vienna)



1795

Figure 3.22 (right) City plan from the year 1795, Hollub (Source: Kriegsarchiv, Vienna)

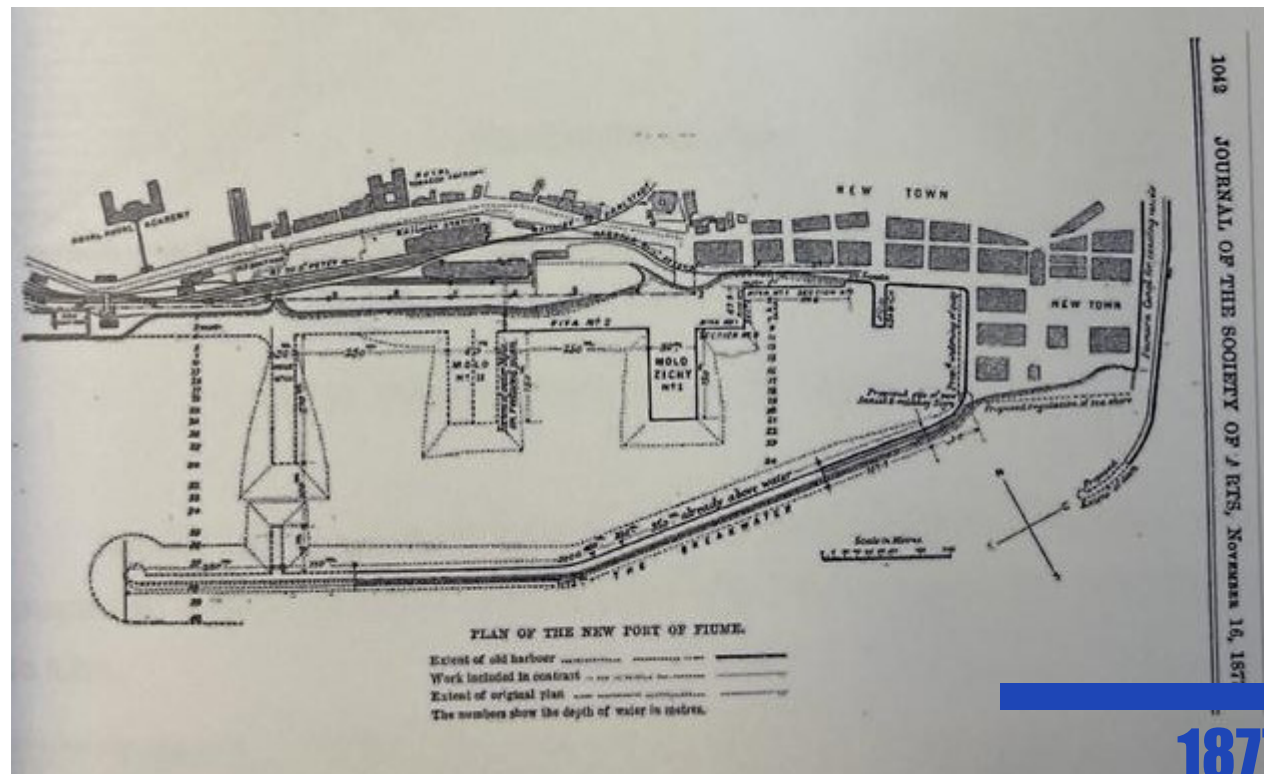
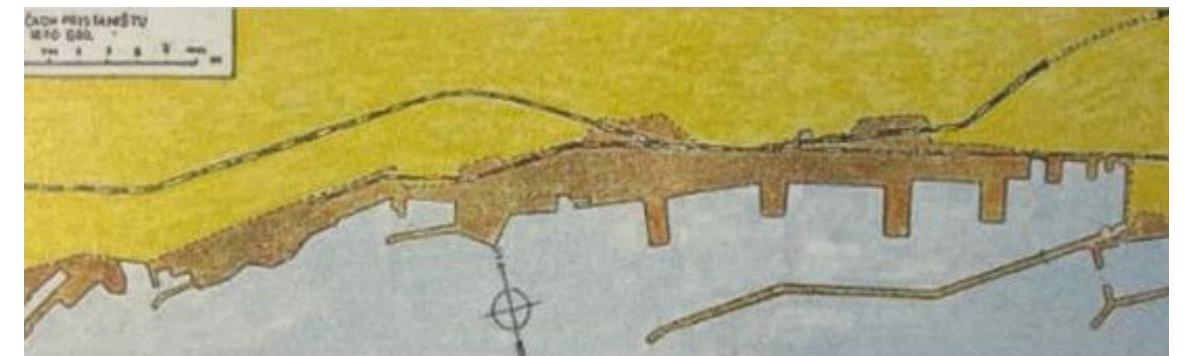


1843

Figure 3.23 (left)
"Variation Plan of
the Port, Schemfil,
1843 (Source: DAR)

1870

Figure 3.25 (right)
Port Reclamation
Plan from 1870
(Source: DAR)

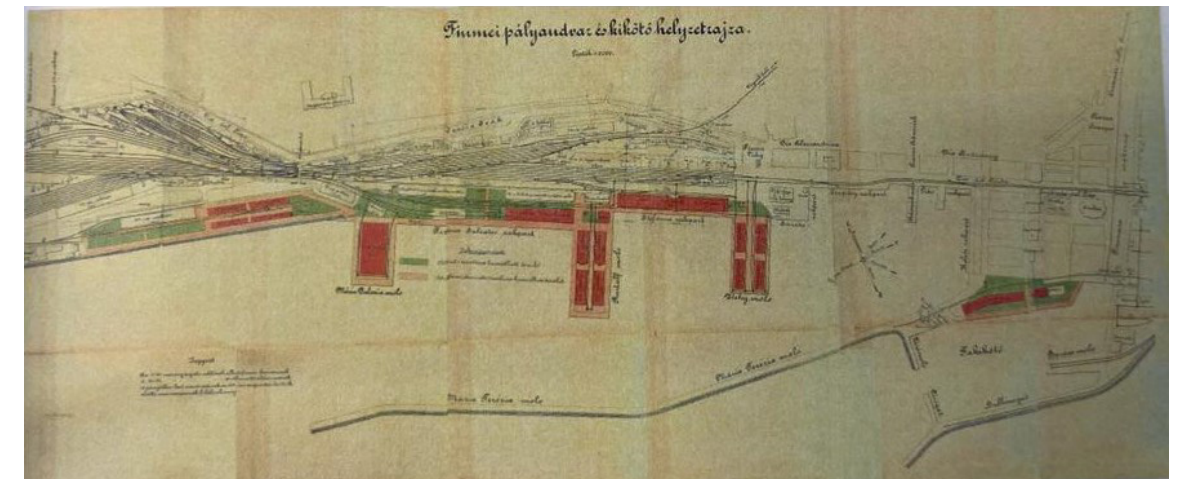


1877

Figure 3.24 (left)
Plan of the New Port
from 1877 (Source:
Journal of the
Society of Arts)



1907

Figure 3.26 (right)
Port plan from
1907 (Source:
DAR)



Litoral industrial zones enclosed zones inaccessible to public access



-  Litoral industrial zones inaccessible to public
-  Old Town Rijeka/downtown



A significant concern within the industrial port zone revolves around boundary issues, as highlighted in a thought-provoking panel discussion titled ‘METROPOLIS: Perspectives of the New City.’ Moderated by Maroje Mrduljaš and organized by the Society of Architects Rijeka on November 2023, the panel drew attention to the current classification of industrial port zones as ‘free customs zones,’ designating them as enclosed areas

inaccessible to the public. To address this, the organizer proposed a guided walking tour within the port zone, intending to familiarize citizens with the protected ‘port warehouses.’ However, the panel acknowledged the formidable challenge of acquiring the necessary documents and permissions from port authorities to facilitate public visits to the port zone. According to the Mayor of Rijeka, Marko Filipovic, changing the status of individual port

zones from ‘free customs zones’ to city zones is imperative for public accessibility. Consequently, the issue extends beyond legislative boundaries to encompass the boundaries of local residents (Filipović, et al., 2023). The map above illustrates a significant portion of the waterfront that remains inaccessible to the public.

Litoral industrial zones _ national infrastructure system of high significance



Figure 3.27 The General Urban Plan designates and positions the areas of the Port of Rijeka as spaces within the **national infrastructure system of high significance** (Bralić, 2017) (Source: Google Earth)

- Litoral industrial zones
- ⋯ Old Town Rijeka/downtown

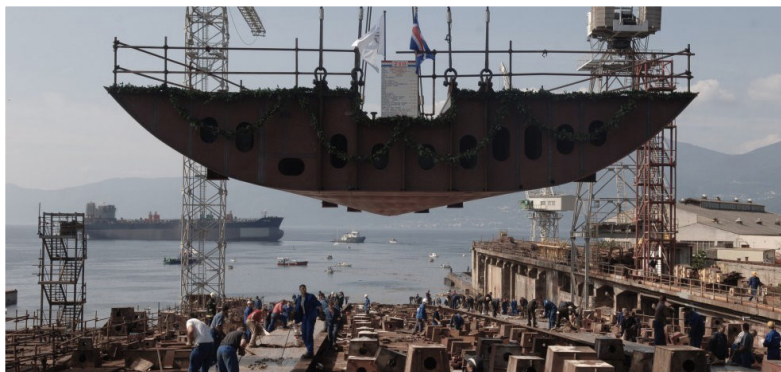


Figure 3.28 The litoral industrial shipbuilding zone // 3.MAJ Shipyard (Source: tportal.hr)

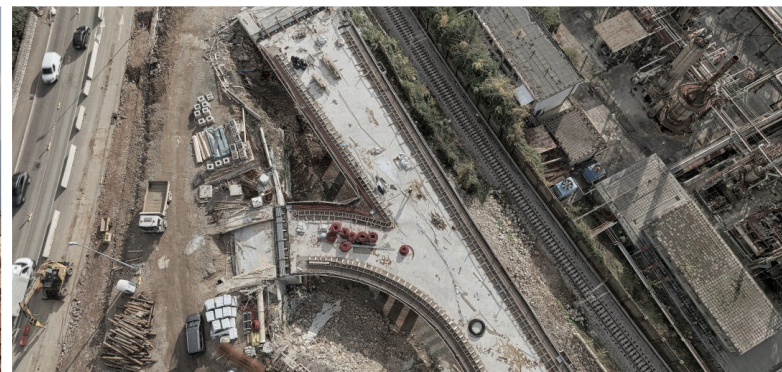


Figure 3.29 The litoral industrial zone - national infrastructure system of high significance// Port of Rijeka (Source: povezanahrvatska.eu)

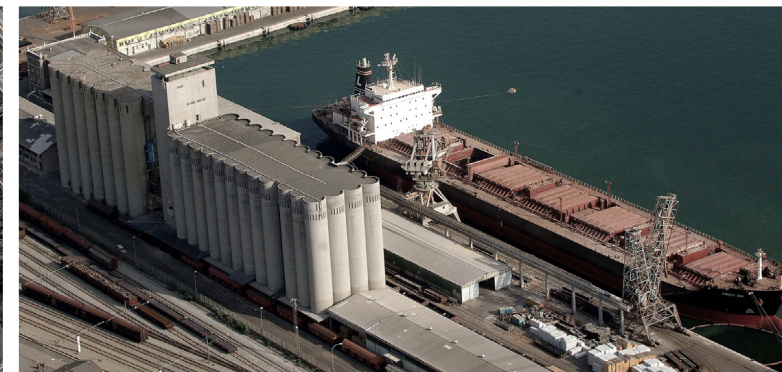


Figure 3.30 The litoral industrial zone - national infrastructure system of high significance// Port of Rijeka (Source: lukarijeka.hr)

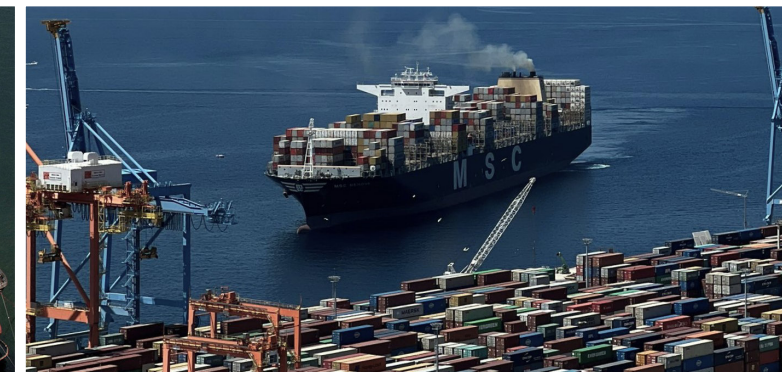


Figure 3.31 The litoral industrial zone - national infrastructure system of high significance// Port of Rijeka (Source: Merlak)

Litoral industrial zones _ 'unclear'



Figure 3.32 In regard to the coastal port zones, certain areas have been labelled as **'unclear'** and require urban transformations as envisioned by the city planners (Grad Rijeka/The city of Rijeka, 2007) (Source: Google Earth)

- Litoral industrial zones
- ⋯ Old Town Rijeka/downtown
- 'Unclear' urban zones



In regard to the coastal port zones, certain areas have been labelled as 'unclear' and require urban transformations as envisioned by the city planners (Grad Rijeka/The city of Rijeka, 2007):

1. The areas along the southern side of Zvonimirova Street and on both sides of Liburnijska Street, as well as cross-connections (both for vehicular and pedestrian traffic), are particularly

crucial in the zone accessing the former Torpedo site, as it represent the city's planned exit towards the sea.

2. The Torpedo site, including its broader contact area with Metis (communal waste company), provides significant spatial and communication possibilities for the waterfront.

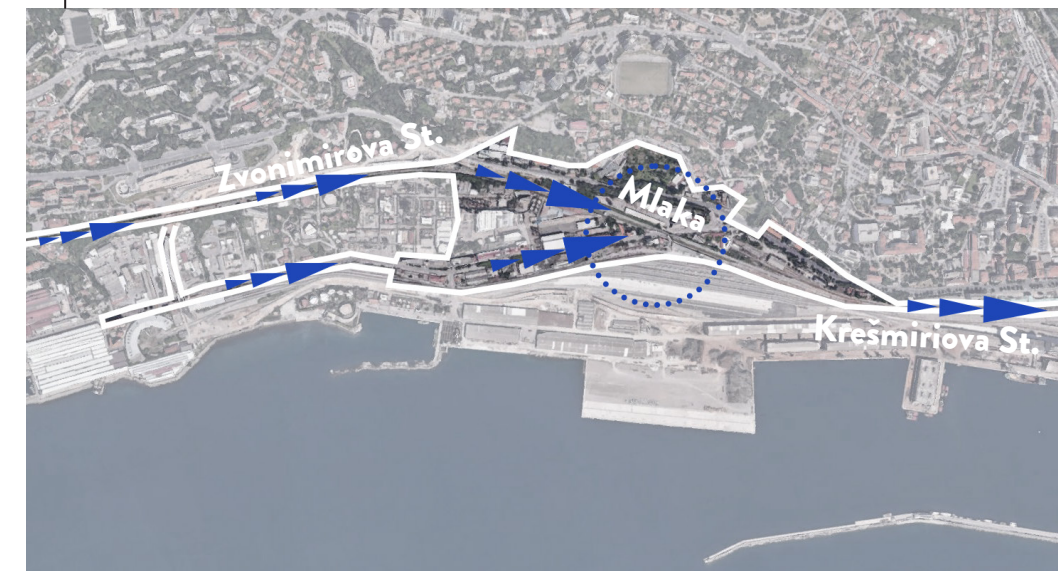
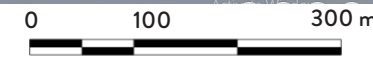
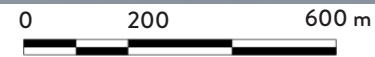
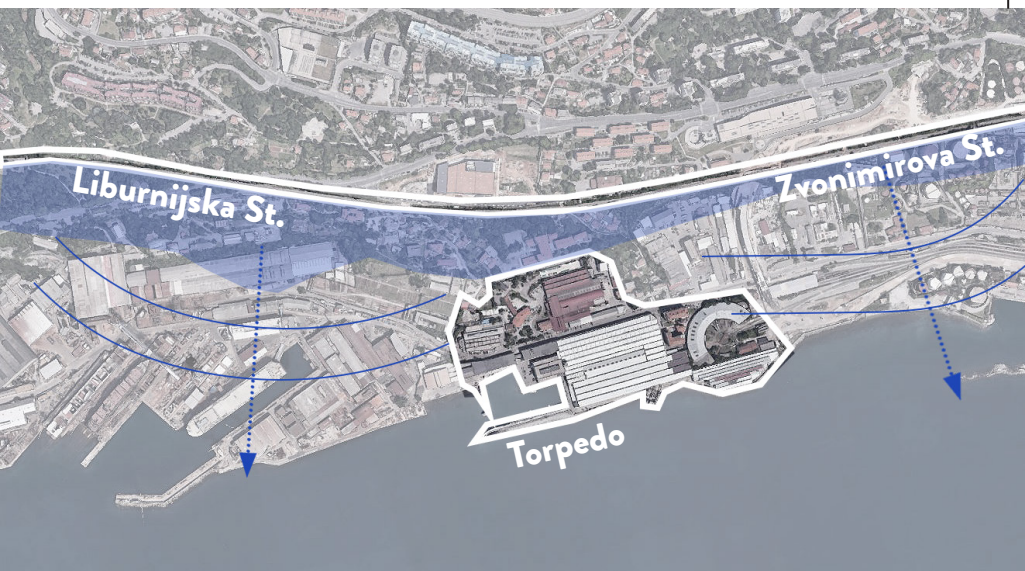
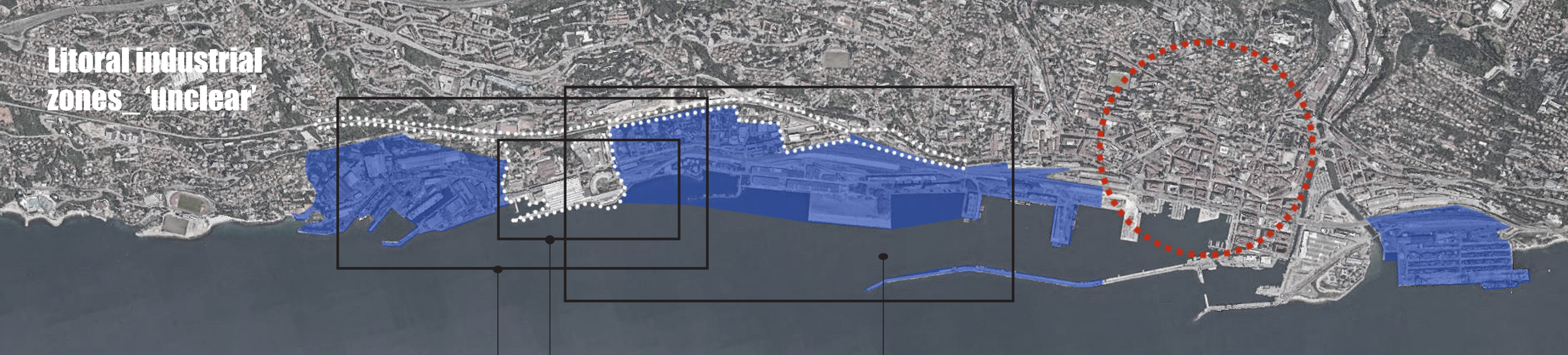
3. The Mlaka area presents exceptional opportunities for reconstruction and

the creation of high-quality urban space, serving as the western gateway to the city centre. The concentration of existing (Krešimirova and Zvonimirova streets, railway) and planned (3rd corridor, D-403 road, high-speed urban railway) transportation infrastructure and routes in this location becomes an advantage rather than a drawback for the space.

These map-featured elements

collectively form urban corridors, or as designated in the General Urban Plan, urban axes. They possess the capacity to not only revitalize the individually transformed urban zones but also foster integrated, multifunctional urban expansions. Their strategic positioning and connection to the historical industrial maritime heritage open up a myriad of prospects.

Litoral industrial zones 'unclear'



1. 'unclear' zone

2. 'unclear' zone

3. 'unclear' zone

Drawing attention to the highlighted 'unclear' zones, it becomes evident that they correlate and converge around the Western Wing of the Rijeka Port authority. Based on the shift in designation according to the General Urban Plan of the city of Rijeka, it appears that this point is an undefined zone breaking the boundaries of Rijeka Port towards the waterfront. Presently, this area not only offers the most immediate observations of the

infrastructure and structures within the inactive port zone, accessible through closed gates and formidable fences, but it also serves as a focal point for various programs linked to **Milutin Barać Street**, colloquially recognized as **Industrial Street**. Functioning as a central axis, it runs parallel to Liburnijska and Zvonimirova streets, extending from the west, beginning at the 3. Maj shipyard, to the east, concluding at Mlaka.

The city's General Urban Plan suggests that this area, marked by distinctive features, could potentially become a newly valued urban space. Additionally, significant investments in surrounding traffic infrastructure highlight the urgent need for a reevaluation and comprehensive urban development in this zone. However, the absence of a detailed vision from city authorities hinders effective planning. For this thesis, the western wing of the port is an

ideal case for urban intervention due to its recognized and regulated status by the city governance. Transforming this site is not only essential for revitalizing its immediate surroundings but also a significant opportunity for enhancing the city's overall urban landscape.

Novi Sad



3.4.3 State of Industry in Novi Sad

The Industrial Zones in Novi Sad were established in response to the rise of environmentally harmful technologies. The plan to relocate industries began in 1950 and was completed by 1974. This involved not only moving industries but also update the railway junction, redesigning the canal systems, and renovating port areas. These changes required complex technical and engineering work to support the construction of new industrial facilities. The term “industrial zone” in Novi Sad covers areas to the north and south of the canal. Some of the first factories in these zones included Jugodent, Jugoalat, Neoplanta, Novkabel, and others. During the early development stages, many of these industrial buildings were designed by Engineer Ilija Kostic. Today, the industrial zone is seeing the emergence of various

commercial structures as investors and architects work together to create distinctive architectural features that enhance the overall cohesiveness of the zone. (Arsenijev, 2010)

The industrial landscape of Novi Sad follows to a structured urban plan, predominantly concentrated in the northern precincts of the city, delineated as Industrial Zones North I, II, III, and IV. Predominantly, the city serves as the nucleus for two pivotal sectors: the manufacturing industry and the information technology (IT) sector.



Figure 3.33 (right)
One of the first boulevards built in Novi Sad (Source: Facebook)



Figure 3.34 (down)
Industrial zone North III before its construction. (Source: Facebook)

Novi Sad CITY AND THE INDUSTRY

LEGEND

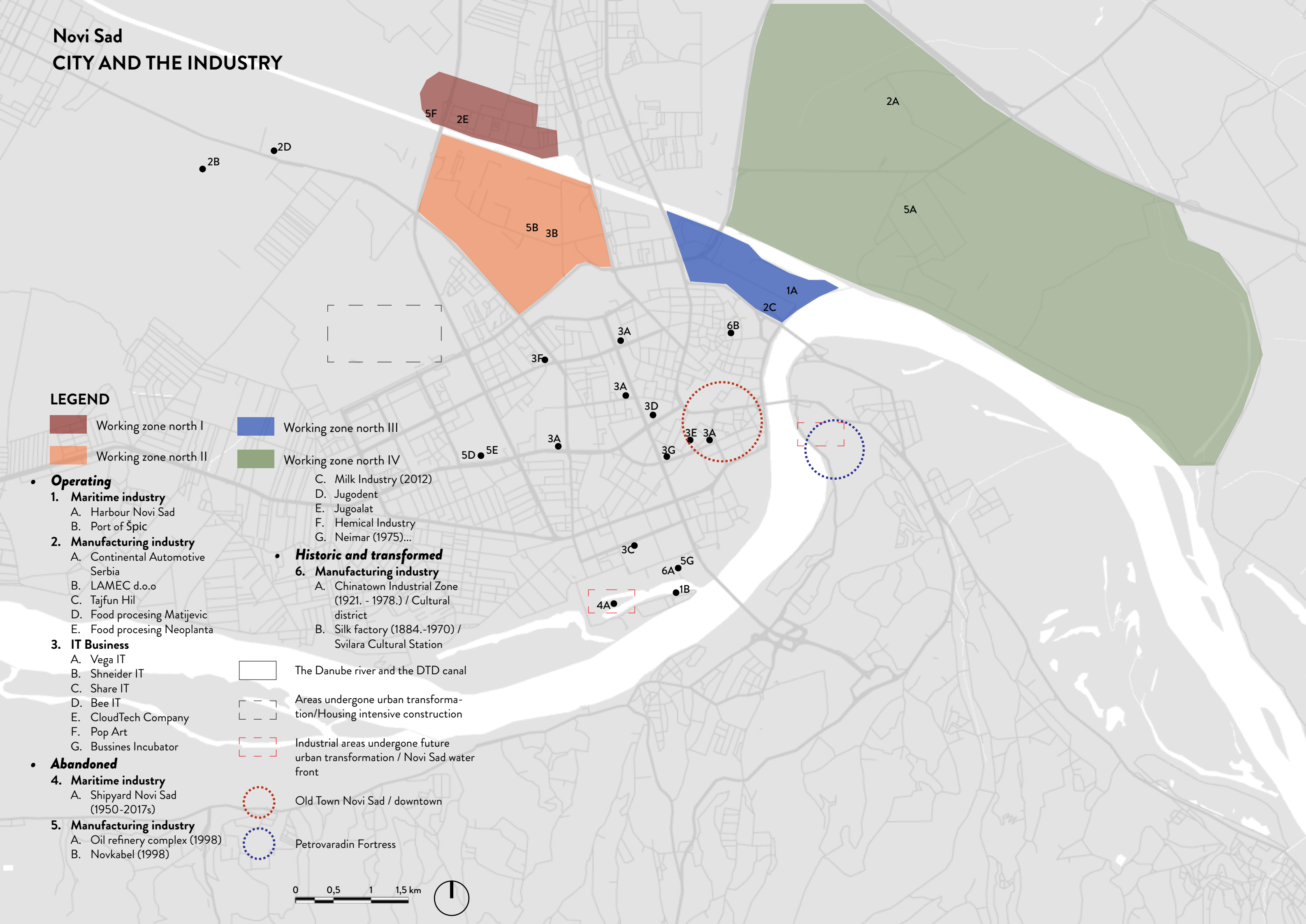
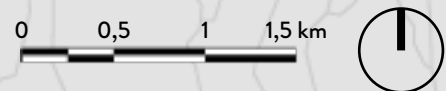
- Working zone north I
- Working zone north II

- Working zone north III
- Working zone north IV

- **Operating**
 - 1. Maritime industry**
 - A. Harbour Novi Sad
 - B. Port of Špic
 - 2. Manufacturing industry**
 - A. Continental Automotive Serbia
 - B. LAMEC d.o.o
 - C. Tajfun Hil
 - D. Food procesing Matijevic
 - E. Food procesing Neoplanta
 - 3. IT Business**
 - A. Vega IT
 - B. Shneider IT
 - C. Share IT
 - D. Bee IT
 - E. CloudTech Company
 - F. Pop Art
 - G. Bussines Incubator
- **Abandoned**
 - 4. Maritime industry**
 - A. Shipyard Novi Sad (1950-2017s)
 - 5. Manufacturing industry**
 - A. Oil refinery complex (1998)
 - B. Novkabel (1998)

- **Historic and transformed**
 - 6. Manufacturing industry**
 - A. Chinatown Industrial Zone (1921. - 1978.) / Cultural district
 - B. Silk factory (1884.-1970) / Svilara Cultural Station

- The Danube river and the DTD canal
- Areas undergone urban transformation/Housing intensive construction
- Industrial areas undergone future urban transformation / Novi Sad water front
- Old Town Novi Sad / downtown
- Petrovaradin Fortress



03 Understanding the Current Urban Dimension of Novi Sad and Rijeka

Within the demarcated industrial zones, the municipality has categorized specific zones as the “Free Zones of Novi Sad.” These enclaves accommodate a multifaceted spectrum of industrial operations, inclusive of manufacturing processes such as finishing, processing, and assembly, along with ancillary service functions, including warehousing, loading, unloading, repackaging, and product labeling. These zones offer an additional allure, encompassing specific fiscal and customs incentives, which heighten their attractiveness to potential investors. (Pajović, 2017) Nevertheless, despite favorable conditions, numerous warehouses and land parcels remain vacant due to the economic downturn. Investors do not perceive these locations as attractive for capital investment. The reason for this is the process of deindustrialization and privatization of many state-owned enterprises, which has led to the creation of a competitive business environment.

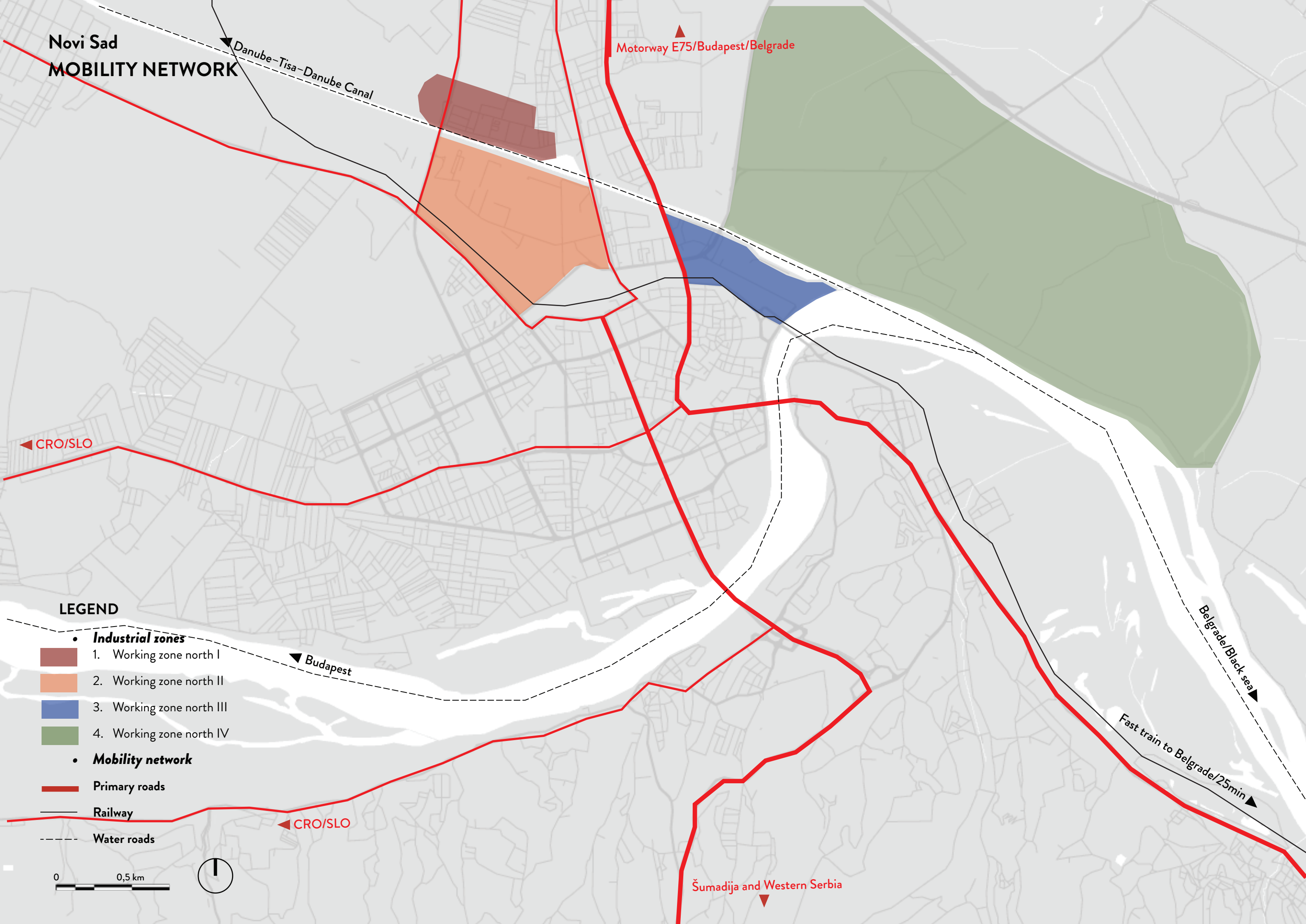
It is noteworthy that IT enterprises demonstrate a tendency for sites located in closer proximity to the city’s central area. Novi Sad had a thriving IT community, including a substantial number of IT professionals, software developers, and tech enthusiasts. The city is home to many IT companies

and startups. Contrary to the benefits, the process of industrialization is threatened by certain risks, the most significant of which is the prevailing stereotype that Novi Sad should not be developed as an industrial but as a commercial and tourist center, which obviously does not have any economic effects.



Figure 3.35 (right) Industrial zones north III and IV (Source: Marko Otlokan)

Novi Sad MOBILITY NETWORK



Motorway E75/Budapest/Belgrade

Danube-Tisa-Danube Canal

CRO/SLO

Belgrade/Black sea

Fast train to Belgrade/25min

Šumadija and Western Serbia

LEGEND

Industrial zones

- 1. Working zone north I
- 2. Working zone north II
- 3. Working zone north III
- 4. Working zone north IV

Mobility network

- Primary roads
- Railway
- Water roads

0 0,5 km



Budapest

CRO/SLO

03 Understanding the Current Urban Dimension of Novi Sad and Rijeka



Figure 3.36 (left)
Works on the
construction of
the Zezelj bridge.
(Source: gradnja.rs)



Significant investments in Novi Sad's infrastructure have made it attractive to foreign companies, especially in the growing IT market. This increased popularity is backed by ongoing investments in infrastructure, making Novi Sad a more appealing destination for foreign investments. Over the past decade, there has been noticeable progress in improving transportation in the city, including the reconstruction of the Zezelj Bridge, which was damaged in the 1999 NATO bombing.

A major project benefiting both Novi Sad and Serbia is the construction of a high-speed railway connecting Belgrade and Novi Sad. This advancement allows people to travel between the two cities in just 25 minutes, proving crucial for commuters working in one city and living in another—a trend on the rise. Looking

ahead, another bridge is planned for completion by the end of 2025, indicating a continued commitment to enhancing connectivity and economic growth in the region.

Contrary to the benefits, the process of industrialization is threatened by certain risks, the most significant of which is the prevailing stereotype that Novi Sad should not be developed as an industrial but as a commercial and tourist center, which obviously does not have any economic effects.

Figure 3.37 (up)
The new bridge on
the Canal Danube
Tisza Danube
(Source: gradnja.rs)

Figure 3.38 (right)
New high-speed
railway Belgrade
Novi Sad
(Source: gradnja.rs)



Novi Sad's industrial landscape reflects a dynamic interplay of historical initiatives, contemporary challenges, and emerging opportunities. The dichotomy between traditional industries and the burgeoning IT sector underscores the need for strategies in urban planning and economic development to ensure sustained

growth and resilience in the face of changing global dynamics.

In order to gain a thorough insight into the most accurate evaluation of the industrial landscape in Novi Sad, the chapter wraps up by introducing the SWOT analysis approach.

SWOT

Strengths (S)

- Novi Sad is a cultural and artistic center, hosting various festivals, theaters, galleries, and museums. This cultural richness can attract tourists and foster local creative talent.
- The presence of the University of Novi Sad and other educational institutions provides a strong foundation for research, innovation, and a skilled workforce, particularly in the field of information technology.
- Novi Sad's strategic location on the Danube River offers opportunities for river transport, tourism, and recreation, contributing to the local economy.
- The city has seen economic growth, diversifying beyond traditional industries into technology,

manufacturing, and services, which can enhance employment opportunities and prosperity.

- Novi Sad's multicultural environment promotes tolerance, cross-cultural exchange, and a rich blend of traditions, contributing to its appeal as a welcoming and inclusive city.
- Novi Sad was part of the growing trend of IT outsourcing and nearshoring, with companies from Western Europe and North America establishing development centers in the city due to the skilled workforce and cost-effectiveness.
- Novi Sad has observed a rising influx of young individuals, primarily hailing from its neighboring areas (Bosnia and Herzegovina, Montenegro) and Russia.

problems such as pollution and waste management, which need to be addressed for the well-being of its residents.

- Novi Sad is experiencing a surge in its population, resulting in a shortage of available apartments. This heightened demand has led to an increase in apartment prices in the local market.

Weaknesses (W)

- The city may face infrastructure issues related to public transportation, road networks, and utilities, which could block the ease of doing business and quality of life.
- While there is economic growth, there may be pockets of high unemployment, particularly among young people, necessitating targeted employment initiatives.
- Like many urban areas, Novi Sad grapples with environmental

assessment of the industrial condition in Novi Sad

Opportunities (O)

- Novi Sad has the potential to become a regional technology hub, attracting investment and creating high-value jobs in IT and related fields. Engaging citizens in public discussions, surveys, and media outlets.
- The city can further capitalize on its cultural events, historic sites, and the Danube River to develop its tourism sector, attracting both domestic and international tourists.
- Expanding educational programs, especially in technology and innovation,

can help Novi Sad become a magnet for students and a hub for research and development.

- There are opportunities for Novi Sad to lead in sustainable development, from green energy projects to eco-friendly urban planning.
- Leveraging the currently vacant urban spaces to shift key industrial operations away from the city center and create a distinct industrial network independent of the residential areas.

Threats (T)

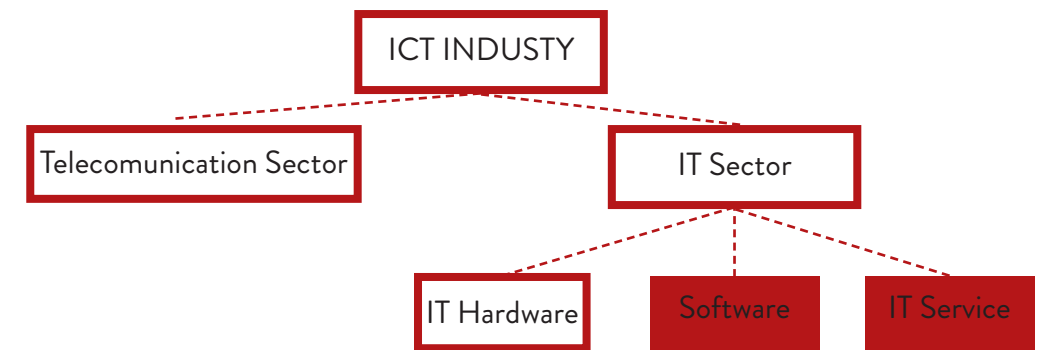
- Global and regional economic fluctuations can impact foreign investments and economic growth in Novi Sad, requiring adaptive economic policies.
- As the IT sector grows, Novi Sad may face competition from other cities in Serbia and the region for tech investments and talent.
- Ongoing environmental issues and the impacts of climate change can pose significant threats to the quality of life and future development in the city.
- The extensive and rapid construction

of residential buildings in Novi Sad has become a dominant focus, and this emphasis poses a significant risk to the city's urban layout and overall structure. This situation implies that the primary focus of development has been on constructing new residential complexes, often at a pace that may not consider the need for adequate urban planning and infrastructure development. As a result, it can lead to challenges related to city design, transportation, environmental considerations, and the overall quality of urban life.

3.4.4 The IT Industry potential with emphasis on the desirable locations

In 2021, IT expenditure in Serbia showed consistent growth compared to the previous year. This expansion of the IT market can be attributed to several factors, including the strengthening of the country’s economy, an increase in public procurement and government contracts, and notably, the rise in prices among domestic IT providers. In many cases, these providers offered their services at rates significantly lower than what their Western European counterparts charged for similar expertise. As a result, the Serbian IT market saw a year-on-year growth of 9% in 2021, reaching a total of €736 million. Projections indicate that the overall IT spending is expected to surpass €950 million by 2025, based on a compound annual growth rate (CAGR) of 7% over four years. Similar to other developing markets in the Central and Eastern European (CEE) region, Serbia’s IT market is shifting its focus towards software and services. (Đuro Kutlača, Lazar Živković, Dijana Štrbac, Dušica Semenčenko,

Sanja Popović-Pantić, 2018) In Vojvodina, there exists a favorable ecosystem for research and development as well as business incubation. The universities in Novi Sad, catering to around 40,000 students, serve as a strong reservoir of knowledge and skills. Concurrently, the research and development initiatives within these universities facilitate the birth of new enterprises. In Serbia, approximately 1,000 students graduate annually in the fields of electrical engineering and computer sciences, constituting about 7% of the total number of graduates. In Vojvodina, there exists a favorable ecosystem for research and development as well as business incubation. The universities in Novi Sad, catering to around 40,000 students, serve as a strong reservoir of knowledge and skills. Concurrently, the research and development initiatives within these universities facilitate the birth of new enterprises. In Serbia, approximately 1,000 students graduate annually in the fields of electrical engineering and computer sciences, constituting about 7% of the total number of graduates.



On a different note, the provincial government of the Autonomous Province of Vojvodina has effectively extended its support to recently established ICT companies. This assistance is primarily channeled through the establishment of business incubators, forming part of a broader effort to enhance the socio-economic landscape. Within the realm of information technology, encompassing hardware, software, and services, it can be observed that the software industry holds the most promise in Vojvodina. To be more specific, Vojvodina hosts several small and medium-sized software enterprises. (Katic Andrea, Milosev Ivana, Raletic Sasa, 2013) Novi Sad, Serbia, has a growing and vibrant IT sector with numerous IT companies and tech startups. While the landscape is continually evolving, here are some well-known IT companies in Novi Sad: Microsoft Development Center Serbia, Vega IT Sourcing, Levi9 Global Sourcing, Itkonekt etc.

In recent years, the expansion of prominent IT companies has introduced in a notable trend in urban development, characterized by the adaptive reuse of old structures within newly landscaped surroundings. An illustration of this phenomenon is the Workers’ University Building, acquired by Vega IT from the municipal

authorities. The refurbishment of this edifice was executed within an exceptionally condensed timeframe. (Conic, 2022)

A further instance of this architectural transformation pertains to the restoration of one of Novi Sad’s iconic modernist landmarks, namely the Novkabel building situated within the Industrial Zone. Erected in 1983 as a production and administrative facility of the specialized “Novkabel Electronics, Computers, and Automation” (ERA) program under the protection of the privatized entity “Novosadska fabrika kabela AD,” this structure has undergone a comprehensive overhaul with the expressed objective of reimagining it as a contemporary business complex aligned with the contemporary requisites of the omnipresent IT sector. The project, denominated the ‘NS Office Park,’ reached its peak in 2022, thereby rendering this four-decade-old building fully operational. (Conic, 2022)



Figure 3.39 (left)
Novkabel (computer and cable factory) tower before reconstruction (Source: Nevena Popovic)

Figure 3.40 (up)
Novkabel tower reconstructed and bought by It company (Source: gradnja.rs)

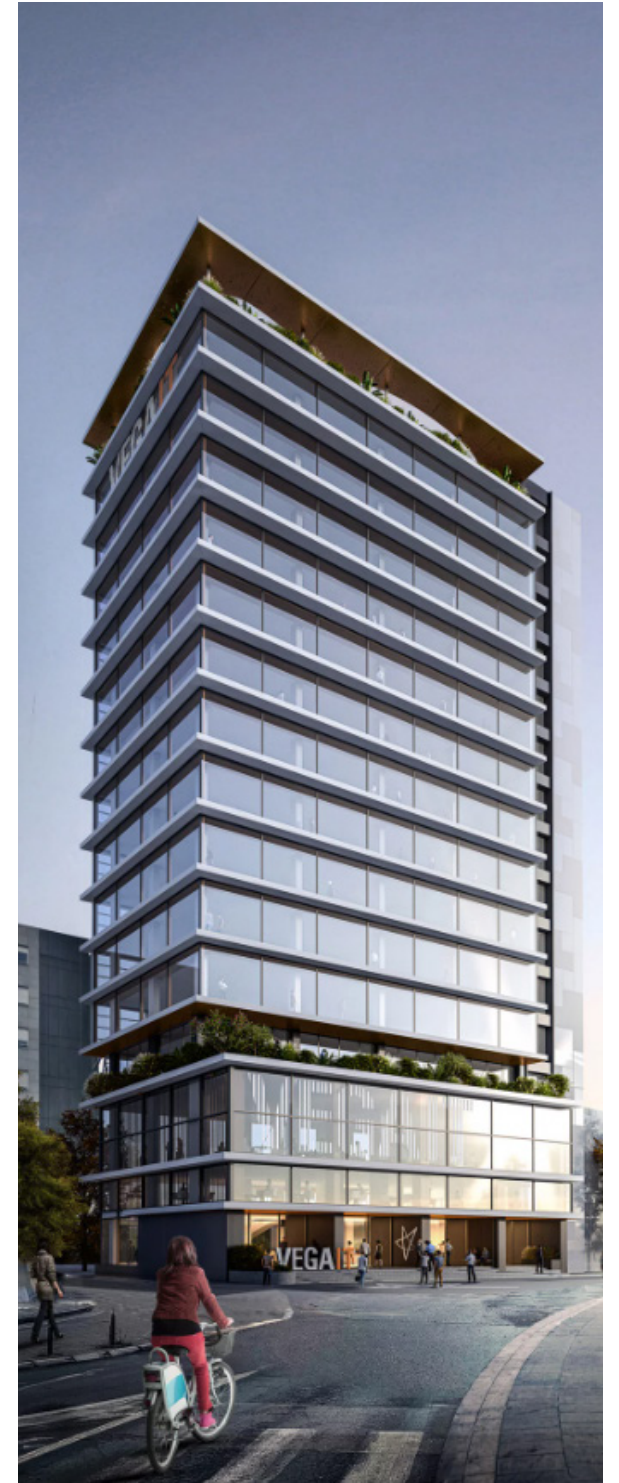
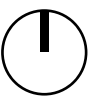


Figure 3.41 (left)
Former appearance of the Workers' university building (Source: Facebook)

Figure 3.42 (up)
The workers' university building after the reconstruction of the Vega it company (Source: gradnja.rs)



Figure 3.43 Development of the city around the river and its expansion towards agricultural areas (Source: Google Earth)






The IT sector's growth, coupled with the supportive academic and governmental environment in Vojvodina and Novi Sad, has not only had a substantial economic impact but has also left a mark on the urban structure of the city, fostering innovation and adaptive urban revitalization.

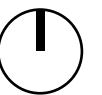
In addition to the development of private company infrastructure, the construction of residential buildings continues to play a dominant role in the transformation of urban structure. The

most significant indicator of the city undergoing dramatic urbanization is reflected in the number of constructed residential units. Between 2011 and 2020, 20,142 apartments were built. During the same period, the city's population increased by 21,447, implying that approximately one apartment was constructed for each new resident in Novi Sad. (Slobodan Jović, Dragana Konstantinović, Igor Peško, 2022)

The urban planning paradigm necessitates adjustment to accommodate the burgeoning number of residential units within the available urban space. The current shift is manifesting in the construction of extensive residential and mixed-use complexes, indicating substantial investment value and providing favorable locations for their realization.



-  Old Town Novi Sad/downtown
-  Popular Industrial Zones
-  Boulevards






Although this developmental approach has existed in Serbia for some time, its intensified execution started post-2014. These projects are conceived to revitalize abandoned or neglected urban areas and contribute to the sustainable development of the city by incorporating new ones. In practice, however, the primary focus lies in maximizing profits through the sale of apartments and office spaces. This is primarily facilitated by financial support from public funds and assistance from the administration, which not only

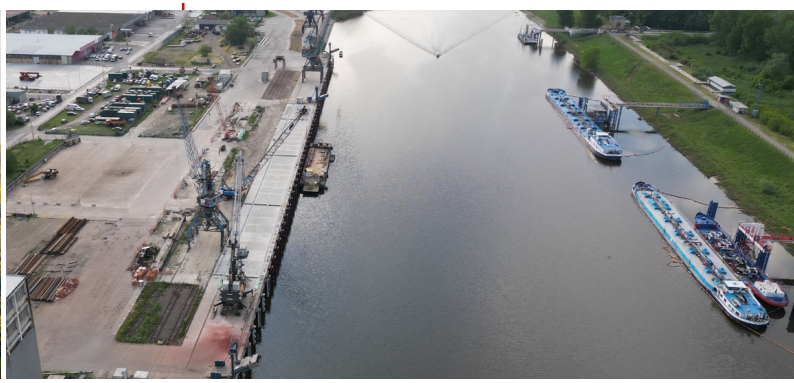
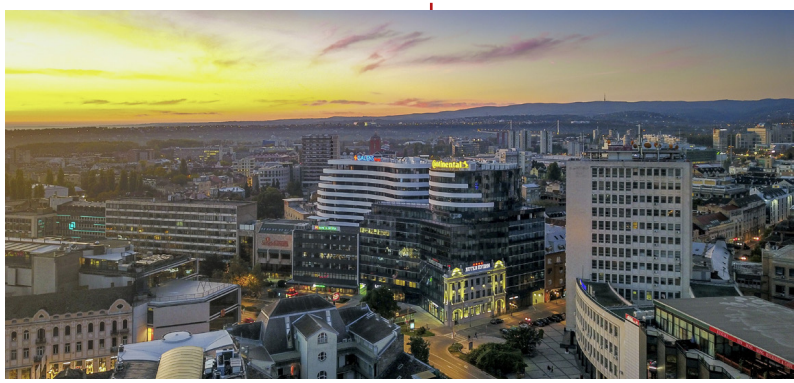
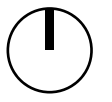
furnishes planning background but also modifies the legal framework. Notably, large mixed residential and commercial complexes have materialized in various parts of Novi Sad, aligning with the envisioned development sites in the Master plan, aptly designated as “universal city centers.” (Slobodan Jović, Dragana Konstantinović, Igor Peško, 2022)

To foster progress in urban development while simultaneously satisfying both residents and investors, it is crucial for the government to actively participate in the careful cultivation of new and attractive investment locations. I have identified several overlooked locations in the city with considerable potential for developmental initiatives. Additionally, I underscore the essential role of the Information Technology (IT) industry in enhancing urban efficiency and connectivity, thereby contributing to economic prosperity. The integration

of emerging technologies not only facilitates economic success but also enhances the overall quality of life in the city. Recognizing the crucial importance of strategic planning, collaborative development initiatives, and the catalyzing influence of the IT sector is vital for establishing a comprehensive and sustainable urban development trajectory.



-  Old Town Novi Sad/downtown
-  Popular Industrial Zones
-  Boulevards





1. Desirable location for residential constructions



2. Desirable location for owners of industrial facilities



04

**Framework of the
Productive City**

4.1 Industrial Trends

The contemporary productive city is grounded in *the new sectors that are more digital, service-oriented, low carbon, knowledge-based and connected to their cultural-industrial context* (Mista Team, 2022). De-industrialisation is an occurring trend in numerous European cities due to the growth of the tertiary sector. This is the fertile ground for the re-integration of production into cities and urban areas by designing multifunctional spaces and mixed-use neighbourhoods. Therefore, the framework of the productive city provides a sustainable way to carry out urbanisation within the fragile urban fabric and promote a circular economy (Mista Team, 2022).

Industrial activities are transformed by innovation and they are exposed to constant change. Those changes may take place in many forms, such as virtual, sociological or physical space. Therefore, urban planning and architecture play a major role in investigating the connection between production activities and territories. Allocation of suitable industrial branches, manufacturing and production within the urban fabric of contemporary cities is a complex task. Expanding urban populations,

shortage of housing, urban sprawl, and unaffordability are just some of the major issues that contemporary cities are facing. As the cities are running low on buildable land, the land once used for robust industrial activities becomes a target of poor management or large-scale luxurious redevelopment. Even more so, the challenges are greater in the post-socialist or so-called *transitional societies* of the European East due to the privatization process and ownership struggles. However, appropriate management of the *transformative* power of the urban industrial zones is needed to establish a healthy and diverse local economy and assure workplaces, innovation and inclusivity (Mista Team, 2022).

4.2 The Manufacturing Sector in the Urban Context

Manufacturing remains one of the main components of the production process. De-industrialisation of many European metropolitan regions has given a way to the reindustrialisation of some. The research of Mista Team, ESPON 2022 shows that the effectiveness of production in each metropolitan region highly depends on the relationship between sectoral and spatial distribution. Therefore, each region must be observed according to its context.

The production of physical goods has been in decline since the end of the 1970s in developed countries. This process of de-industrialisation has been specifically evident in urban areas. Therefore, the 58 largest metropolitan regions of the European Union report that the employment share of the production sector decreased by 41%, relative to 28% in the average EU between 1995 to 2017. Until the early 2000s, the shift in industrial trends was considered to be a side effect of the service-oriented, knowledge-based and digitalised economy. However, the crisis of 2009 and COVID-19 showed that the dependency on foreign supply chains is not sustainable for the European economy. Consequently,

industrial policy is a debated issue within the European discourse. The investment and re-interpretation of the European *manufacturing sector can provide the resources and many of the solutions for the societal challenges facing the EU, such as climate change, health and ageing population, and the development of a healthy, safe and secure society and thriving social market economy* (European Commission, 2010, p. 4). Small-scale business, low-emission manufacturing and urban agriculture are some of the promoted and discussed productions to be integrated into the new mixed-use urban neighbourhoods in the New Leipzig Charta (Mista Team, 2022).

4.3 Is Production in European Metropolitan Regions Returning to the City?

Recent evidence suggests a more modest speed of de-industrialisation (or even a re-industrialisation in some cities) in the last one and a half decades (Mista Team, 2022).

The research of Mista Team, ESPON 2022 shows that the de-industrialisation was stronger in larger metros, high-income metros and metros with a high service orientation. Production has developed more favourably in middle-size and more industrial cities. Therefore, their transition in the economic sense remained more stable and the chances are that the industrial zones are still used according to their original function (Mista Team, 2022).

Generally speaking, the variety in the production sector largely depends on the geographical and historic context of each metropolitan region. However, metropolitan regions of Europe have experienced increased development in waste management and utilities, construction, and logistics than in the manufacturing sector. This data corresponds to the expanding urbanization and urban population (Mista Team, 2022).

The changing trends in urban production influence the changes in the employment sector within the production sector. Metropolitan regions mark the growth in service occupations and the high-skilled jobs sector. That is due to the concentration of so-called dispositive functions (e.g. headquarters, R&D centres, or product design) in city centres. On the contrary, improved mobility infrastructural networks allow outsourcing of certain value chain functions, such as mass production and assembly. Evidently, the functions requiring a big operational area are being displaced to the periphery of the metropolitan regions. Furthermore, the percentage of highly qualified workers (so-called white collars) is significantly higher in the European metropolitan regions than in other regions, as is the percentage of employees in medium-skilled service jobs. Considering this shift, a considerable share of the jobs in production in European metropolitan regions is in demand for office spaces (Mista Team, 2022).

To summarize, the production means have changed their form in the past

decades. Even though the production sector remains a significant driver of the economic development of metropolitan regions, its placement plays a crucial role in the urban fabric. Urbanization, population growth, highly skilled labour and housing demand power the redistribution and relocation of the production zones. The research of Mista Team, ESPON 2022 lists the

production sectors that are likely to experience the above development in metropolitan regions:

1. Utilities and logistics sector
2. High-tech and high skilled manufacturing branches
3. Consumer-oriented branches (Mista Team, 2022)

Development of production in core and wider metro region



Figure 4.1 European metro regions with at least 3 NUTS-3-Regions; 1995=100 (Source: ARDECO (JRC/EC); WIFO calculations)

4.4 References

In order to keep their productional sector as a brand in the local economy, cities should carefully manage the use of the industrial land. The examples listed by Mista Team, ESPON 2022 are showcasing just some of the cities that managed to reestablish the dialogue

between the industry and the city. Here, we are selecting and elaborating on some exemplary urban cases (Mista Team, 2022).

1. Berlin Urban Development Plan (UDP) Economy 2030

A spatial planning framework to ensure the strategic provision of land for production functions (Mista Team, 2022)

The urban plan for Berlin states that production and industrial land is the key priority to be maintained and developed.

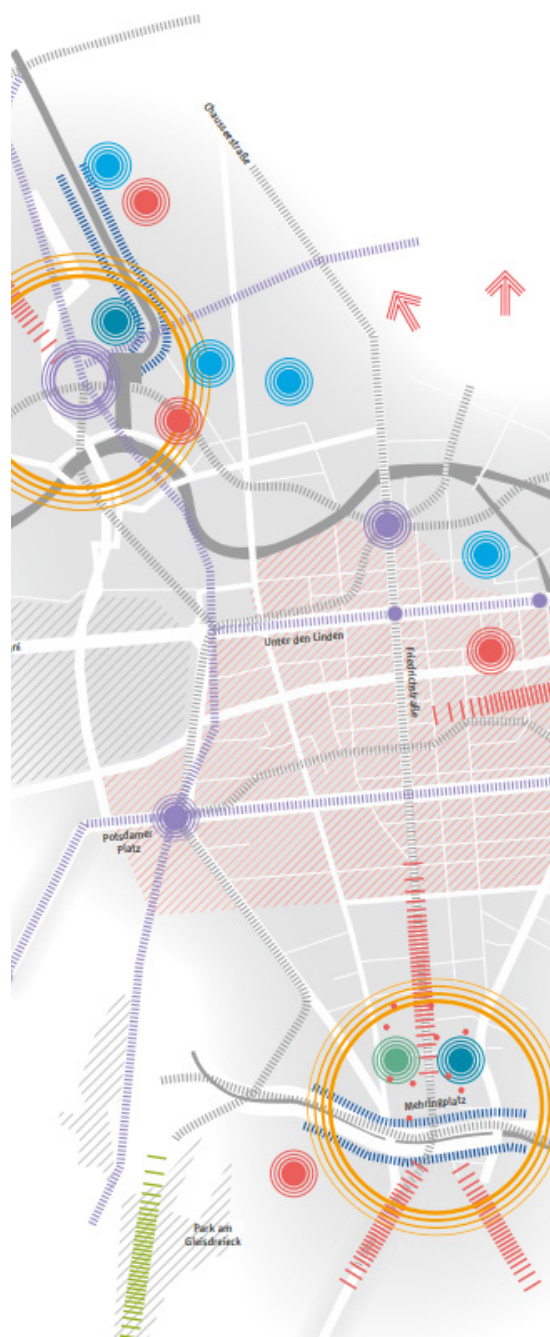


Figure 4.2 (left) Transformation Areas of Berlin (Source: Urban Development Concept Berlin 2030)



Figure 4.3 The Great Elephant on the Isle of Nantes (Source: Gilles Bonugli Kali)



Figure 4.4 Strategy of Oslo for the transformation of the fringe in Hovinbyen; Workshop with the Bryn user local group (ULG) (Source: Haakon Haanes)

2. The Ile de Nantes

Giving a new future to the industrial heritage (Mista Team, 2022)

Transformation of the former industrial shipyard zone from the 1980s into an artistic, touristic and cultural programme.

3. The Strategic Plan of Hovinbyen (Oslo)

The municipality is a driving force for innovative pilot projects (Mista Team, 2022)

The post-war urban industrial zone transformed into a controlled residential zone in 2016 supported by the strategic urban plan. The municipality has secured remaining functions within this zone to prevent pure market-led transformation.

4. The London Industrial Intensification Study

Exploring the feasibility and acceptability of new urban models (Mista Team, 2022)

The innovative idea is that developers can intensify industrial activities, such as vertical stacking, to diversify the zone into mixed-use, rather than single-use zone.

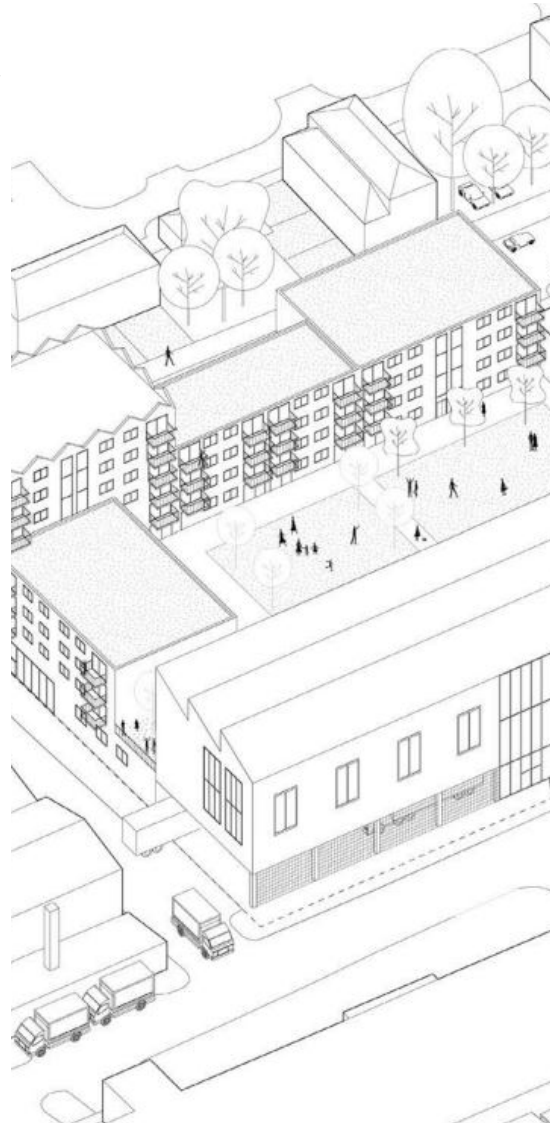


Figure 4.5 Stacked medium industrial with residential; Industrial Intensification (Source: VVE MADE THAT)

Figure 4.7 CityGate II - Small Island (Source: Nora Walter Images for A L'île TM - AHA.EB KSA noA SBa)



6. Citydev.brussels

A publicly owned development agency at the metropolitan level (Mista Team, 2022)

Citydev.brussels is a publicly owned development agency that operates in the urban metropolitan region. It helps drive economic planning and is involved in area development. Apart from providing affordable housing and generating mixed-use zones, it aims to attract and retain industrial activity to companies by offering accessible real estate infrastructure.

5. Masterplan Strijp-S 2002

A strategy to redevelop a former industrial area in a new production hub in Eindhoven (Mista Team, 2022)

A strategy to redevelop a former industrial area as a creative and cultural area. The area hosts a mixed-use program while preserving the industrial heritage.



Figure 4.6 Strijp-S (Source: west8.com)

Figure 4.8 Foodmet Abattoir, Brussels, Belgium, by ORG Architecture (Source: F. Dujardin)



7. Brussels' Abattoir

Old Urban Spaces for the foundational economy (Mista Team, 2022)

Abattoir or a slaughterhouse operating in the 80s in Brussels transformed into a hub hosting different food-related activities.

05

**Industry as a Catalyst
of Urban Changes**

Rijeka



5.1 CASE STUDY – Proposal for Rijeka

5.1.1 Milutin Barač Street, Colloquially Known as Industrial Street: The Backbone of Urban Transformation in the Dormant Western Wing of Rijeka Port

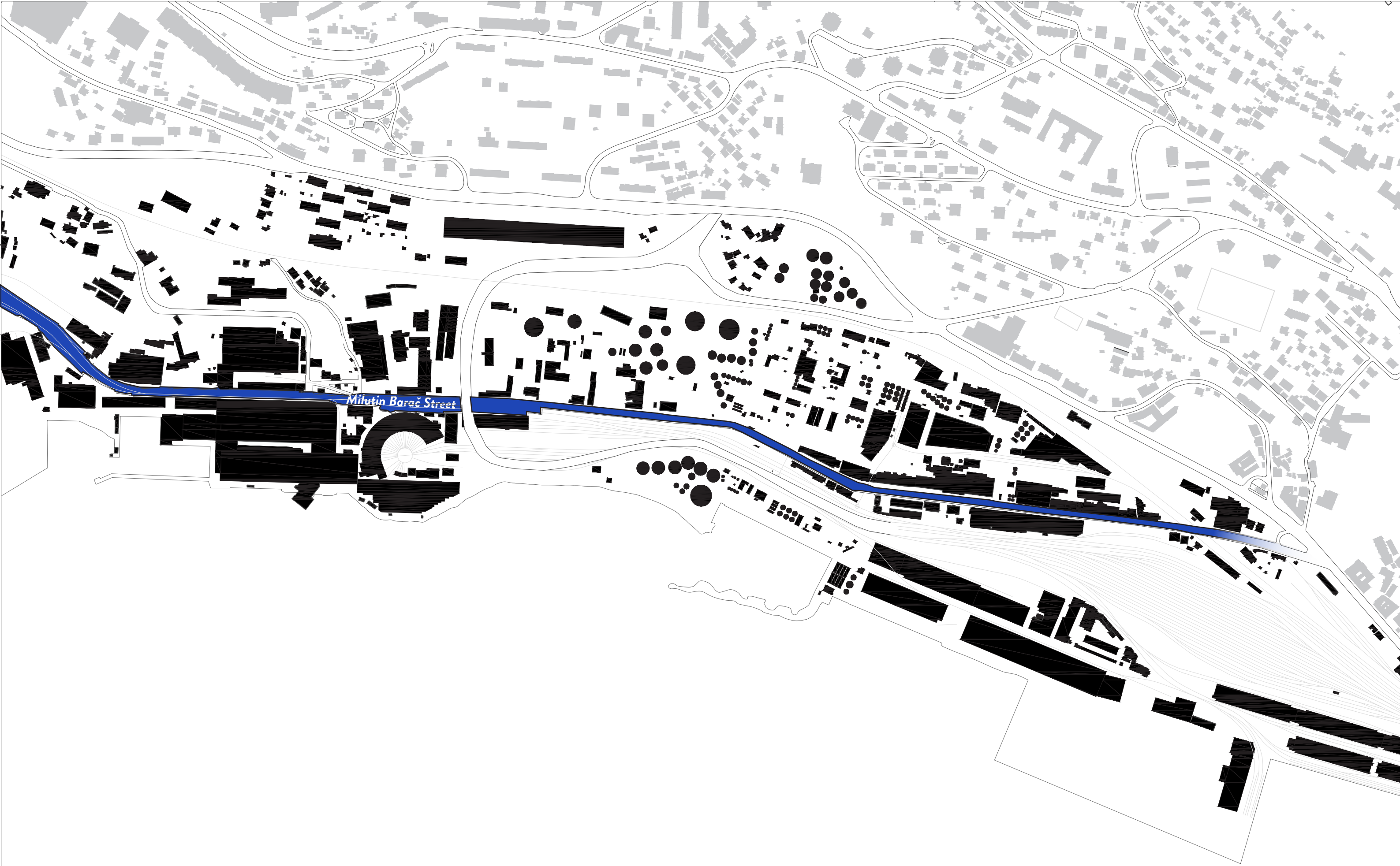
Based on all the above-conducted analysis, the urban intervention zone is limited to the existing Milutin Barač Street, colloquially known as Industrial Street.

The decision to focus on Industrial Street (Milutin Barač Street) stems from several key reasons:

1. The street links to recognized urban plans, making it a vital element for urban revitalization.
2. Despite its current neglect, Croatia's substantial investment in infrastructure (like the D403 road) aims to connect and improve the port, even though urban facilities are somewhat lacking.
3. The street holds historical and industrial importance for Rijeka.
4. Stretching beneath the significant traffic route of Zvonimirova Street, it offers options to alleviate urban traffic.
5. The abandoned oil refinery industry, deemed crucial by the author, poses a threat to the surrounding urban structure due to its vulnerability.
6. Public accessibility.

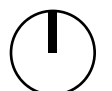
Figure 5.1 The view of the western industrial wing of the city of Rijeka. (Source: Author)





Milutin Barać Street

1:5000



Historical Urban Context

Milutin Barač Street is intrinsically linked to the founding and establishment of the Kerosene Port on the western coast near the Mlaka bay in 1883. This specific locale witnessed a rapid rise under the oversight of Milutin Barač, a seasoned builder and manager of the Oil Refinery. The Rijeka route dedicated to oil transportation received substantial investments and backing from Austro-Hungary, establishing competition for the port in the city of Trieste. In line with the port's development and business opportunities, the development of the tram line (whose tracks are still visible in the Industrial Street) was necessary to connect the western part of the port zone with the city center. This infrastructure was essential for bridging the western segment of the port zone with the city center. The operations of the port and

the trade of raw materials assumed pivotal roles in the broader regional economic landscape. The destruction of the port and the bombing of the Oil Refinery during World War II shaped a new development period for this zone. The Urinj Refinery, constructed during the Yugoslav period, and the Bakar Kerosene Port became the primary station for loading refined products (Đekić, 2001). The decision to gradually shut down the Kerosene Port was primarily influenced by the size of ships (tankers) and environmental concerns. After the dissolution of Yugoslavia, Croatia was the majority owner of the INA oil industry until 2008 when privatization, bribery, corruption, and war profiteering led to INA's downfall, with the majority of shares taken over by the Hungarian group MOL. This transformed the entire zone into Hungarian ownership, neglecting the urban situation and further distancing

the city and its citizens from the coastal area and its redevelopment, considering the hazardous and outdated technology stretching along the entire length of the northern side of the Industrial Street.

Broader Urban Context

The question of development of the Industrial street is the question of urban integration of the entire western wing of Rijeka Port. However, the notable lack of integrative vision for this area, specifically, is evident in the fragmented urban developments and non-linked investment projects. In this context, the focus is still on significant functions like extensive infrastructure and industrial projects. **There is a lack of an integrative vision for establishing a new urban core, such as a mixed-use city quarter or a zone blending residential and working spaces. The scale of development remains large**

following the historical times. The objective of relocating major functions away from the city center and waterfront falls short in the broader context, as it continues to amplify industrial and working activities in the most appealing urban zone.

Generally speaking, there is no appropriate urban vision that could become the catalyst of the general urban transformation for the dormant industrial belt. Following analysis and strategy presents the potential of this urban axis to serve as the backbone and an example for urban transformation. The subsequent analysis and strategy highlight the potential for this urban axis to function as the backbone and an exemplar for urban transformation in ongoing changes.

Broader Urban Context_ western industrial wing



Figure 5.2 The Western Wing of Rijeka
(Source: Google Earth)

- Litoral industrial zones
- ⋯ Old Town Rijeka/downtown



At present, within the urban vicinity of the focused region, several ongoing or initiated projects shape the progressive vision for Industrial Street as the western urban axis:

1. Infrastructure: D403 road

D403 road connects newly established terminal directly to the Škurinje interchange and further integrates it into the European road network. There will be a significant alleviation of

local urban traffic (The City of Rijeka, 2023).

2. Infrastructure: Bus terminal

The bus terminal is the most anticipated project in the city, promised to citizens for the past 20 years. It seems that construction will indeed commence in the second half of 2023 following the conceptual design made back in 2008. It is situated in a part of the Rijeka port that has always been closed to the

public, between the railway station, cargo terminal, and passenger port (3LHD, 2008).

3. Industry & Work: Rijeka Gateway

The Rijeka Gateway will be the most advanced, remotely operated container terminal in this part of Europe. It will serve as the main entry point to the countries and markets of the European hinterland. The Rijeka Gateway is a company jointly owned by APM

Terminals, operating as part of A.P. Moller - Maersk (The City of Rijeka, 2023). The historical port warehouse will be collaboratively repurposed into a parking and office working zone to support the operations of the existing and upgraded container terminal, offering a conducive workspace for approximately 300 workers (Filipović, et al., 2023).

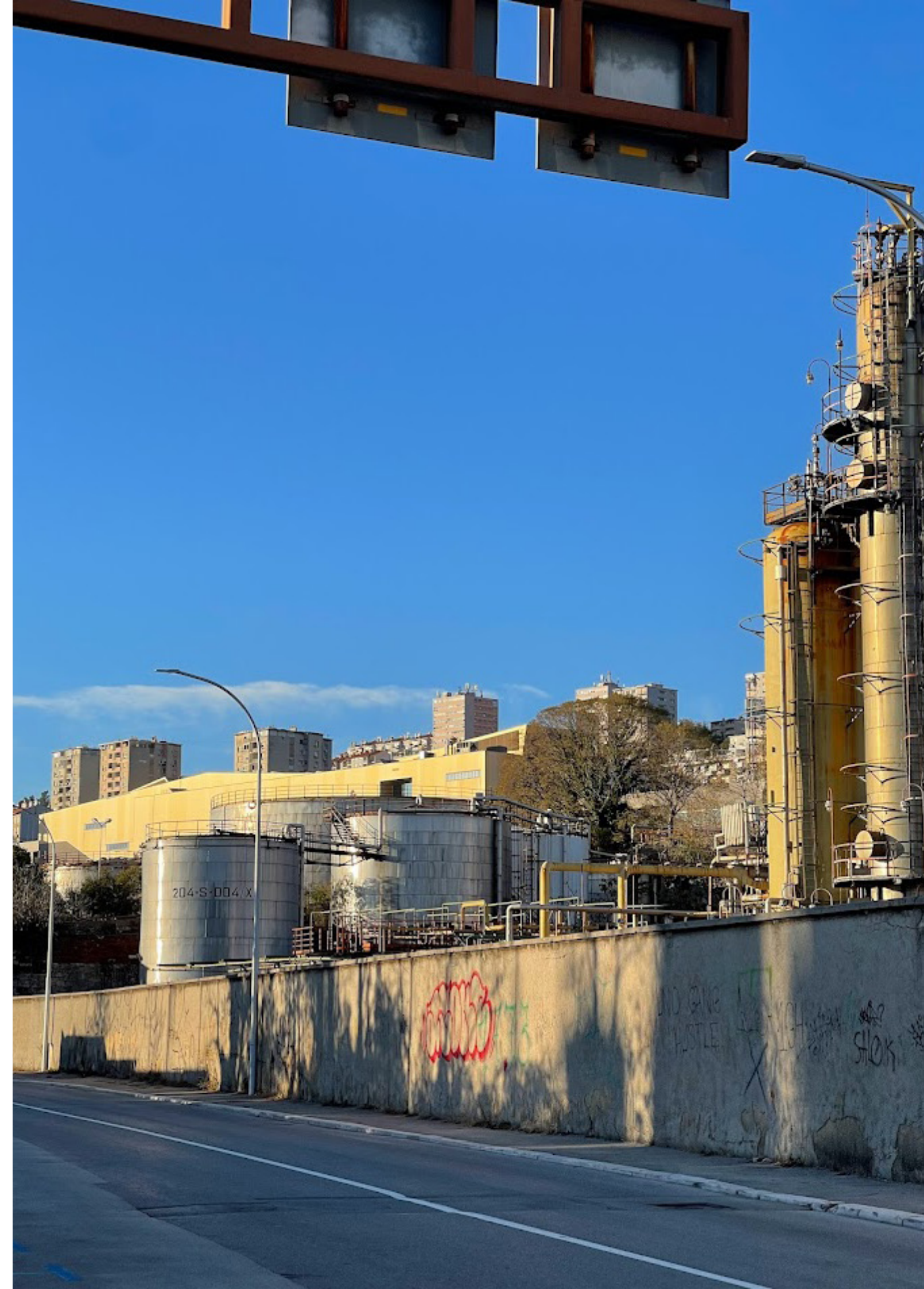
4. Industry: 3 May Shipyard

Narrow Urban Context

The Industrial Street serves not only as the backbone of the dormant western industrial wing but is also designated at two crucial points in the General Urban Plan. First, in Chapter 3, we observe that the ExTorpedo zone is marked as a “City project,” indicating the city’s initiative for changes in that area. However, the ExTorpedo zone has long been a topic of public discussion due to its abandoned state and is recognized as cultural heritage. Nevertheless, it is crucial to emphasize that the revitalization of the entire street is necessary for the functioning and connection of the ExTorpedo zone itself. The second point, as seen in Chapter 3, is that the Industrial Street, in its various fragmented zones, is marked as an “unclear zone” according to the General Urban Plan of the city of Rijeka. However, the city seems

to overlook the quality of the street and its immediate surroundings in the broader context for the significance of the downtown area. Namely, the focused zone is just a 20-minute walk away from the future bus terminal in the city center and a 5-minute drive from the same. The entire area has the potential to become an operational zone in the downtown area and alleviate the downtown.

Figure 5.3 View of the abandoned oil refinery facility from Industrial Street, which is inaccessible to the public. (Source: Author)



Novi Sad



5.2 CASE STUDY - Proposal for Novi Sad

5.2.1 Working zone north III, Port of Novi Sad

After extensive research conducted in the previous chapters, the urban intervention for the case of Novi Sad will be situated at the location of the Novi Sad port. There are several reasons support this choice.

1. Due to the ongoing zoning policies in the urban development planning of the city, this area has become an isolated island without integration into the urban structure. This presents a unique opportunity for intervention, as revitalizing such isolated pockets can contribute to a more cohesive and integrated urban landscape.

2. The location is in close proximity to the city center and has the potential to become its new integral part. By situating the intervention in this area, it has the potential to seamlessly blend with the existing urban fabric, enhancing accessibility and fostering a sense of connectedness. This integration with the city center not only ensures the project's viability but also positions it as an integral component of Novi Sad's evolving urban identity.

3. The site is attractive and publicly accessible.

4. The port is positioned at the TEN-T Rhine-Danube Corridor (formerly Pan-European Corridor VII) and the former Pan-European Corridor X, projected to be a part of the TEN-T Orient/East-Med Corridor. Being part of the projected TEN-T Orient/East-Med Corridor further underscores the location's importance in regional and transcontinental transportation networks.

5. In light of these considerations, it is imperative to bring such locations to the attention of governmental authorities.

NOVI SAD

NOVI SAD

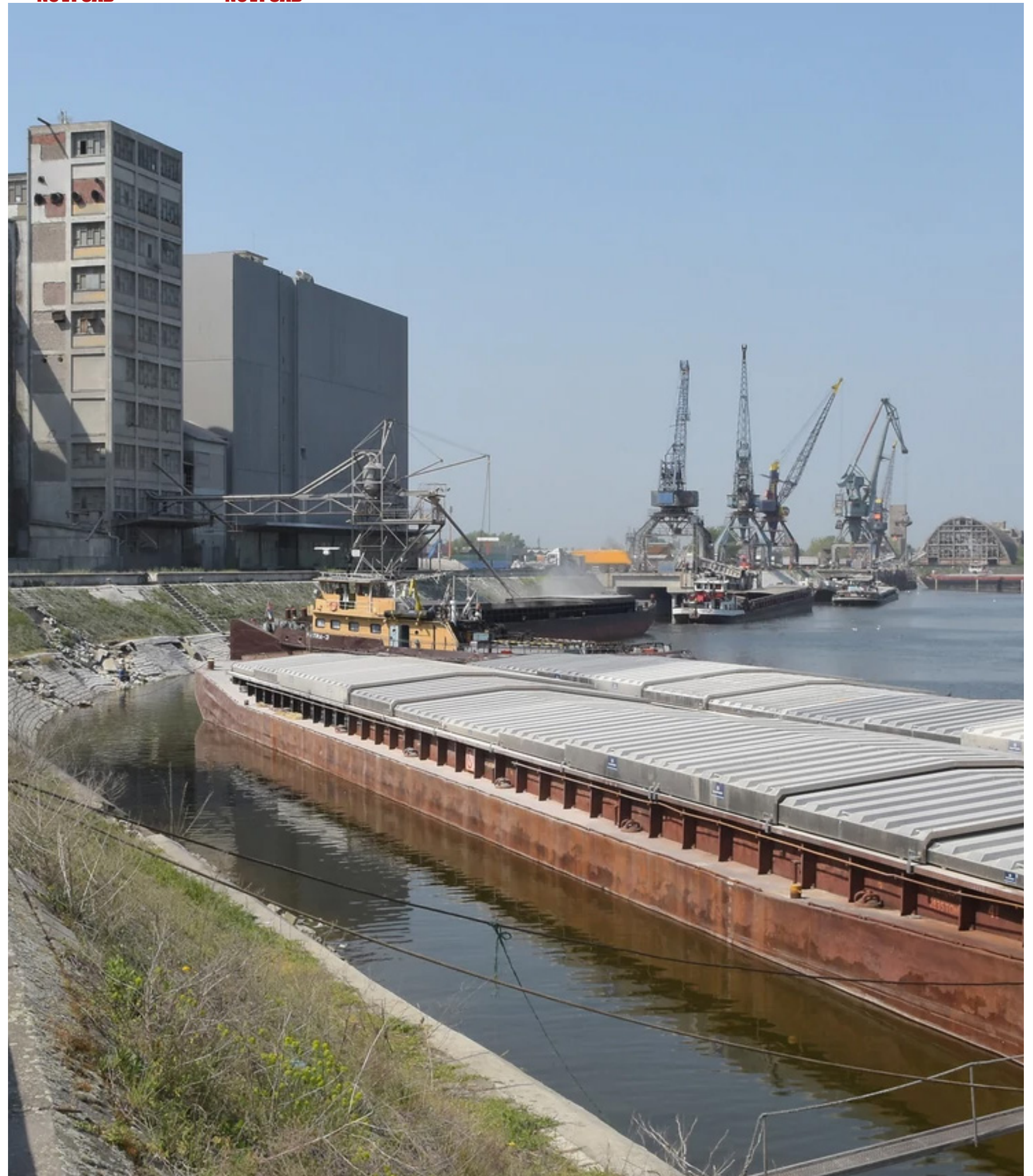


Figure 5.4 View of the Port of Novi Sad (Source: N.Milojevic)



WORKING ZONE NORTH III

CITY CENTER



Historical Urban Context

Since July 1957, based on the decision of the city authorities in Novi Sad, the enterprise operated under the new name of Novi Sad Ports and Warehouses. In 1959, the Government of the People's Republic of Serbia decided to finance the construction of a cargo port in Novi Sad on the right bank of the Danube-Tisa-Danube canal, with the canal's section near its meeting point with the Danube being deepened. The port is still located at this site today.

In 1962, the Novi Sad City Assembly adopted a new General Urban Plan, designating land between the Danube-Tisa-Danube canal and the new railway line south of the canal for the cargo port. In 1963, the city authorities allocated 45 hectares of land for the construction of the port and warehouses on the designated location. The land was filled with around 3 million cubic meters of sand between 1963 and 1973 to prepare it for the new port. Between 1959 and 1969, the Novi Sad Ports and Warehouses operated independently, completing major projects, constructing operational shores, installing paths for cranes, and mounting three portal cranes with a capacity of 5 tons each. Warehouses were not built due to financial constraints resulting from repaying loans for completed facilities. In the

context of a centrally planned socialist economy, the enterprise integrated into the financially stronger "Heraj Pinki" company. From 1969 to 1983, the integrated enterprise finished embanking and leveling the port's operational area, constructed closed warehouses, roads, railway tracks, water supply, and sewage systems. In 1983, the city authorities decided to separate the port and public warehouses from the "Heraj Pinki" company, establishing a new enterprise named Luka Novi Sad. Since then, Luka Novi Sad has operated as an independent entity. In 1984, the Federal Executive Council of the Socialist Federal Republic of Yugoslavia declared Luka Novi Sad an international port.

In the 1960s, the industrial zone of Novi Sad was relocated to the northern suburbs, resulting in numerous industrial and trading companies having warehouses in the proximity of the port. Silos for grain and a warehouse for artificial fertilizer were built on the western bank of the canal, while warehouses for oil and oil derivatives were constructed on the eastern bank, connected to an oil refinery nearby. During the 1980s, the annual traffic of Luka Novi Sad reached approximately one million tons, with 0.6 million tons dedicated to oil and its derivatives, and 0.3 million tons for international traffic. (Kristijan Obsut, 2019.)

After the dissolution of socialist Yugoslavia and a three-year transit ban through Serbia due to UN sanctions, Luka Novi Sad continued to operate successfully. The waterway on the Danube to Black Sea ports became the most favorable transportation route from Serbia.

On May 10, 2019, in the privatization process of social property in the Republic of Serbia, Luka Novi Sad was acquired by the company "P&O Port Dubai" from the United Arab Emirates, operating under the umbrella of the "DP World" company, the third-largest port operator globally. (Kristijan Obsut, 2019.)

Broader Urban Context

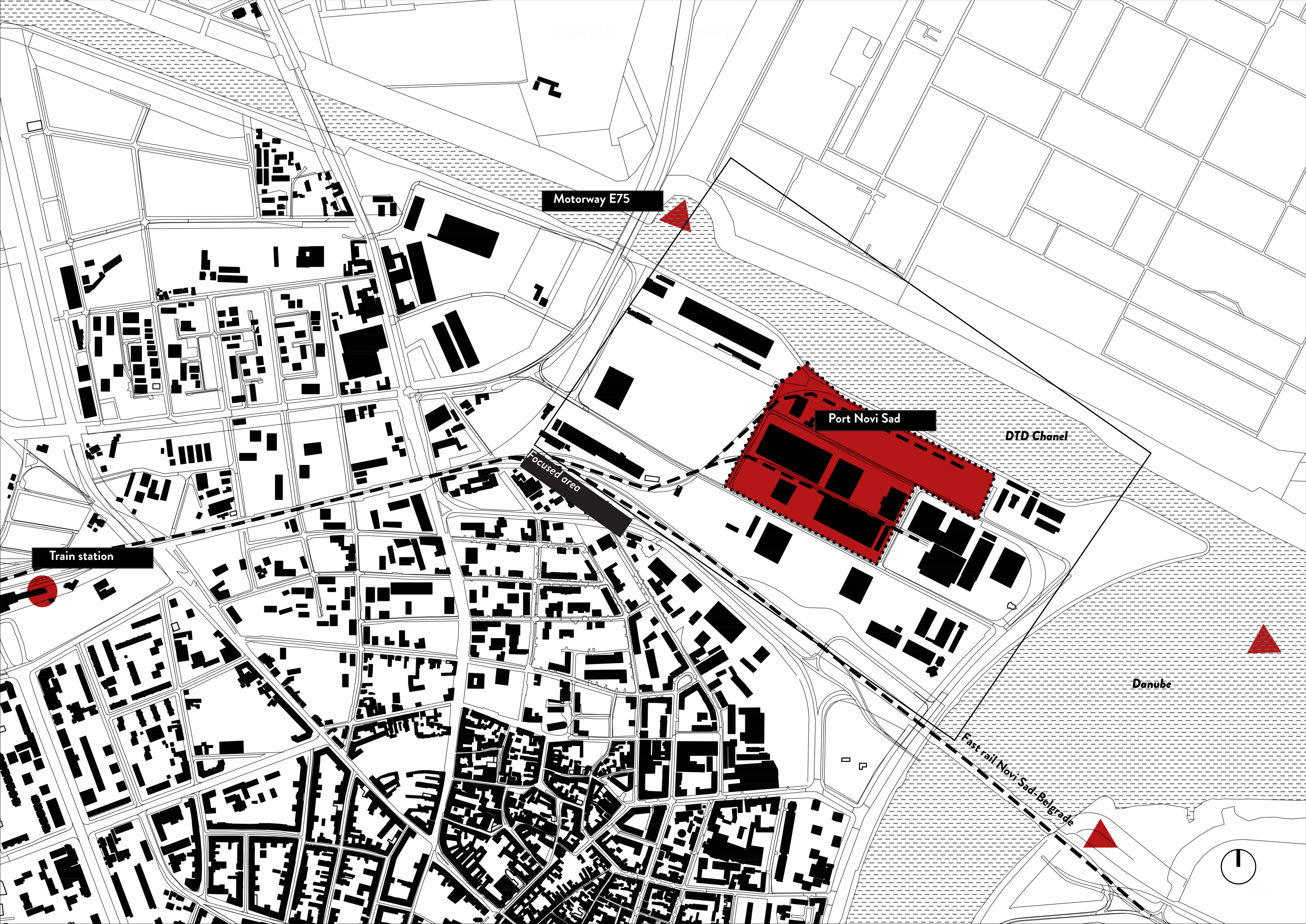
Similar to the situation observed in Rijeka, the city of Novi Sad lacks a comprehensive vision for the incorporation of its industrial zone as an integral component of the urban fabric. Specifically, the Industrial Zone North, encompassing the Port of Novi Sad, lacks a well-defined trajectory for progress and development. The research conducted by the University of Novi Sad primarily focuses on this zone concerning the enhancement of export-import dynamics and the establishment of a new terminal.

To facilitate the long-term development of the Port of Novi Sad, the following strategic points are proposed: immediate development within the

existing location, transforming it into a logistics center; and prospective long-term development towards an "Asia logistics center." This imagines the relocation of all bulk cargo (including silos) and "dirty goods" to a new location. Simultaneously, the location, would witness the construction of warehouses accompanied by additional logistical services. (Nenad Zrnić, 2019) It is crucial to underscore that the continuation of the current trend marked by uncoordinated investments may significantly worsen the isolation of this zone, continuing the expansion of the industrial belt.

Numerous investments have played a pivotal role in enhancing the appeal of industrial zones in Novi Sad. Infrastructure developments, such as the inauguration and operationalization of the Žeželjev Bridge in 2018, have significantly contributed to connectivity, particularly by linking the Industrial Zone North to surrounding areas

Additionally, notable improvements in the transportation network have been realized through the construction of an expedited railway line connecting Belgrade to Novi Sad. This initiative, completed as part of a broader infrastructure project, has not only facilitated the efficient movement of goods but has also streamlined the transportation of workers within the industrial zones.



Motorway E75

Train station

Port Novi Sad

DTD Chanel

focused area

Danube

Fast rail Novi Sad-Belgrade



Narrow Urban Context

The Novi Sad port, currently stands as an isolated enclave due to zoning policies. Addressing this isolation through urban development can contribute to a more cohesive and integrated urban landscape.

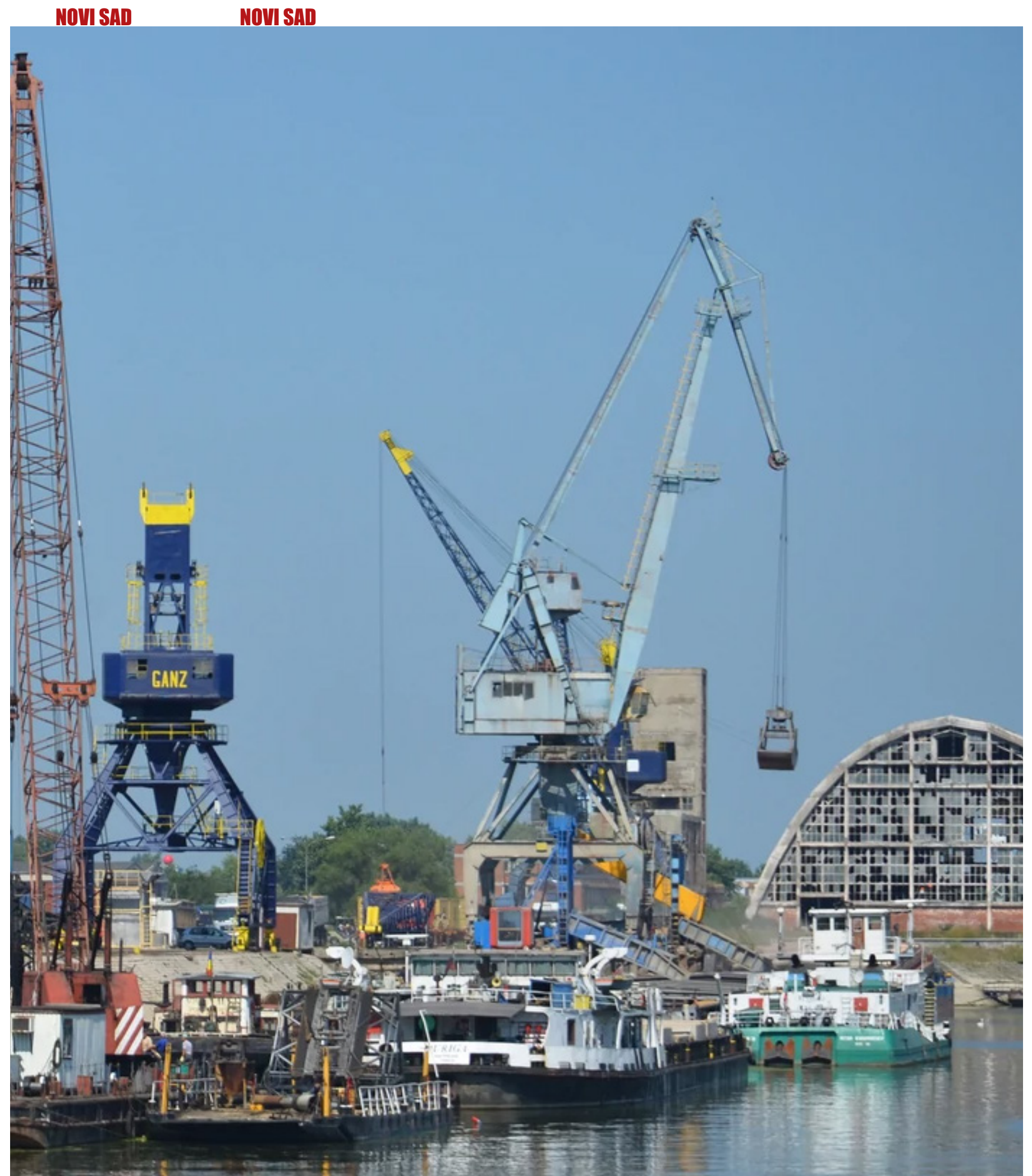
The strategic proximity of the location to the city center offers an opportunity for seamless integration into the existing urban fabric, enhancing accessibility and fostering a connected urban identity. The attractiveness and public accessibility of the site further underscore its potential as a focal point for urban development, attracting residents and businesses.

The port's strategic position within transportation corridors highlights its crucial role in regional and transcontinental networks, enhancing economic potential and contributing to broader European connectivity. The historical context, dating back to the 1950s, underscores the economic legacy of the port, emphasizing

the importance of preserving and optimizing this valuable asset for future growth.

Addressing the current trend of uncoordinated investments is crucial to prevent further isolation of the industrial zone and the expansion of the industrial belt. Strategic and well-planned interventions in Luka Novi Sad, coupled with harnessing the potential of the growing IT sector, can serve as a model for mitigating these challenges and promoting balanced and forward-looking urban development.

Figure 5.5 View of the Port of Novi Sad (Source: N.Mihaljovic)

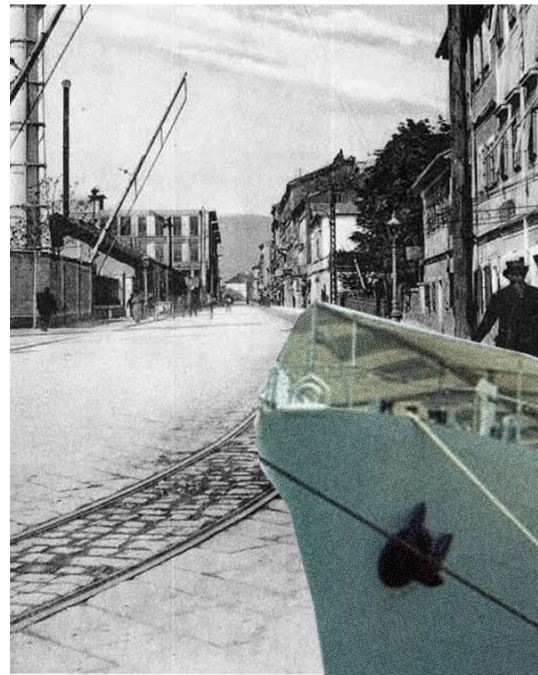
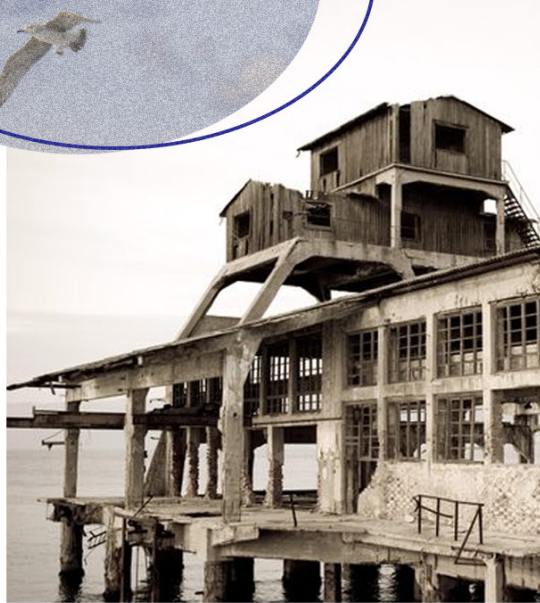


Rijeka

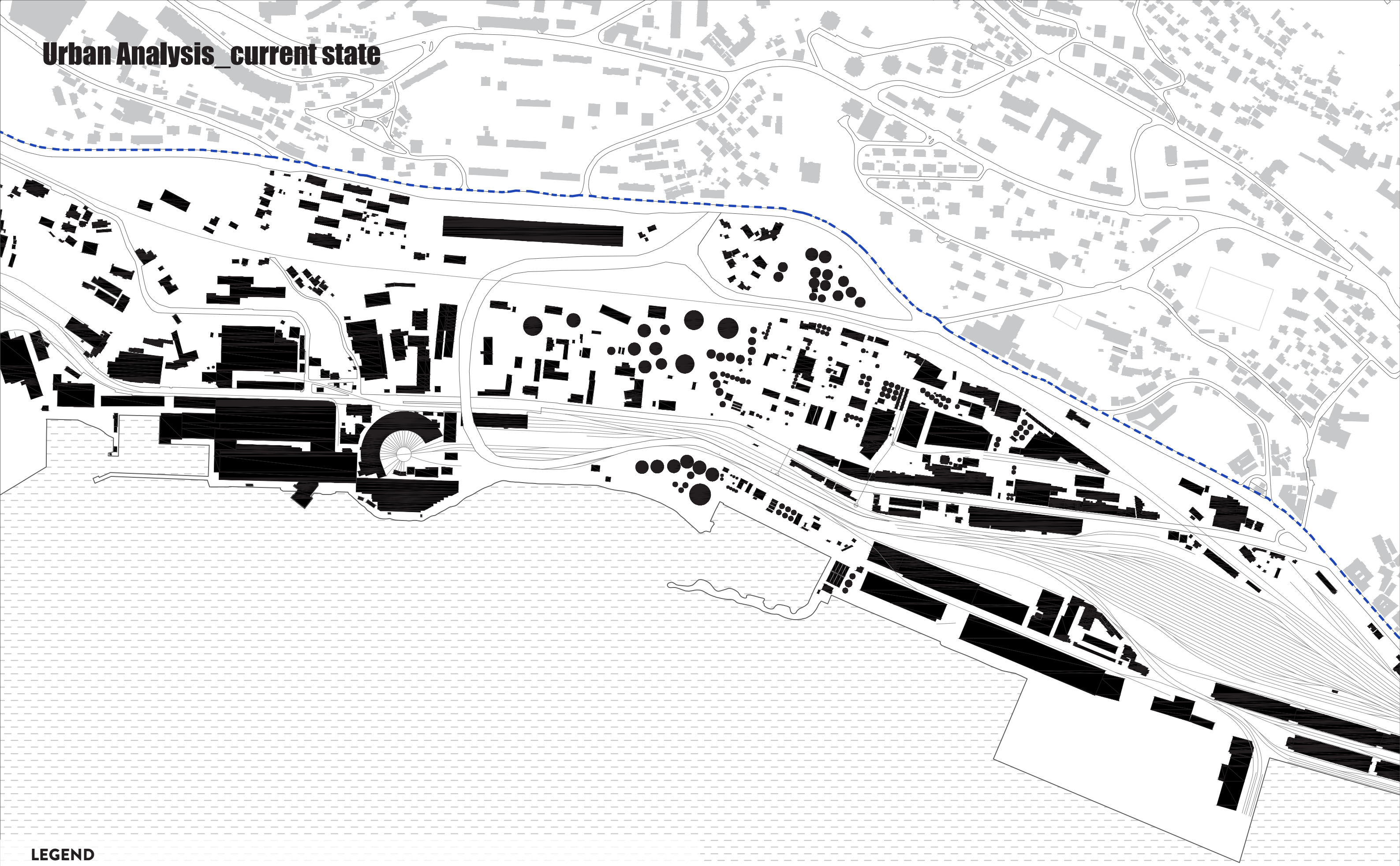


5.3 URBAN ANALYSIS – Rijeka





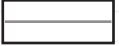
Urban Analysis_vision



Urban Analysis_current state



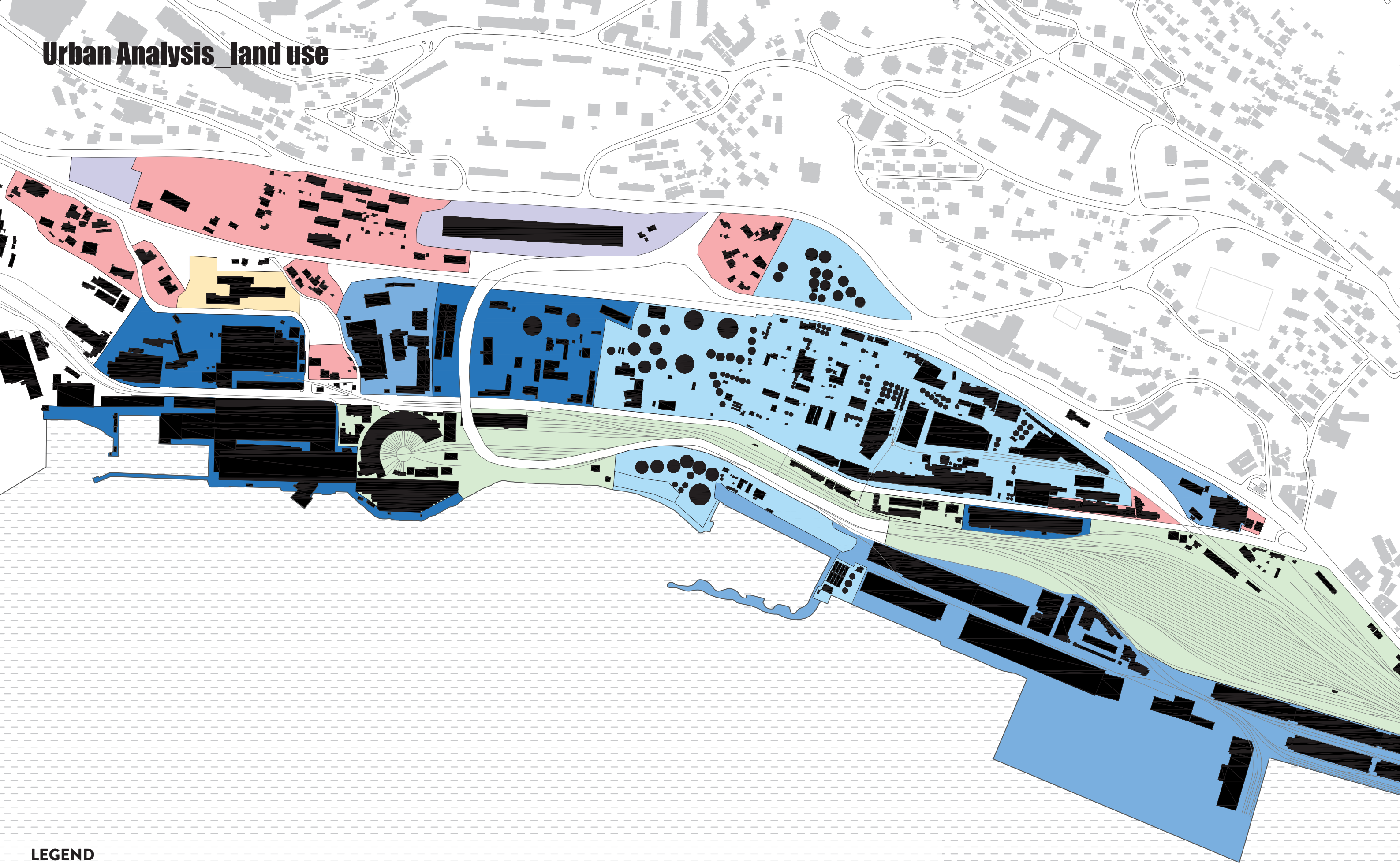
LEGEND

-  Unbuilt
-  Built | Area of intervention
-  Built
-  Area of intervention
-  Rail











1:5000



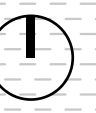
Urban Analysis_land use



LEGEND

- | | | | | | | | |
|--|------------------------------|---|--------------------------|--|-------------------|---|------------------------|
|  | Unbuilt |  | Economic-Industrial Zone |  | Croatian Railways |  | Public and Social Zone |
|  | Built Area of intervention |  | Port of Rijeka |  | Residential Zone | | |
|  | Built |  | INA Oil Refinery |  | Commercial | | |

1:5000



AREA 1 Ex Torpedo Zone | Economic - Industrial Zone | 41k m²



Function, physical conditions

The Ex Torpedo Zone, a former industrial area, now features a mix of private ownership. Although with potential, the area remains underutilized, primarily comprising

Land owner groups

Torpedo Engine Factory owns not only the buildings but also the marina, waterfront area, and breakwater. The railway support

Main local stakeholders

The Torpedo Engine Factory, once a prominent landowner, currently remains inactive and non-operational. It stands dormant, gradually deteriorating, with its

Particularity

The city residents strongly associate with the history of the torpedo and take pride in it. Consequently, there have been numerous initiatives aimed at preserving its legacy within the urban fabric, such as establishing

large warehouse spaces once integral to a former Torpedo factory. Additionally, there is an abandoned launching ramp, posing a safety hazard to the public. The marina and warehouses are currently utilized for dry docking small boats. No current residents.

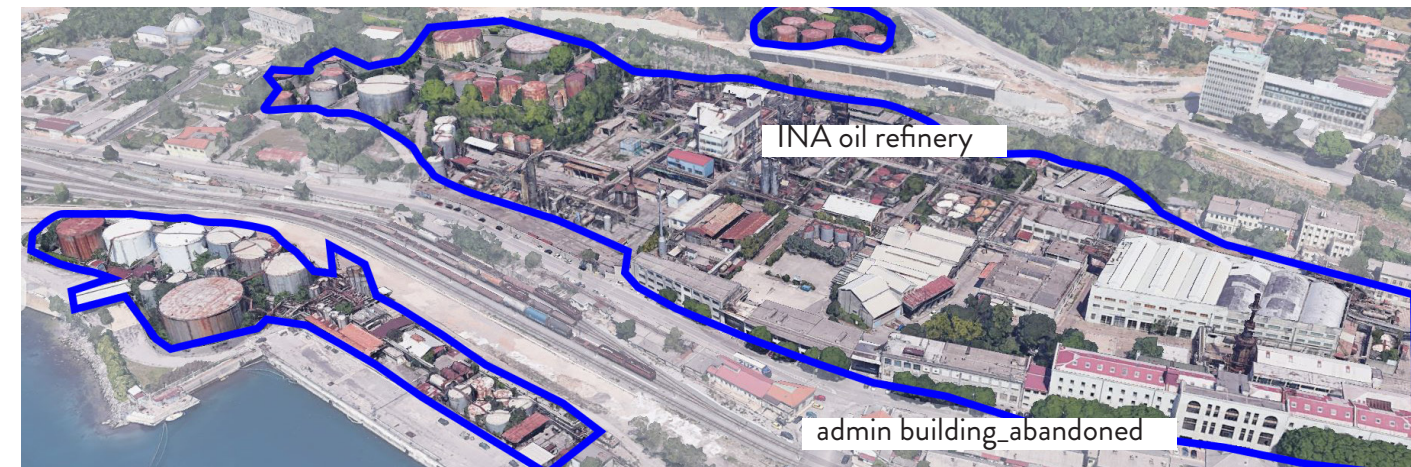
building is owned by Croatian Railways, while Port Authority manages smaller functions.

premises utilized by private boat owners and some smaller businesses occupying the former factory spaces. The city authorities, in conjunction with local scholars, express interest in granting it heritage status.

a start-up hub in the former torpedo buildings, creating a torpedo museum, and granting it cultural heritage status. As a result, it represents a highly valuable site for comprehensive redevelopment into a public amenity.

Urban Analysis _breaking up the area

AREA 2 INA Oil Refinery | Industrial Zone | 170k m²



Function, physical conditions

The INA Oil Refinery zone holds significant importance in the chosen urban area due to its potential hazards to the city. It was formerly utilized for heavy industry and is now fully

Land owner groups

The bulk of the land is controlled by the private Hungarian capital investor MOL. Over the decades, it appears that the owner

Main local stakeholders

MOL Group, based in Budapest, Hungary, is a prominent global player in the oil and gas industry. Presently, it holds exclusive ownership in the selected area.

Particularity

The area formerly occupied by the oil refinery is arguably the most crucial site for rapid redevelopment to address the hazardous and

owned by the Hungarian company MOL, acquired through questionable government transactions for a nominal sum. Access to the area is restricted, and it consists of oil tanks, warehouses, and abandoned administrative buildings.

has shown little interest in maintaining or ensuring the safety of this strategic property.

outdated equipment. Multiple stakeholders will need to collaborate in safely removing the remnants of heavy industry.

AREA 3 Mixed Economic-Industrial Zone | 31,900 m²



Function, physical conditions

The area is experiencing a shift from being entirely industrial to becoming a fragmented economic-industrial zone. This transformation has occurred somewhat organically, with private owners purchasing

Land owner groups

The majority of land in this area is owned by large private capital groups that play a significant role in the overall functioning of

Main local stakeholders

The largest holdings in this zone are owned by the company Energo d.d. It engages in the production, distribution, and sale of electrical energy. It also provides maintenance services

Particularity

This zone should be encouraged to continue its progressive operations as it provides the city with important resources. However,

land and initiating redevelopment projects. Some of the major players in energy and raw material processing are located in this zone. Despite its potential, the area remains underutilized, marked by uneven distribution of land and substandard industrial infrastructure.

the city of Rijeka. However, it seems that the program and functions are still mixed on the micro level in these sites (e.g. the dry docking of boats is present on the land of Metis, the most important urban waste processor)

for energy facilities and equipment. Energo d.d. plays an important role in ensuring energy stability and supply in the Rijeka region and beyond. Another important stakeholder is the company Metis, the leading urban waste processor.

urban policy should aim to control the expansion of these stakeholders by keeping administrative units within the city and relocating larger functions to the periphery.

AREA 4 Port of Rijeka and Croatian Railway Zone | 257k m²



Function, physical conditions

The Port of Rijeka operates as a free trade zone inaccessible to citizens. The majority of ownership is held by the Republic of Croatia and the port authority. The same ownership

Land owner groups

The majority of land in this area is owned by the state. However, recent private investment has catalyzed action, particularly in the

Main local stakeholders

In this case it is the national government together with bigger private capital investor.

Particularity

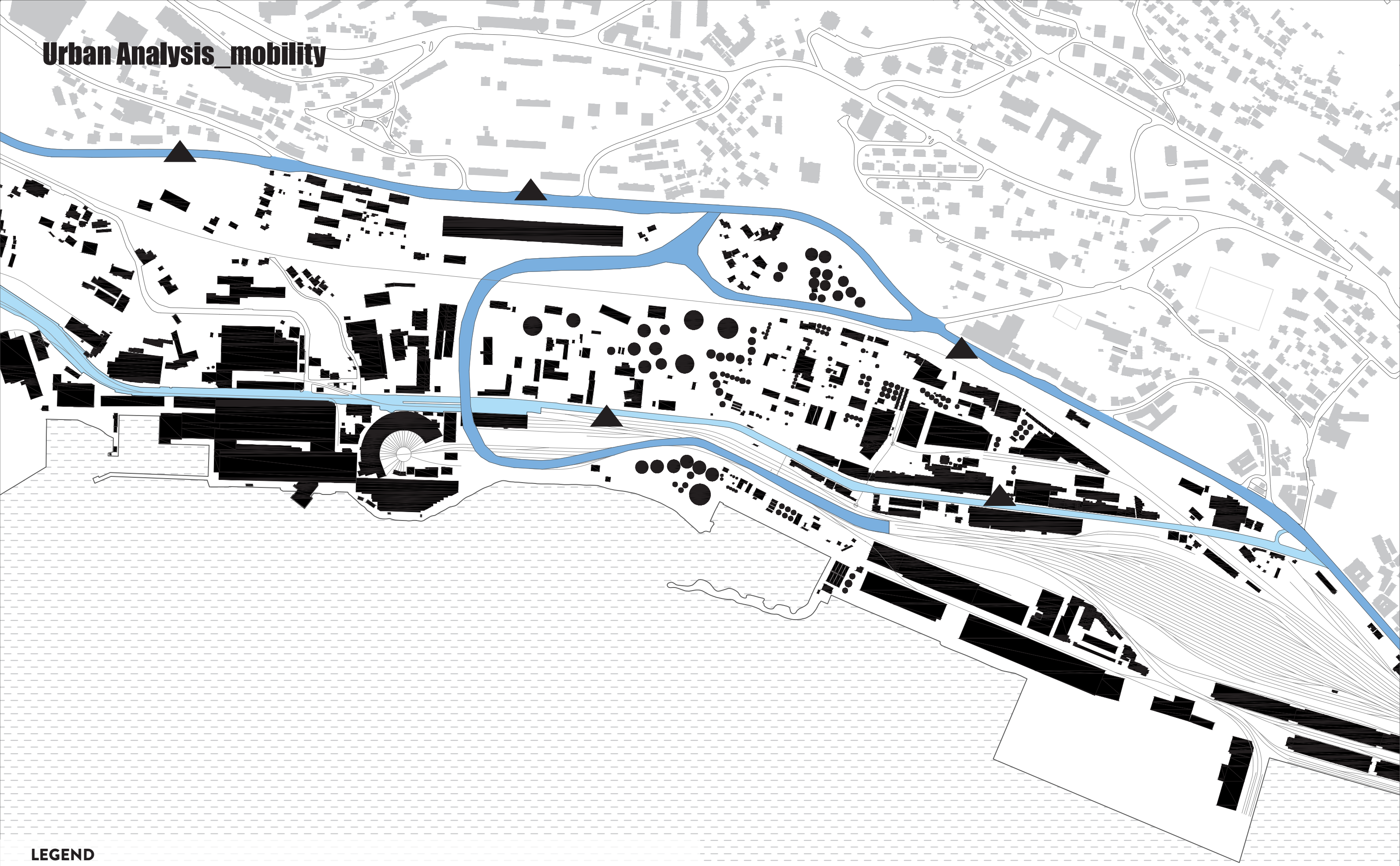
Area 4 presents the greatest challenge for transformation, given the intricate interplay between national interests and

structure applies to Croatian Railways. These zones share similar characteristics: they are not modernized, fenced off from other areas, and accommodate large-scale functions.








privatization of part of the dock to establish the Rijeka Gateway container terminal, backed by Maersk.

local governance. The port warehouses enjoy heritage status, making it challenging to align their extensive operations with the evolving demands of collaborative work processes in the current market.

Urban Analysis_mobility



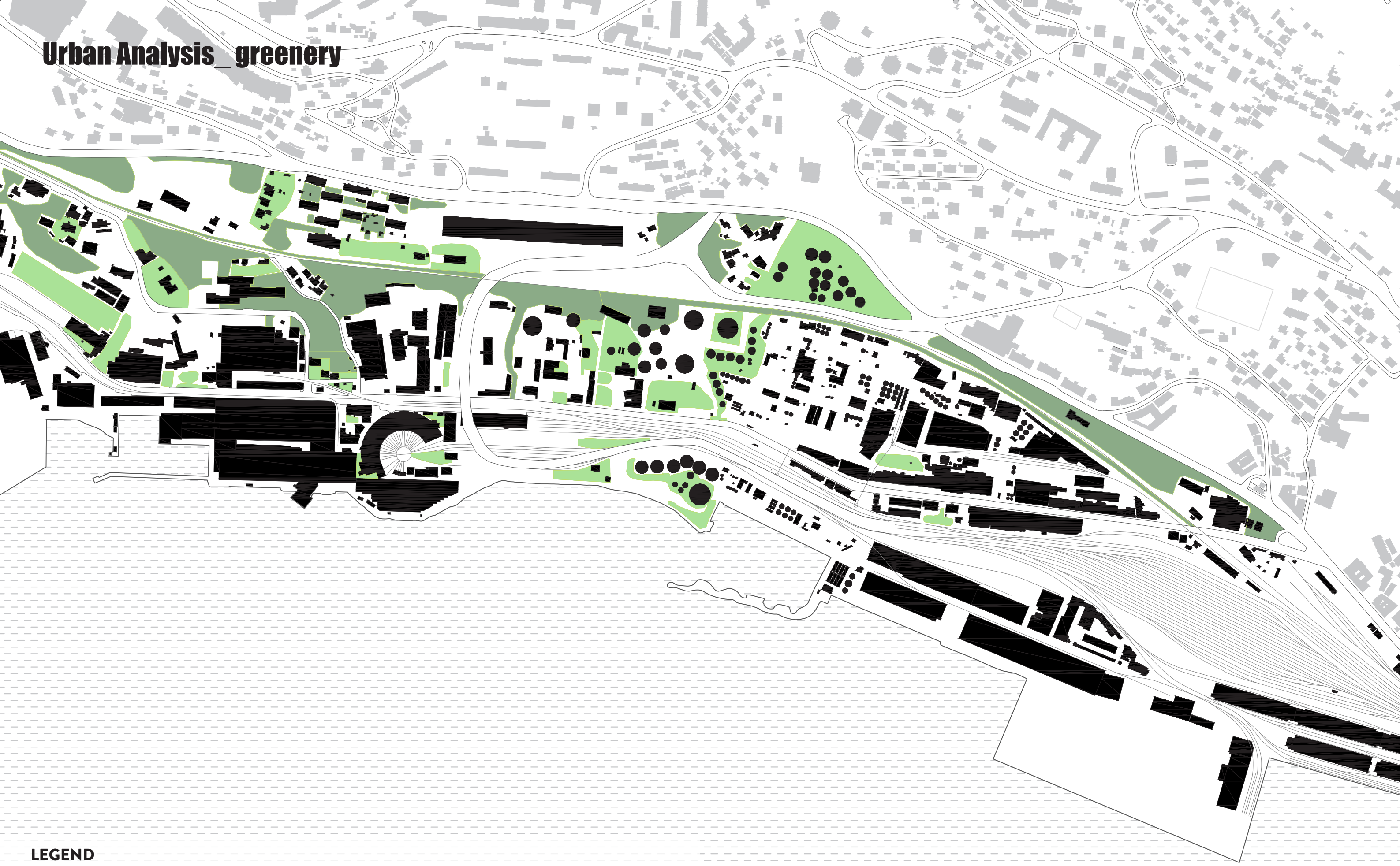
LEGEND

- | | | | | | |
|--|------------------------------|---|----------------|---|-------------|
|  | Unbuilt |  | Primary road |  | Bus Station |
|  | Built Area of intervention |  | Secondary road | | |
|  | Built |  | Rail | | |

1:5000



Urban Analysis_greenery

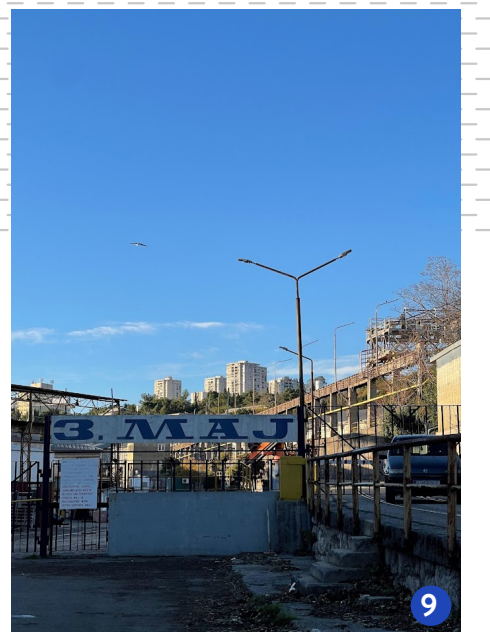
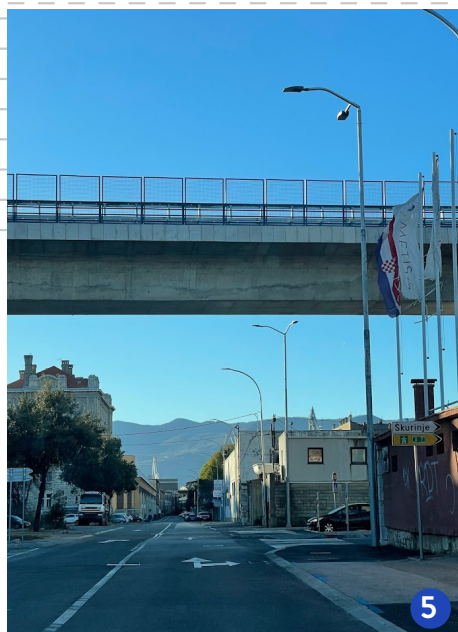


LEGEND

-  Unbuilt
-  Built
-  Private greenery
-  Public greenery

1:5000



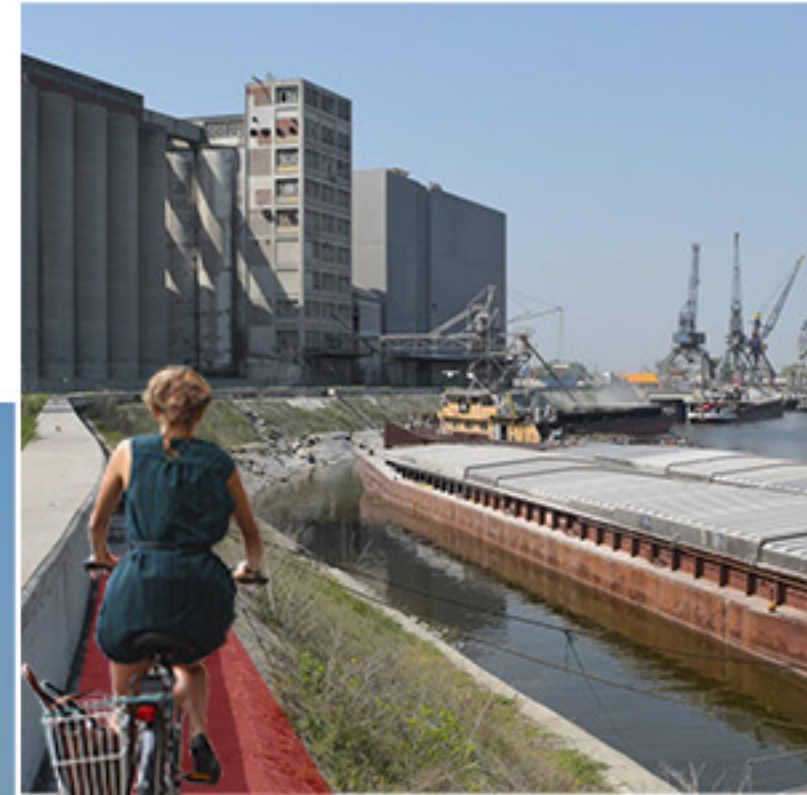
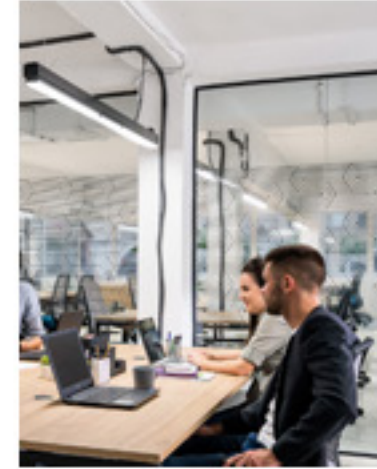


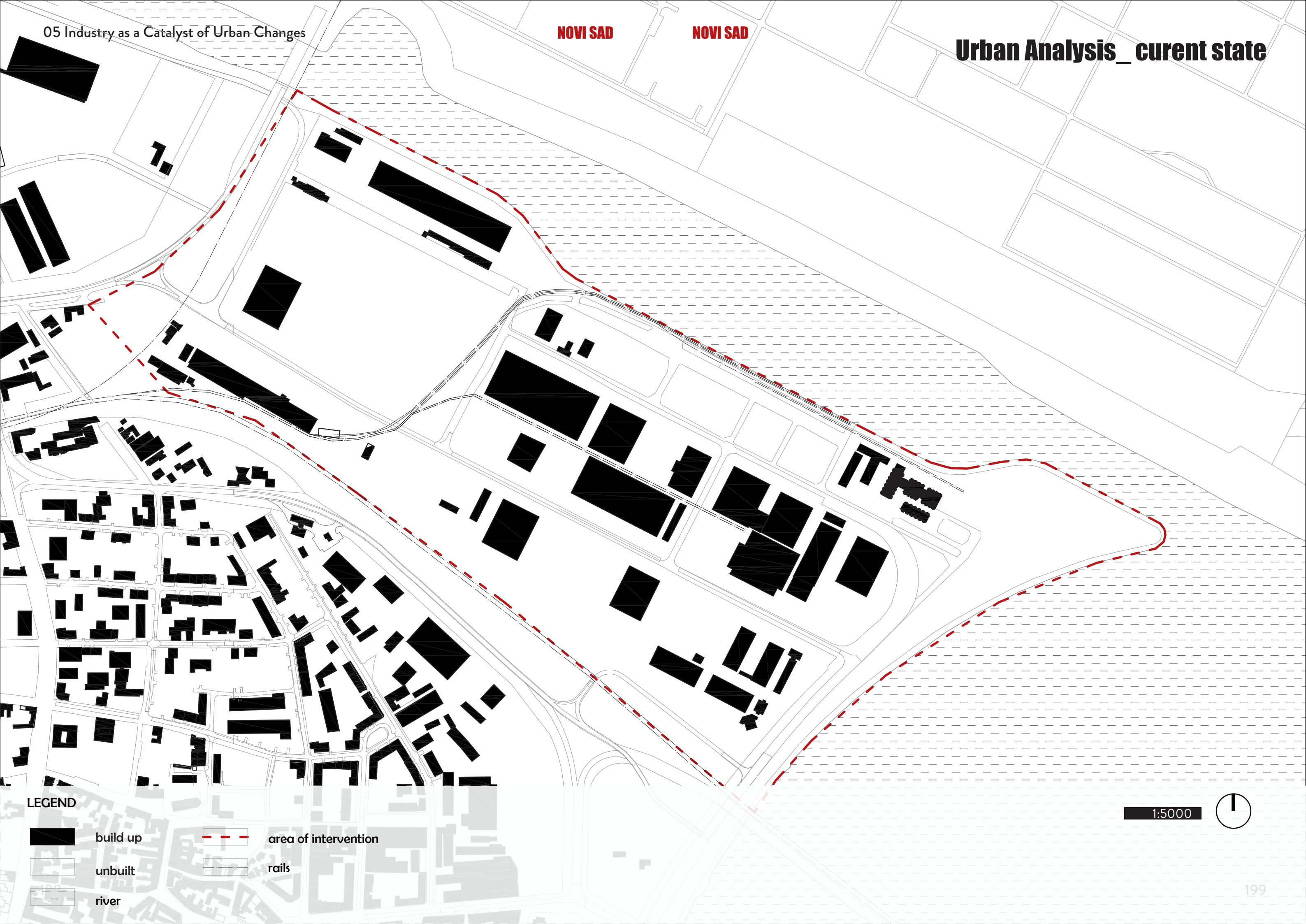
Novi Sad



5.5 URBAN ANALYSIS – Novi Sad

Urban Analysis_vision





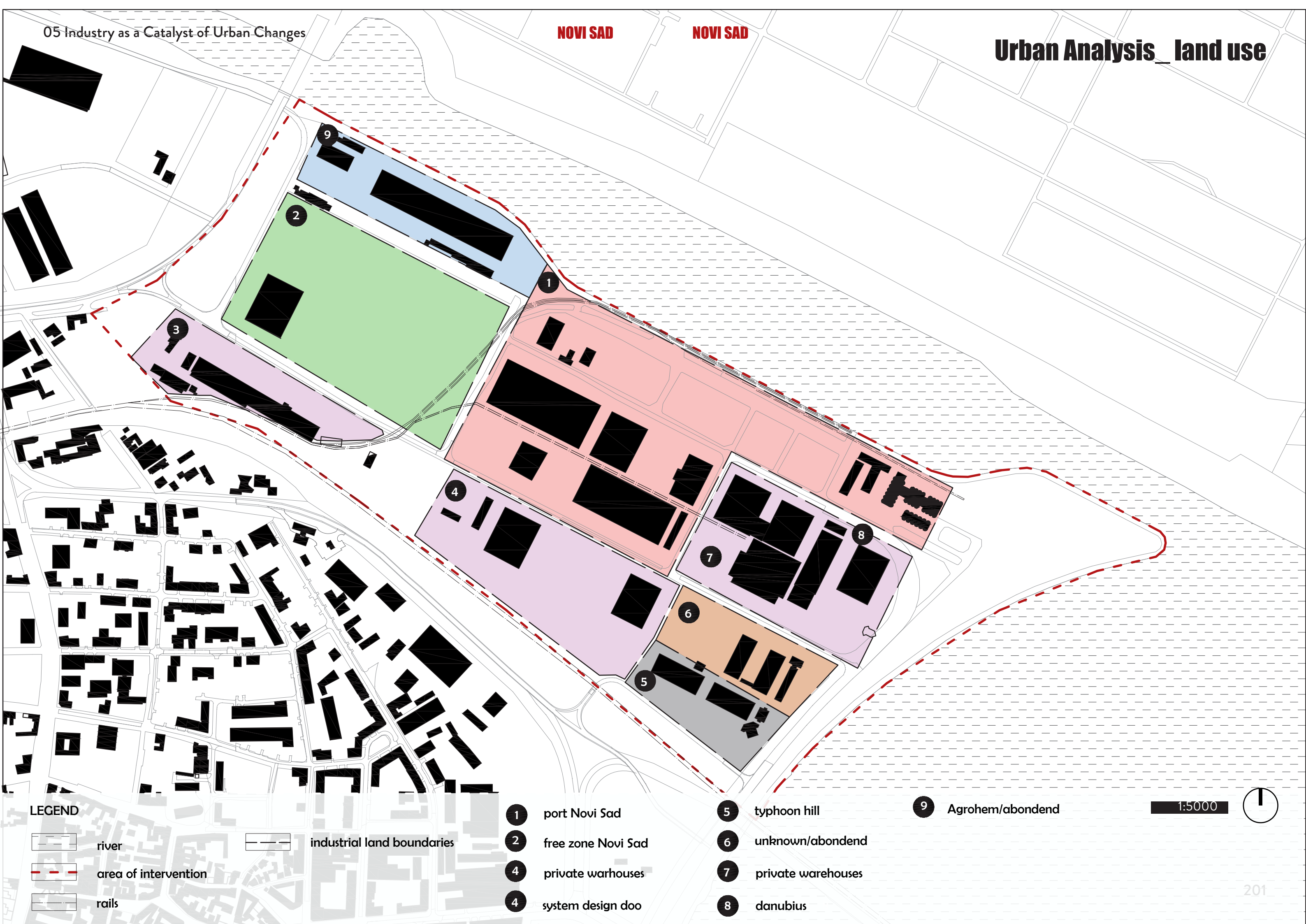
LEGEND

- build up
- unbuilt
- river

- area of intervention
- rails

1:5000





LEGEND

-  river
-  area of intervention
-  rails
-  industrial land boundaries

- 1** port Novi Sad
- 2** free zone Novi Sad
- 4** private warehouses
- 4** system design doo
- 5** typhoon hill
- 6** unknown/abondend
- 7** private warehouses
- 8** danubius
- 9** Agrohem/abondend

1:5000 

AREA 1

AGROGEM_40.700m2
FREE ZONE NOVI SAD_98.400m2



Function,physical conditions

Agrohem, formerly a successful company in chemical production, is now in bankruptcy and decline. The facility is engaged for demolition and is in poor condition. Despite its

Land owner group

Agrohem is owned by “Limited Liability Company Agrohem Export Import - in liquidation,” while the facility has

Main local stakeholders

Agrohem is under the ownership of the Liquidation Administrator, and the

Particularity

The space lacks definition and proper organization. Before any action can be taken, it’s crucial to resolve property and legal matters concerning Agrohem. Additionally, the Free Zone should

architectural value and interesting waterfront location, it is deteriorating. The Free Zone Novi Sad offers stimulations for investors who choose to develop within this area. However, despite this, the location fails to attract investors.

been in the liquidation process since 2001. Within this Free Zone location, there is a technical inspection center for vehicles, but part of the plot is neglected and unmaintained.

liquidation process is stagnant due to severe financial constraints, leaving its future uncertain. The Free Zone is owned by the Republic of Serbia.

reconsider its policies and open up the land for alternative uses. The area has the potential to acquire a new identity by introducing new functions such as sports and recreation or residential purposes.

Urban Analysis_ BREAKING UP THE AREA

AREA 2

DANUBIUS_PRIVATE WAREHOUSES_65400m2
TYPONHILL_24200m2
UNKNOWN_ABONDEND_27600m2



Function,physical conditions

Danubius and Typonhill are successful companies in Novi Sad. Danubius is engaged in the food industry, while Typonhill specializes in electronic and

Land owner group

In this area, private owners play a dominant role and operate successfully.

Main local stakeholders

Owners of Mikromarket and Univerexport are important suppliers for the citizens of Novi Sad, owning numerous stores and facilities in the

Particularity

This area is characterized by the dominance of successful private investors who should be encouraged to

hardware manufacturing. Within the private warehouses, there are storage facilities for large supermarkets such as Univerexport and Mikromarket. Information about the abandoned facility between them is unclear.

city. Danubius has a long history of pasta production and has been located in this area since its inception. Typonhill is a promising foreign company engaged in hardware and software production and development.

collaborate to give this zone a new, clear identity beyond industrial purposes. Introducing residential areas would diversify this region and contribute to its revitalization.

AREA 3

PORT NOVI SAD_140.00m2



Function,physical conditions

The Port of Novi Sad was privatized in 2019 and is now owned by P&O Ports FZE, managed by DP World

Land owner group

P&O Ports FZE is a specialized company that operates small,

Particularity

Expansion of the port’s capacity is planned by 2025. This planned and strategic expansion could benefit both the city’s residents and the port’s owner. Exploring the release of the coastal

from the United Arab Emirates. The port currently consists of 100,000m2 of space with both open and closed warehouses. The warehouses are poorly maintained and neglected, while the machinery is outdated.

multipurpose ports, including container terminals, bulk terminals, and general cargo terminals.

strip and establishing a promenade zone should be part of the plan. Expansion of the port to the supporting shore of the canal, where an abandoned oil refinery is located should be considered.

AREA 3

SYSTEM DESIGN DOO_PRIVATE WAREHOUSES_85.000m2



Function,physical conditions

System Design is a factory specializing in the production of transport cases. Within this area, there are also

Land owner group

Landowners engage in various forms of trade: Pak System, Metalac, Cvrle doo,

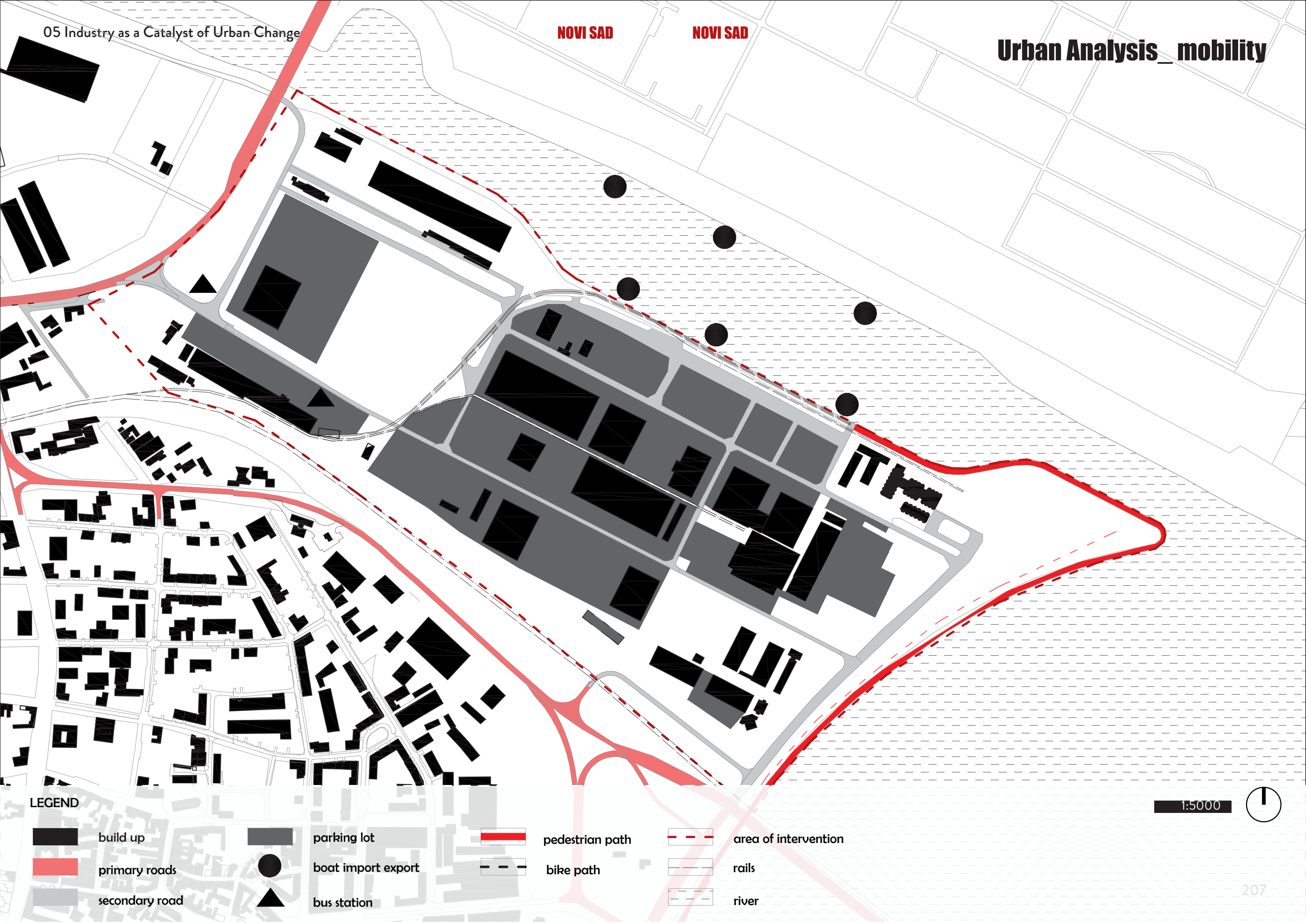
Particularity

Encouraging owners to reorganize warehouse space to free up areas for introducing new mixed functions.

warehouses belonging to Pak System, Metalac, Cvrle doo, and MasterCar. The warehouses are newly constructed, while open space has been converted into parking lots and outdoor storage areas.

and MasterCar.

Researching ways to foster collaboration among stakeholders. Planning for social housing in the freed-up areas.



LEGEND



build up



parking lot



pedestrian path



area of intervention



primary roads



boat import export



bike path



rails



secondary road



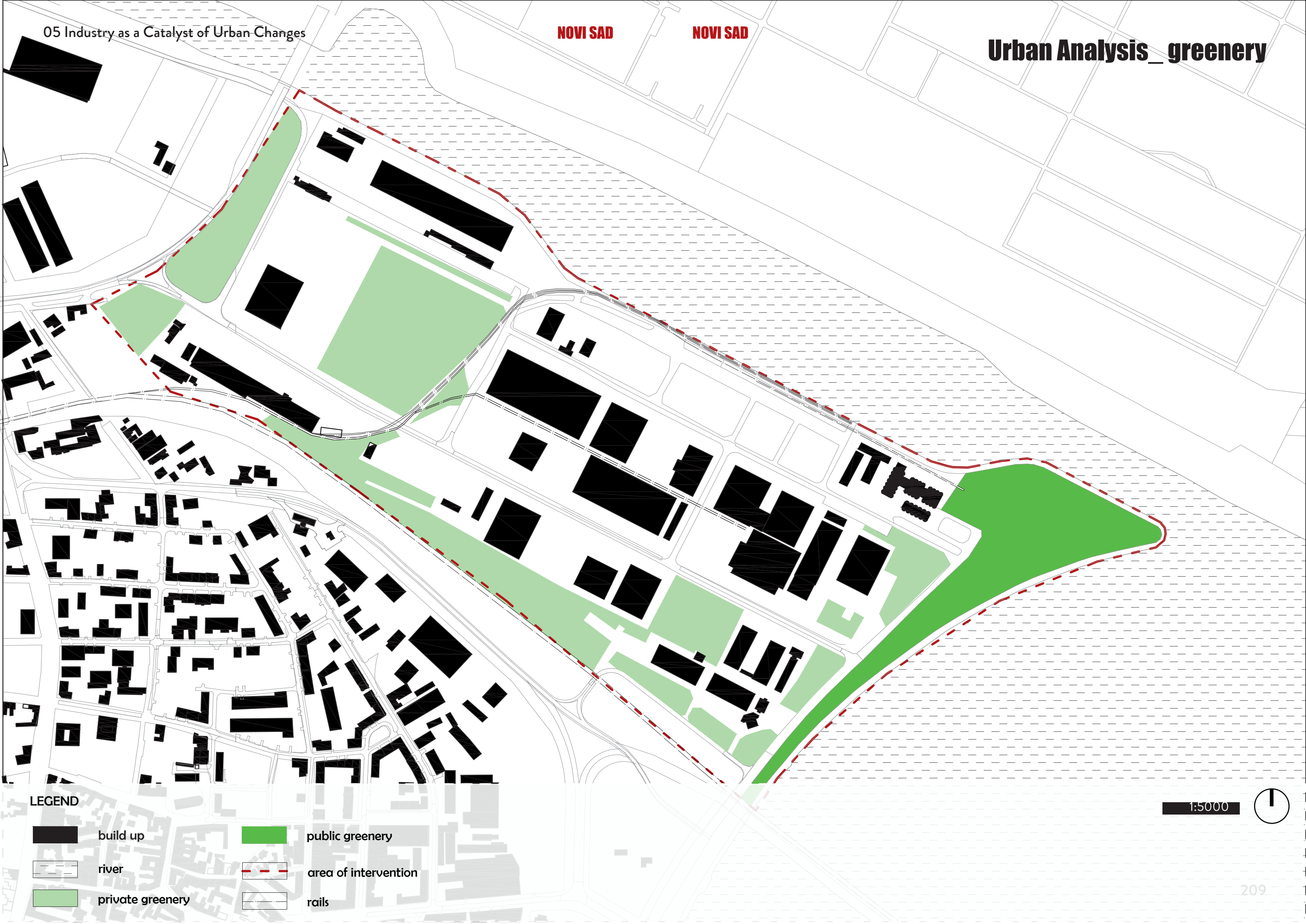
bus station



river

1:5000





LEGEND



build up



public greenery



river



area of intervention



private greenery

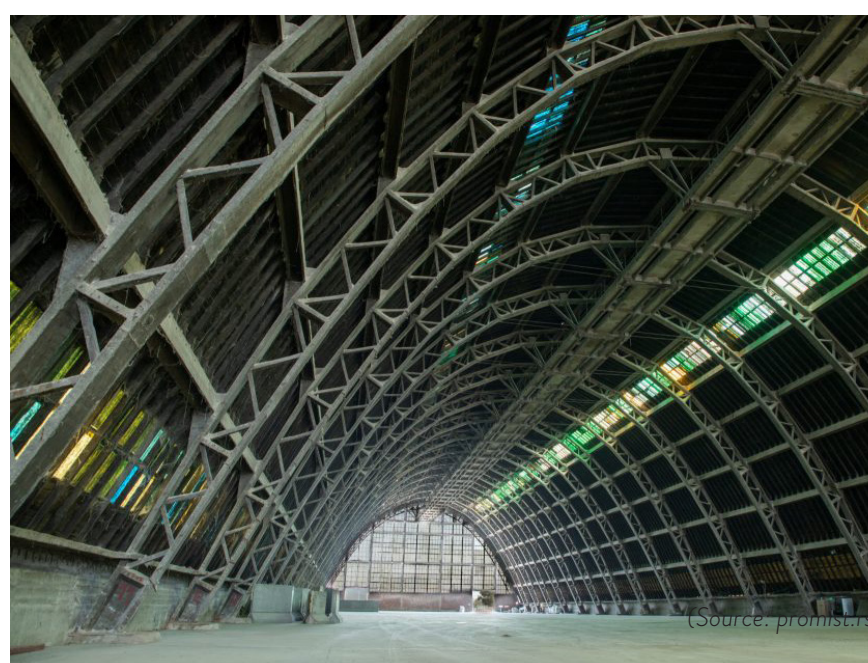


rails

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05 Industry as a Catalyst of Urban Changes



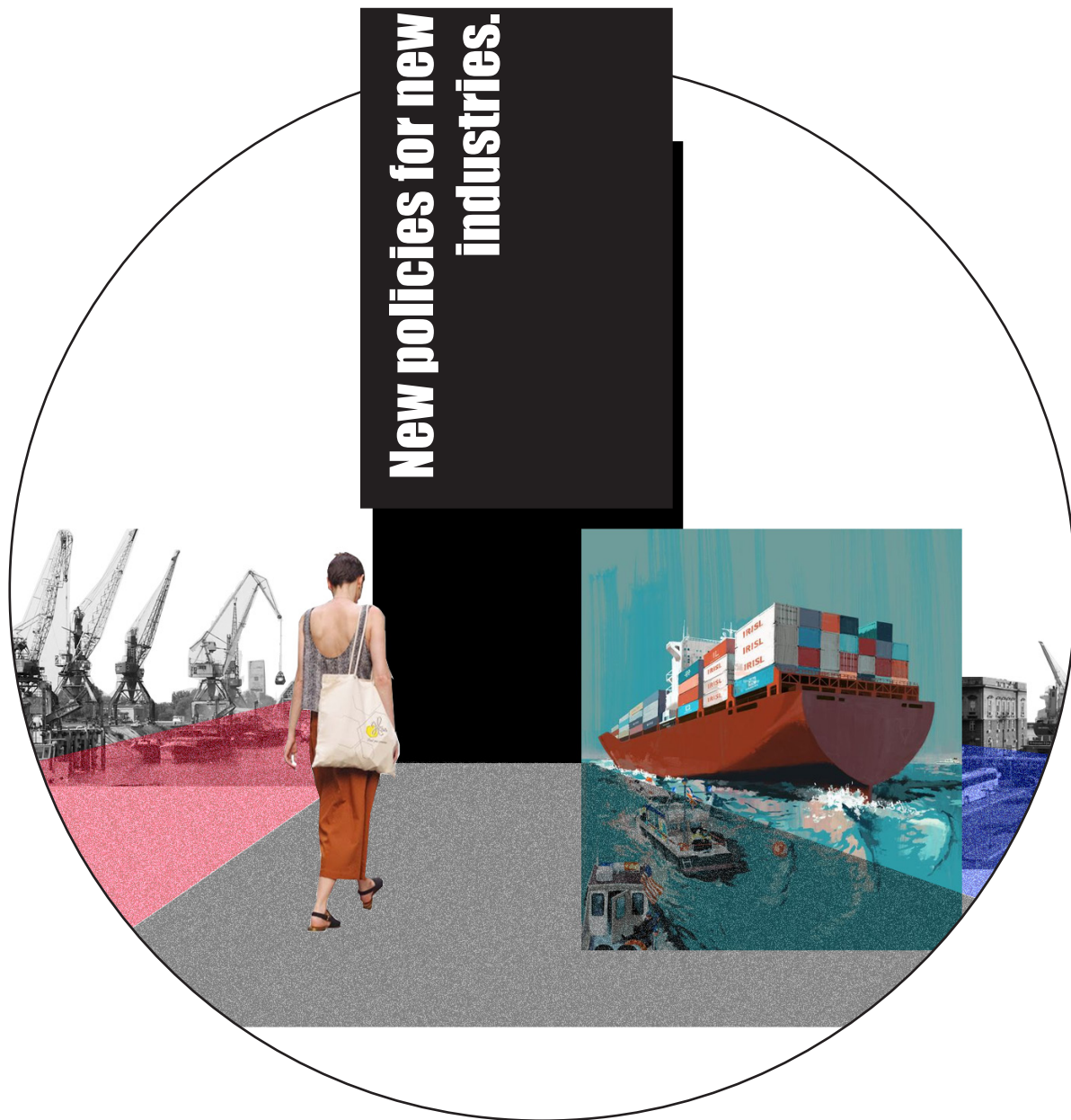
06

Urban Design Strategy

6.1 Urban Design Strategy

Concept

Keywords: Zone-breaking, abandonment, urban gaps, industrial heritage, collective memory, urban regeneration, strategic urban planning



OBJECTIVES

OBJECTIVE 1

Raise awareness about the significance of this location, prompting authorities to take proactive measures for the continued development of these areas.

OBJECTIVE 2

Promote collaboration between stakeholders in both cities to establish a shared approach for blending existing initiatives and resources into new development projects. The aim is to create a versatile, densely developed, and inclusive urban area through joint efforts and shared goals.

OBJECTIVE 3

Use land to test and evaluate innovative forms of mixed-use and integration of existing functions with new industries, paving the way for new private developers.

OBJECTIVE 4

Develop a municipal policy for encourage mixed use for encouraging mixed-use and the integration of existing functions in the transformation of both locations.

AMBITION & APPROACH

Enhance public elements and foster the quality of urban space integrated with productive urban mechanism

DEFINING AN ACTION PLAN

INDIVIDUAL APPROACH AND APPLICATION OF THE PLAN TO THE AREA

DEFINING THE MANAGEMENT AND GOVERNANCE STRUCTURE FOR EACH AREA

GENERAL IDEA AND DEALING WITH TRANSFORMATION OF THE ENTIRE FRINGE

TREATMENT OF THE EXISTING BUILT ENVIRONMENT

PROPOSAL OF NEW MOBILITY SYSTEM

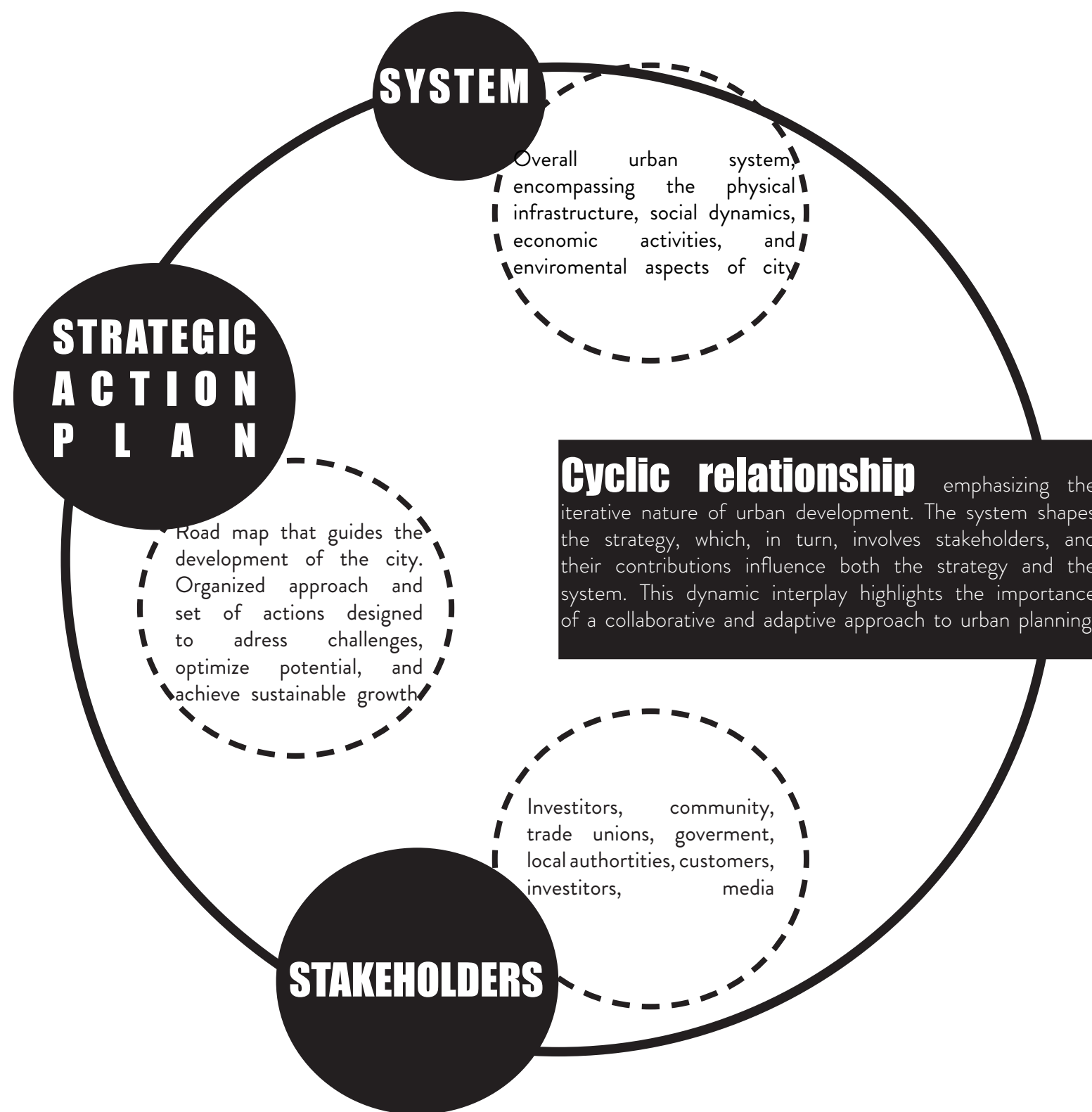
ZONE BREAKING INTO MIXED FRAGMENTS

6.2 Timeframe 1,5,10 year plan

Then necessity of well thought strategic plan

Based on the analyses in the previous chapters, it's clear that both cities share similar challenges. The upcoming discussion outlines a comprehensive plan for urban development in these areas. In the initial year, the focus is on introducing the general public and public servants to the potential of these locations. This involves inclusive discussions and panels with the participation of various stakeholders like the Faculty, students, professors, the Institute of Urban Planning, and the Association of Architects. Over the next five years, the plan includes engaging the mentioned groups and landowners, investors,

and owners of industrial facilities. The 5 – 10 year timeframe, the proposal suggests implementing a master plan in stages. The ultimate goal is to create a self-sustaining urban system with collaboration among all relevant participants. This roadmap aims for a smooth and coordinated path towards urban development, promoting unity and collective effectiveness.



| Ambitions from the strategic plan | Objectives | Sub-objectives | Actions | Timeframe | Responsibility |
|---|---|---|--|------------------|--|
| <p>A well-crafted long-term urban strategy is instrumental in fostering sustainable economic development, enhancing competitiveness, and creating in our cases a resilient and thriving industrial area that benefits both businesses and residents. It aligns stakeholders, sets clear goals, and provides a roadmap for the city's growth and prosperity.</p> | <p>Objective 1: Raise awareness about the significance of this location, prompting authorities to take proactive measures for the continued development of these areas.</p> | <p>Initiate collaboration between Educational Institutions and Institutions of urban planning to explore potential development opportunities for these locations.</p> | <p>Development of a series of studies for examination and discussion, focusing on the improvement of these locations.</p> | <p>1 year</p> | <p>Educational institutions , Institutions of urban planning, Architects.</p> |
| | | <p>Creating New urban strategies proposed by this thesis introduced in the municipality public discussions.</p> | <p>Arranging public lectures.</p> | <p>1 year</p> | <p>Educational institutions, Institutions of urban planning, students</p> |
| | | <p>Promoting of this location among the local population and land owners.</p> | <p>Arranging public debate and discussions.</p> | <p>1 year</p> | <p>Institutions of urban planning, landowners, residents</p> |
| | <p>Objective 2: Promote collaboration between stakeholders in both cities to establish a shared approach for blending existing initiatives and resources into new development projects. The aim is to create a versatile, densely developed, and inclusive urban area through joint efforts and shared goals. This involves engaging representatives from various sectors, fostering open communication, and encouraging partnerships between public and private entities. By sharing relevant data and insights, stakeholders can collectively contribute to the creation of a cohesive and sustainable urban environment.</p> | <p>Initiate and facilitate collaboration between landowners, to see if this can lead to dense and multifunctional development in line with strategic plan.</p> | <p>Collaborate with local stakeholders and landowners in creating a feasibility study.</p> | <p>1-5 years</p> | <p>Institute of Urban planning of Rijeka and Novi Sad in collaboration with the private land owners.</p> |
| | | <p>Facilitate collaboration between developers and local stakeholders with the aim of implementing new and innovative programs in new development areas</p> | <p>Involving the local community in workshops about multifunctional programs, to find and implement new programs when the area is developed.</p> | | <p>Institute of Urban planning of Rijeka and Novi Sad in collaboration with the private land owners and developers</p> |
| | | <p>Raising acceptance for Industrial production as an integrated part of a multifunctional urban fringe by creating areas for local producers, developers, urbanists, and other people interested in the development.</p> | <p>Arranging public lectures.</p> | | <p>Institute of Urban Planning of Rijeka and Novi Sad, Educational institutions, residents, landowners</p> |

| Ambitions from the strategic plan | Objectives | Sub-objectives | Actions | Timeframe | Responsibility |
|--|---|---|--|-------------------|---|
| <p>A well-crafted long-term urban strategy is instrumental in fostering sustainable economic development, enhancing competitiveness, and creating in our cases a resilient and thriving industrial area that benefits both businesses and residents. It aligns stakeholders, sets clear goals, and provides a roadmap for the city's growth and prosperity.</p> | <p>Objective 3: Use land to test and evaluate innovative forms of mixed-use and integration of existing functions with new industries, paving the way for new private developers.</p> | <p>Develop a pilot at the site integrating existing functions with new ones to evaluate and demonstrate the potential of similar private schemes.</p> | <p>Introducing compelling content in overlooked areas within locations to stimulate increased utilization of these spaces.</p> | <p>1-5 years</p> | <p>Institute of Urban Planning of Rijeka and Novi Sad, Educational institutions, developers, landowners</p> |
| | <p>Objective 4: Develop a municipal policy for encourage mixed use for encouraging mixed-use and the integration of existing functions in the transformation of both locations.</p> | | <p>Gather insights and conclusions about mixed use that will be presented to the city council for change of policy.</p> | | <p>Educational institutions, Institutions of urban planning, and architects.</p> |
| <p>Implementation of the Pilot Plan by stages, it's monitoring, and further development.</p> | <p>Objective 1 : Cluster development.</p> | <p>Execute the proposed modifications gradually, proceeding through the space in distinct stages.</p> | <p>Execution of works on locations</p> | <p>5-10 years</p> | <p>Institutions of urban planning, developers, Municipality.</p> |
| | <p>Objective 2 : Investment promotin</p> | <p>Implement policies to attract domestic and foreign investments in key industrial sectors. Develop a one-stop shop for permits and approvals to streamline the business setup process.</p> | <p>Continuously refine terms and advantages for investors in alignment with emerging conditions.</p> | | <p>Institutions of urban planning, Municipality.</p> |
| | <p>Objective 3: Skill Development</p> | <p>Establish partnerships with educational institutions to develop training programs for the local workforce in alignment with industrial needs. Encourage skill development in emerging technologies relevant to the industries.</p> | <p>Introduce faculties to new industries and up-and-coming companies.</p> | | <p>Educational insitutions, companies</p> |
| | <p>Objective : Infrastructure upgrade</p> | <p>Focus on upgrading existing infrastructure such as roads, bridges, and utilities to support industrial growth. Develop a smart city framework for efficient resource management and sustainability.</p> | <p>Examine the evolving requirements of emerging industries to adjust infrastructure utilization and enhance capacity.</p> | | <p>Institutions of urban planning, developers, Municipality.</p> |

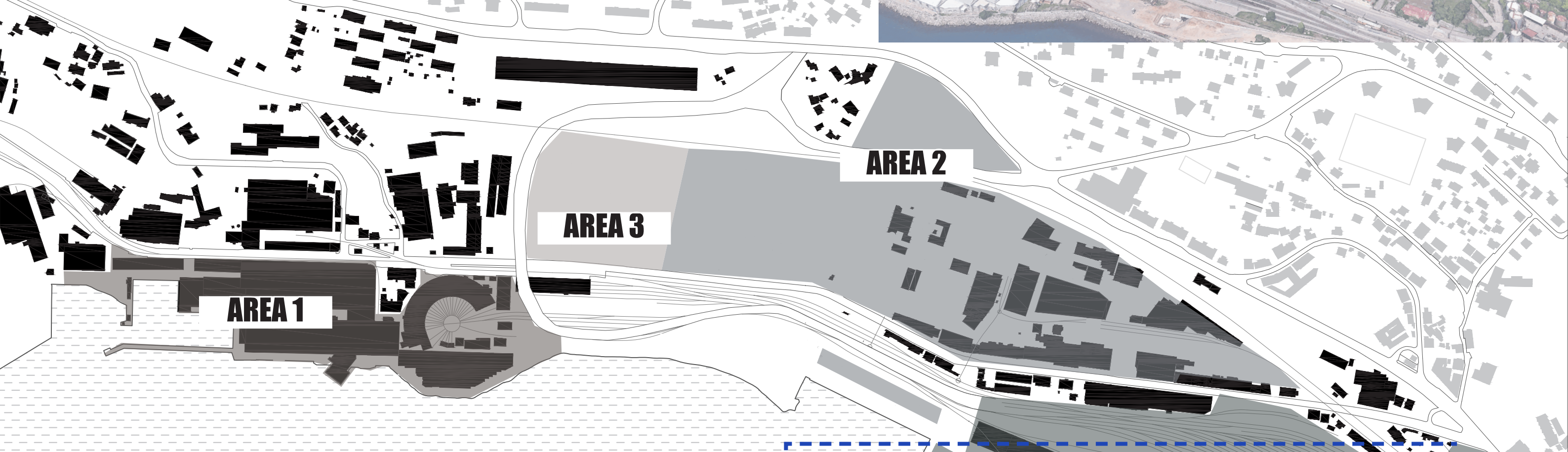
Rijeka



Urban Design Strategy and Proposal
Urban Design Strategy ACTION PLAN AREAS



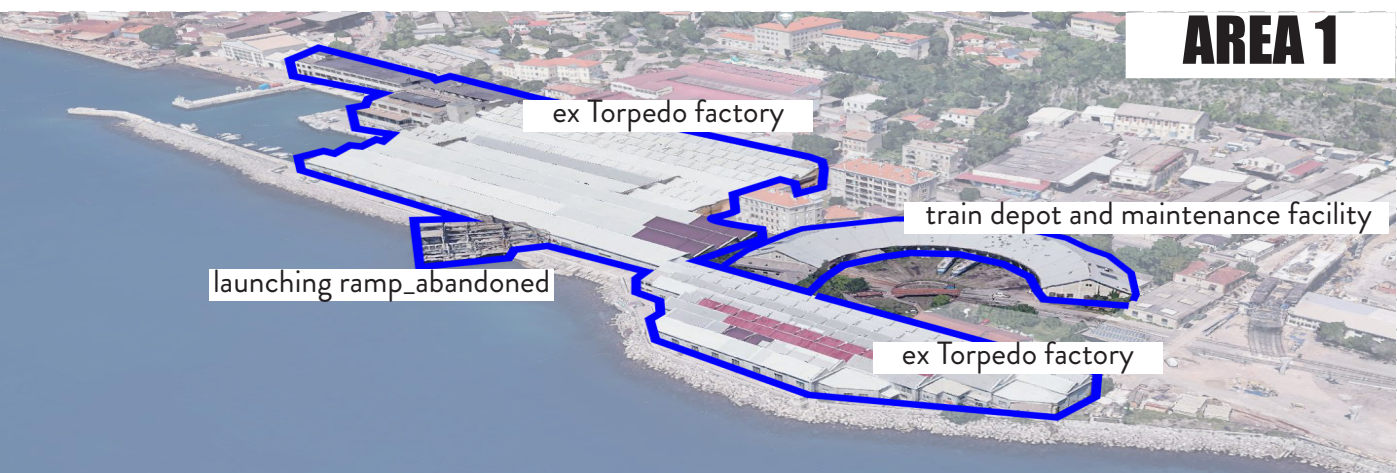
AREA 3



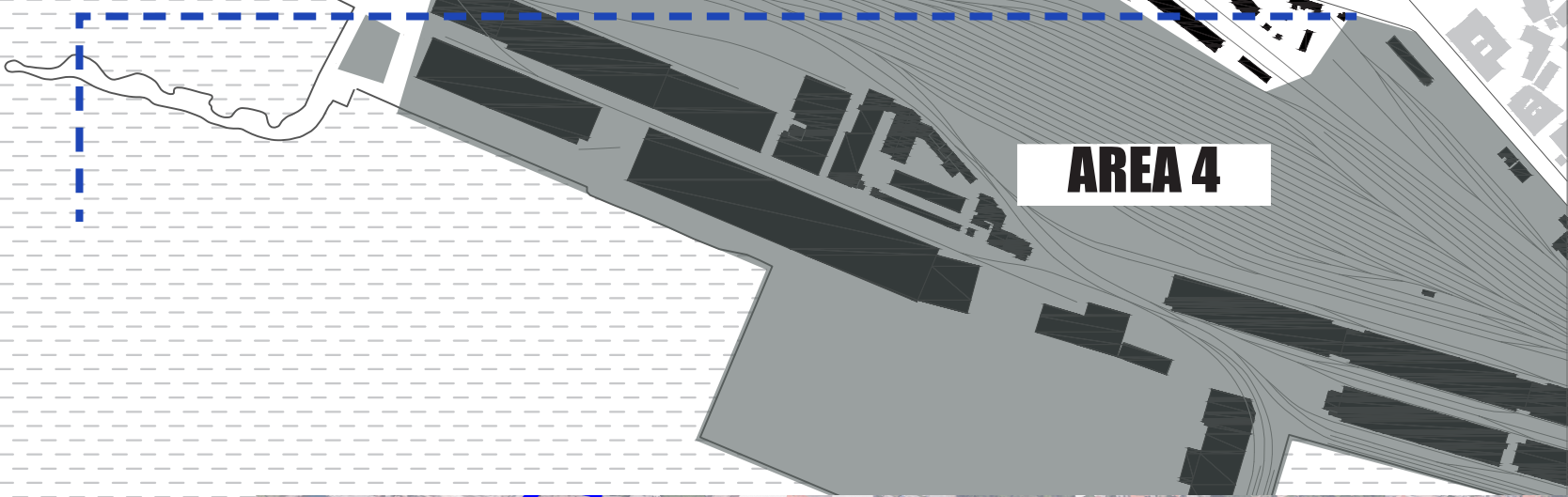
AREA 1

AREA 2

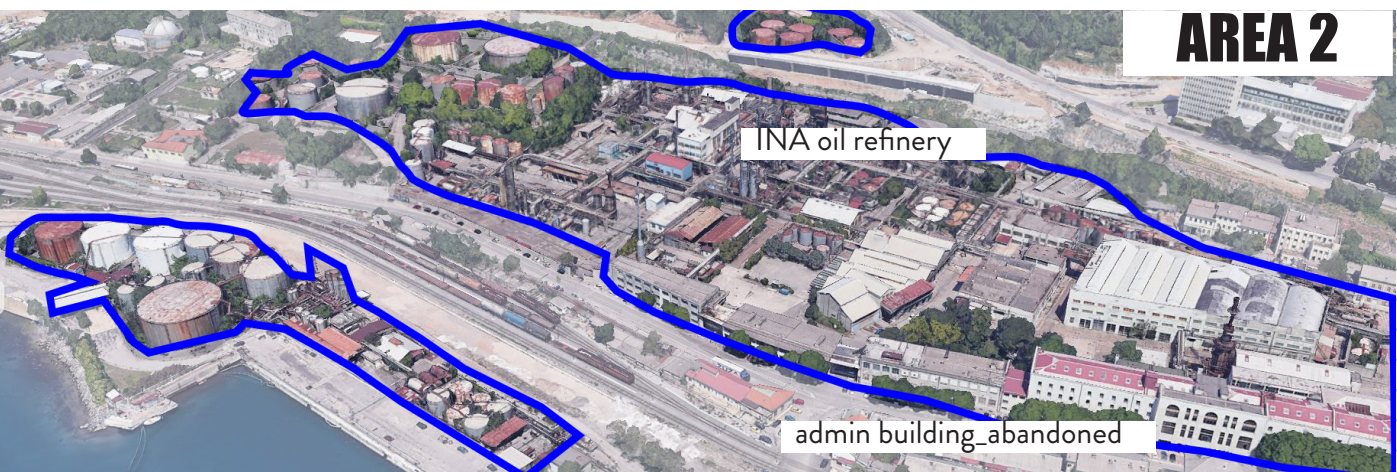
AREA 3



AREA 1



AREA 4



AREA 2



AREA 4

AREA 1**Ex Torpedo Zone | Economic - Industrial Zone | 41k m²****OBJECTIVE 2**

Given that the Torpedo Engine Factory is inactive and deserted, the local government should act as the primary representative of the Torpedo facilities, being the major stakeholder. To repurpose the buildings, it's essential to involve urban planning institutions and academia significantly.

The main building could be preserved for exhibitions and commercial activities, while the remaining spaces could be allocated to small private developers through public tender processes. This initiative should be a city-wide project, allowing residents to participate and contribute as well.

OBJECTIVE 3

To support the adaptive reuse of the entire former Torpedo complex, a land test will be conducted on the main factory building located next to the pedestrian-accessible waterfront. The chief architect envisions incorporating a closed farmers market, along with leisure and commercial activities, including a street food concept, to attract residents to explore the waterfront and support local businesses. The spacious interior can also accommodate live concerts

OBJECTIVE 4

Gather insights and conclusions about mixed use and community integration in

the revitalized zone of Area 1 that will be presented to the City Council for a change of policy.

AREA 2**INA Oil Refinery | Industrial Zone | 170k m²****OBJECTIVE 2**

In this area, the collaboration among stakeholders is particularly crucial, as emphasized by OBJECTIVE 2. The primary local stakeholder is the local government, which must closely collaborate with the state government to reach an agreement with

OBJECTIVE 3

To advance multifunctionality and densification in Area 2, the city government must allocate space for assessment. The administration building, serving as the gateway to the former refinery zone, is pivotal for exploring opportunities with local private stakeholders to foster new technological industries. The chief architect envisions transforming the entire zone into a technological maritime center, utilizing existing valuable buildings for hub activities. The remaining land will be allocated to private

OBJECTIVE 4

Gather insights and conclusions about mixed use and industrial integration in the densified

the Hungarian private owner of the land. A feasibility study must be conducted, and hazardous equipment from the abandoned refinery must be removed. Both urban planning institutions and governments should be involved to facilitate private-public agreements.

owners through a public tender process. The envisioned urban fabric of Area 2 will comprise a diverse blend of newly designed structures for the maritime technological center alongside repurposed buildings from the refinery era. This approach will lay the groundwork for a more dynamic transformation of the site, serving as a prototype for integrating technological, commercial, community, and residential functions.

zone of Area 2 that will be presented to the City Council for a change of policy.

AREA 3**Mixed Economic-Industrial Zone | 31,900 m²****OBJECTIVE 2**

Before initiating any collaborations in this area, it is essential to foster dialogue between the local government and key private stakeholders such as Energo d.d. and Metis. Given that large plots in the area remain predominantly single-functioning and underutilized, private stakeholders

OBJECTIVE 3

The concept of multifunctionality and densification will be showcased in the land test in Area 3, particularly in the first row stretching horizontally from west to east just above Milutin Barač Street. In this area, the chief architect envisions the development of four-story residential and economic-commercial buildings, resembling those found in the current downtown area of Rijeka. The ground floors of these buildings will be designated for commercial use, fostering vibrant public urban life for

OBJECTIVE 4

Gather insights and conclusions about mixed use and industrial integration in the densified

should collaborate with the urban planning department to conduct feasibility studies. This aims to fragment the land and attract additional private developers to densify the urban fabric. The chief architect proposes the removal of low-rise industrial buildings to facilitate the establishment of a denser urban grid in this area.

residents while also providing fragmented commercial spaces for private developers to densify the urban grid in Area 3, which seamlessly transitions into Area 2. Moving further inland, the size of functions and plots increases to accommodate the ongoing industrial activities of Energo d.d. and Metis, with a reduction in heavy operations within the downtown area. This strategic approach aims to balance the need for industrial functionality with the goal of creating a more diversified and dynamic urban environment in Area 3.

zone of Area 3 that will be presented to the City Council for a change of policy.

AREA 4**Port of Rijeka and Croatian Railway Zone | 257k m²****OBJECTIVE 2**

Before initiating any collaborations in this area, it is essential to foster dialogue between the local government and key private stakeholders such as Energo d.d. and Metis. Given that large plots in the area remain predominantly single-functioning and underutilized, private stakeholders

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zone of Area 4 that will be presented to the City Council for a change of policy.

06 Urban Design Strategy and Proposal

Urban Design Strategy MANAGEMENT AND GOVERNANCE STRUCTURE

The predominant ownership of the focused area by the state reflects a historical legacy and a transitional societal challenge. Thus, collaboration should primarily involve national and local governments, along with the Urban Planning Department at both levels, to customize urban policies for the area's integrated development with

private developers. The core idea of land fragmentation is to enable the creation of a densified, human-scale grid and to attract smaller developers instead of solely relying on large capital investors, thereby avoiding the unsuccessful trajectory evident in the current state of abandonment and deterioration.

AREA 1

Ex Torpedo Zone | Economic - Industrial Zone | 41k m²

In the case of Area 1, the goal is to resolve legal disputes to transfer the ex-Torpedo Engine Factory into the possession of the local city government. This site holds significance for citizens, reflecting efforts to explore its history

and integrate it into the city's identity. The aim is for changes and reuse of the facilities to originate bottom-top, empowering private individuals to participate in the redevelopment of Area 1.

AREA 2

INA Oil Refinery | Industrial Zone | 170k m²

Area 2 requires transnational collaboration between the state government, local authorities, and the Hungarian group MOL, which owns the INA refinery. The proposal suggests that the Hungarian landowner commits to cleaning up the land from hazardous industrial operations in cooperation with relevant government departments, and allows local stakeholders to propose land fragmentation to create

a densified mixed-use urban center. Upon completion of these efforts, the Hungarian owner may become the majority owner of all development projects within the boundaries of their property. The state may potentially allocate suburban city land in the business-industrial zone to negotiate with them. It is crucial to emphasize that the current outdated facility poses a threat to current residents.

AREA 3

Mixed Economic-Industrial Zone | 31,900 m²

Area 3 aims to integrate into the densified urban grid through collaboration between private owners and the local government to facilitate land distribution. The Urban Planning

Department will assist in optimizing land use by owners, while the local government will encourage them to take proactive steps and promote collaboration.

AREA 4

Port of Rijeka and Croatian Railway Zone | 257k m²

Area 4 is poised to undergo significant transformation, potentially reshaping the city's urban landscape. While the straightforward aspect lies in the national ownership structure, the main challenge is navigating through bureaucratic inertia at the national level. Collaboration between local and state urban planning departments

is essential to effectively manage land fragmentation and achieve the desired densification of the urban grid. Additionally, modernizing the railway infrastructure will require external private investment, underscoring the importance of aligning land management efforts with infrastructural upgrades.

POLICY CHANGE

After the action plan is implemented, an the urban planning institute together with the local chief architect should gather all findings before operations begin in the area and propose legal changes. These proposals should aim to accelerate plan implementation and be presented to the government of the Republic of Croatia. The laws should focus on:

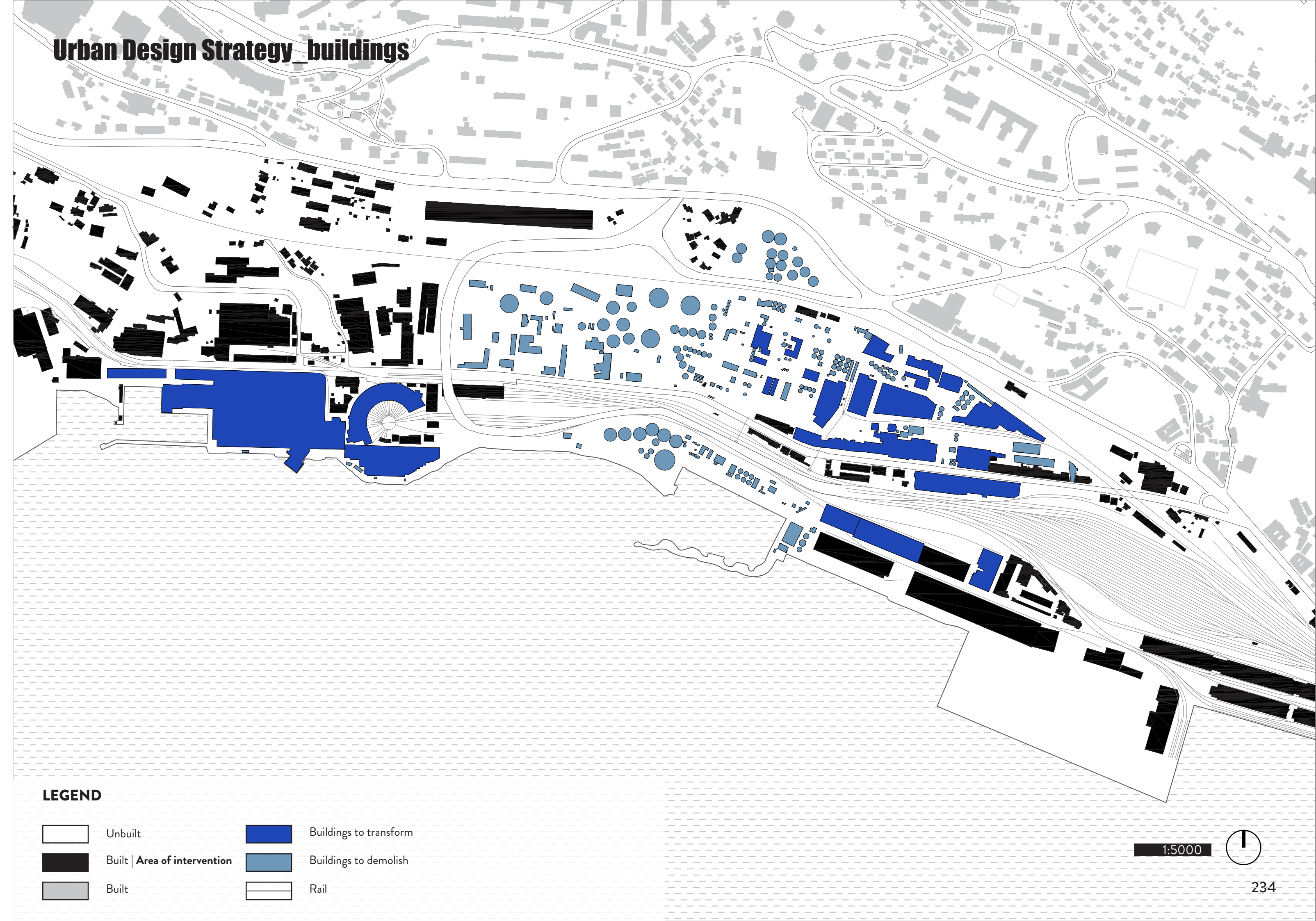
- Encouraging stakeholders to adopt a mixed-use approach in organizing working environment.

- Revise the 10-year urban plan of the City of Rijeka and propose amendments,
- Establishing a law to support current and future investors opting for this business approach.
- Simplifying land parceling and building permit processes to expedite plan implementation.

06 Urban Design Strategy and Proposal
Urban Design Strategy_ GENERAL IDEA AND DEALING
WITH TRANSFORMATION OF THE ENTIRE FRINGE
 TREATMENT OF THE EXISTING BUILT ENVIRONMENT



Ex Torpedo Factory and Launching Station
 To be transformed



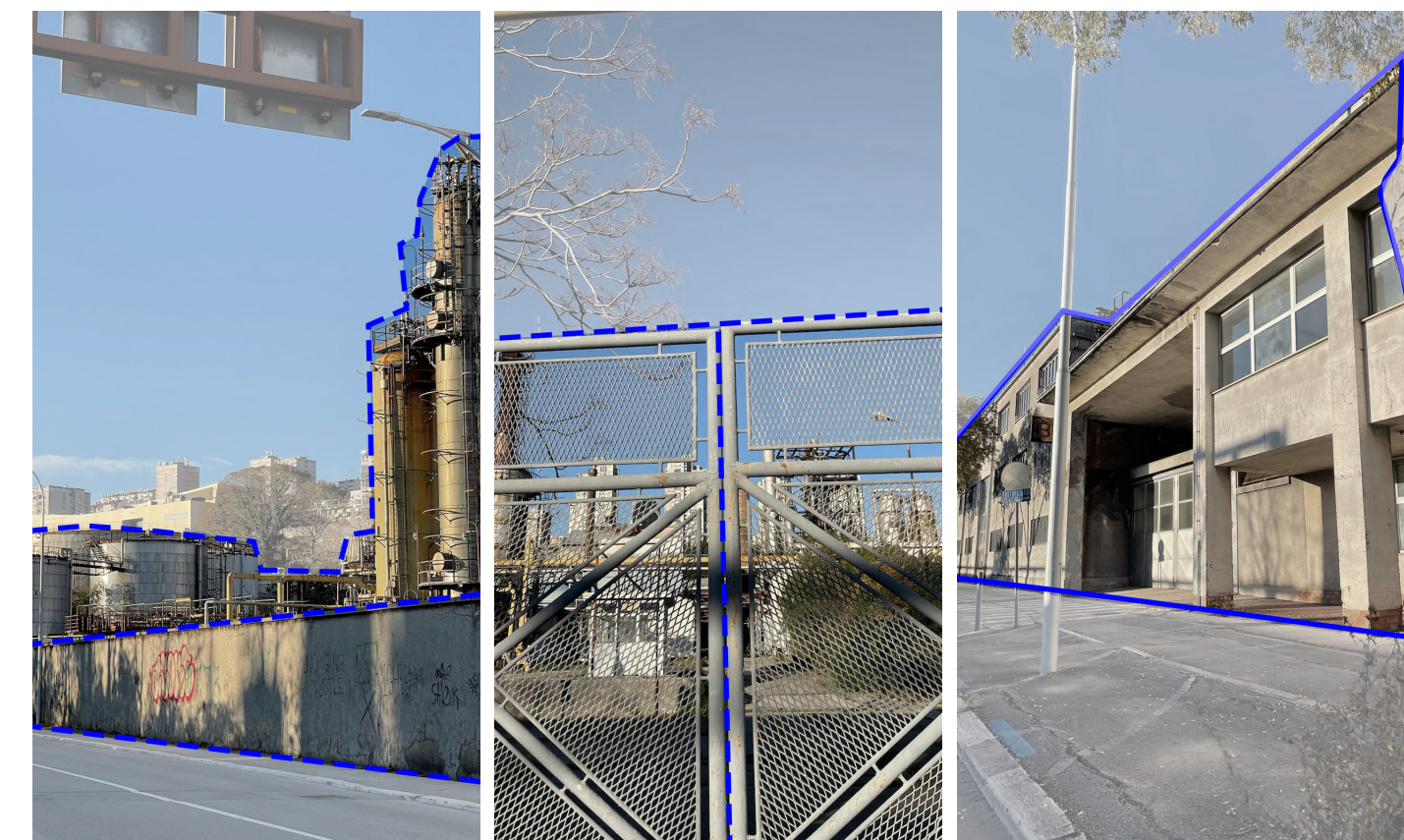
LEGEND

- | | |
|------------------------------|------------------------|
| Unbuilt | Buildings to transform |
| Built Area of intervention | Buildings to demolish |
| Built | Rail |

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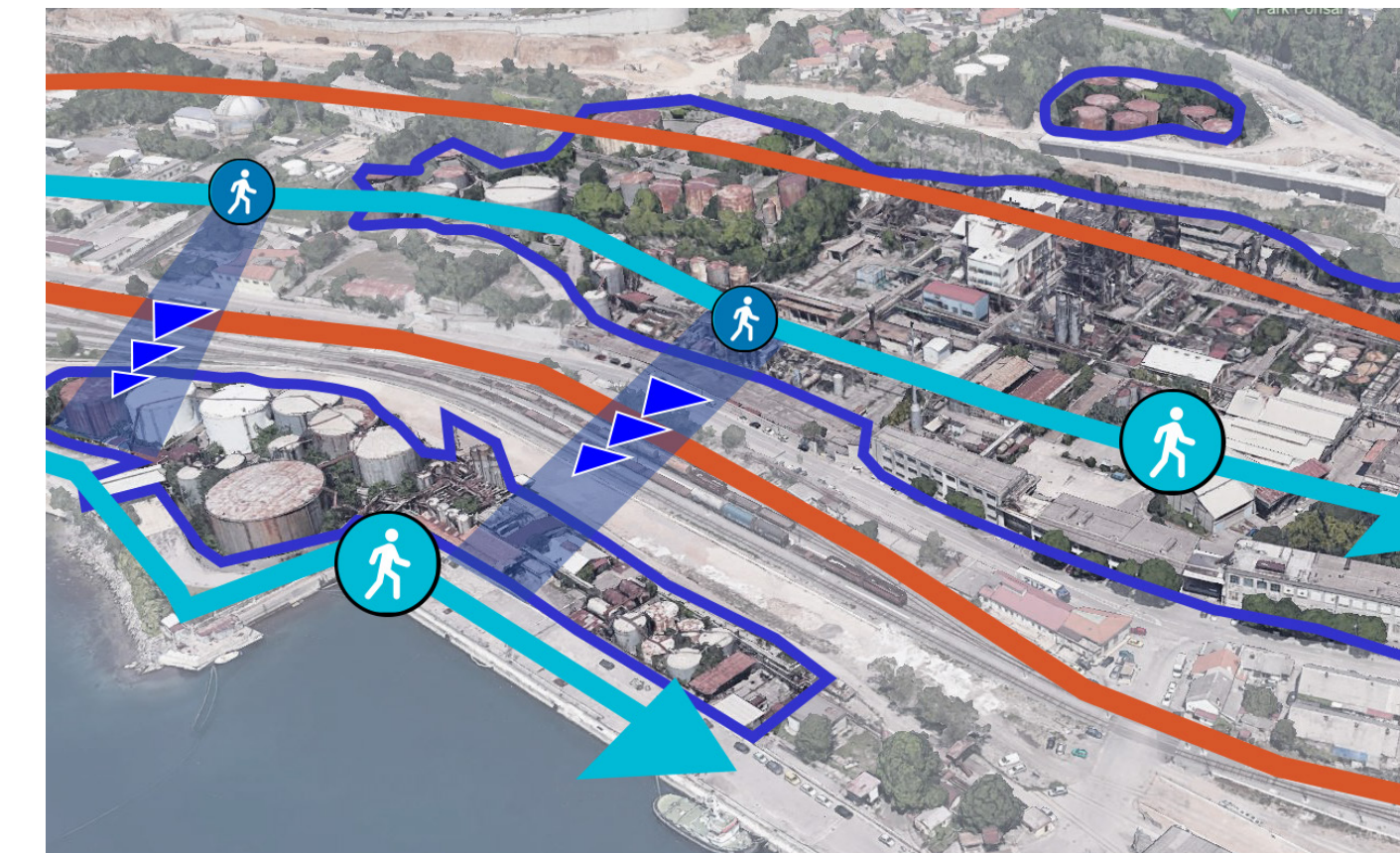
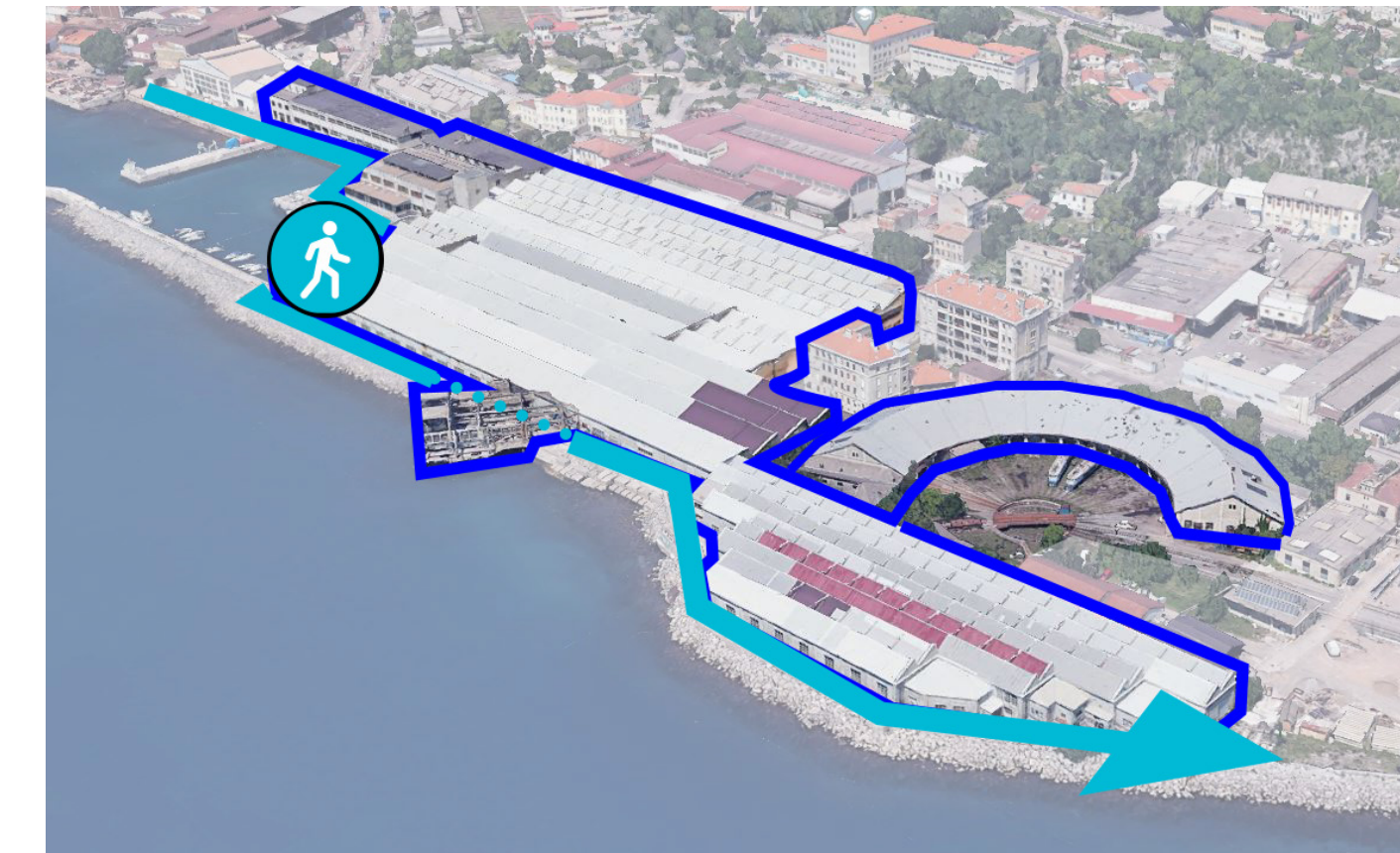
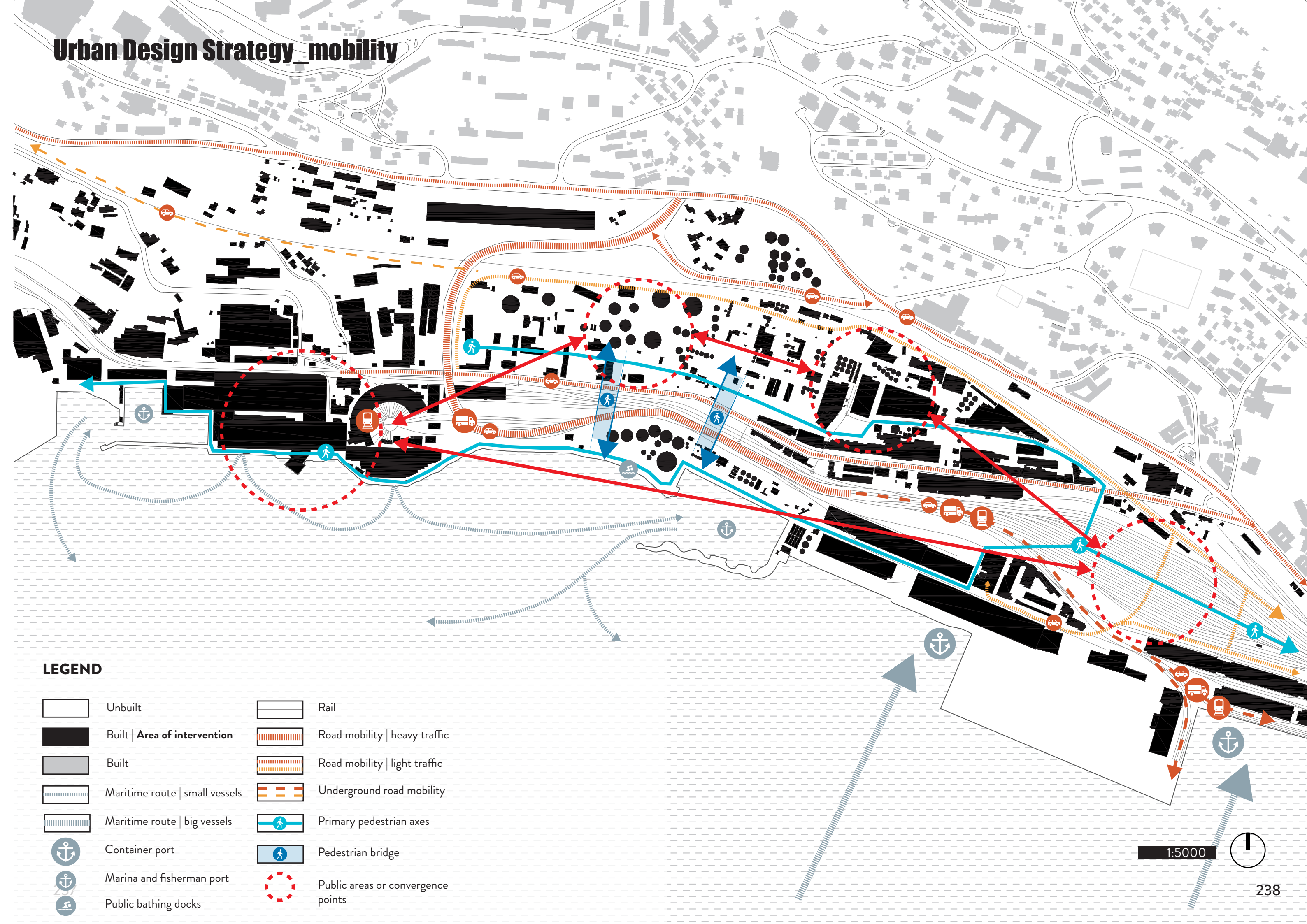
INA Oil Refinery
 To be demolished



06 Urban Design Strategy and Proposal
Urban Design Strategy_ GENERAL IDEA AND DEALING WITH TRANSFORMATION OF THE ENTIRE FRINGE
 PROPOSAL OF NEW MOBILITY SYSTEM

The expansion of the mobility network aims to improve transportation diversity and connectivity in the area. This includes establishing entirely pedestrian zones in four key public areas. Adjacent to Milutin Barać Street in the north, a secondary road facilitates the movement of personal vehicles for residents' convenience. The urban design prioritizes green pedestrian bridges underground parking in the new quarters. Furthermore, maritime traffic

aligns with various port types. Public access is granted to commercial and fisherman ports, while the container port remains restricted. The railway zone is minimized and relocated underground to increase downtown density. Improving waterfront openness involves landscaping the promenade and introducing public bathing docks. Additionally, green pedestrian bridges enhance connectivity over traffic infrastructure.



Heavy industry | Port of Rijeka

The port area maintains its current waterfront configuration due to the prominent presence of container docks, which define the urban landscape. However, the surrounding mixed zones aim to provide public access closer to port activities without disrupting heavy operational functions. Taking examples from cities like Copenhagen, the chief architect envisions commercial zones for street food and leisure, as well as public swimming docks overlooking the port. On the northern side, where the former railway used to be (now underground), there's a dynamic mix of light industry, corporate, and social zones, aiming to modernize port activities.

Light industry

This zone operates as a single-function area within the existing urban landscape. Therefore, rather than removing it, our focus is on integrating mixed-use zones around it. This zone primarily refers to the activity and ownership of the 3rd May Shipyard Rijeka.

Light industry mix commercial

This zone is envisioned to embody the principles of a productive city by integrating light industries and production with predominantly ground-floor commercial activities, including small retail shops, cafes, and groceries. This mixture enhances the work-life balance within the city grid and provides opportunities for sites to be experienced and utilized differently. Notably, the EX TORPEDO FACTORY is being transformed into an enclosed farmers market with commercial and co-working spaces, making use of the small fisherman port.

Light industry mix corporate

The predominant zone highlighted in this

tone encompasses the described "Area 3," which consists of the INA oil refinery land fragments. Similar to the previous zone, it is envisioned to host a combination of light industry along with corporate and digital workspaces. By transforming the area for use as a Tech/Maritime Hub and designing new contributing buildings according to the purpose of the zone, this coloration will enable the creation of a smart hub.

Corporate zone

In this area, we are not advocating for a monofunctional corporate zone, but rather allocating space adjacent to the port to envision a new future for the port. Our vision includes the construction of high-rise office buildings in this designated area.

Social housing

The social housing zone is situated on the former land of the INA oil refinery due to its proximity to the existing monofunctional residential zone.

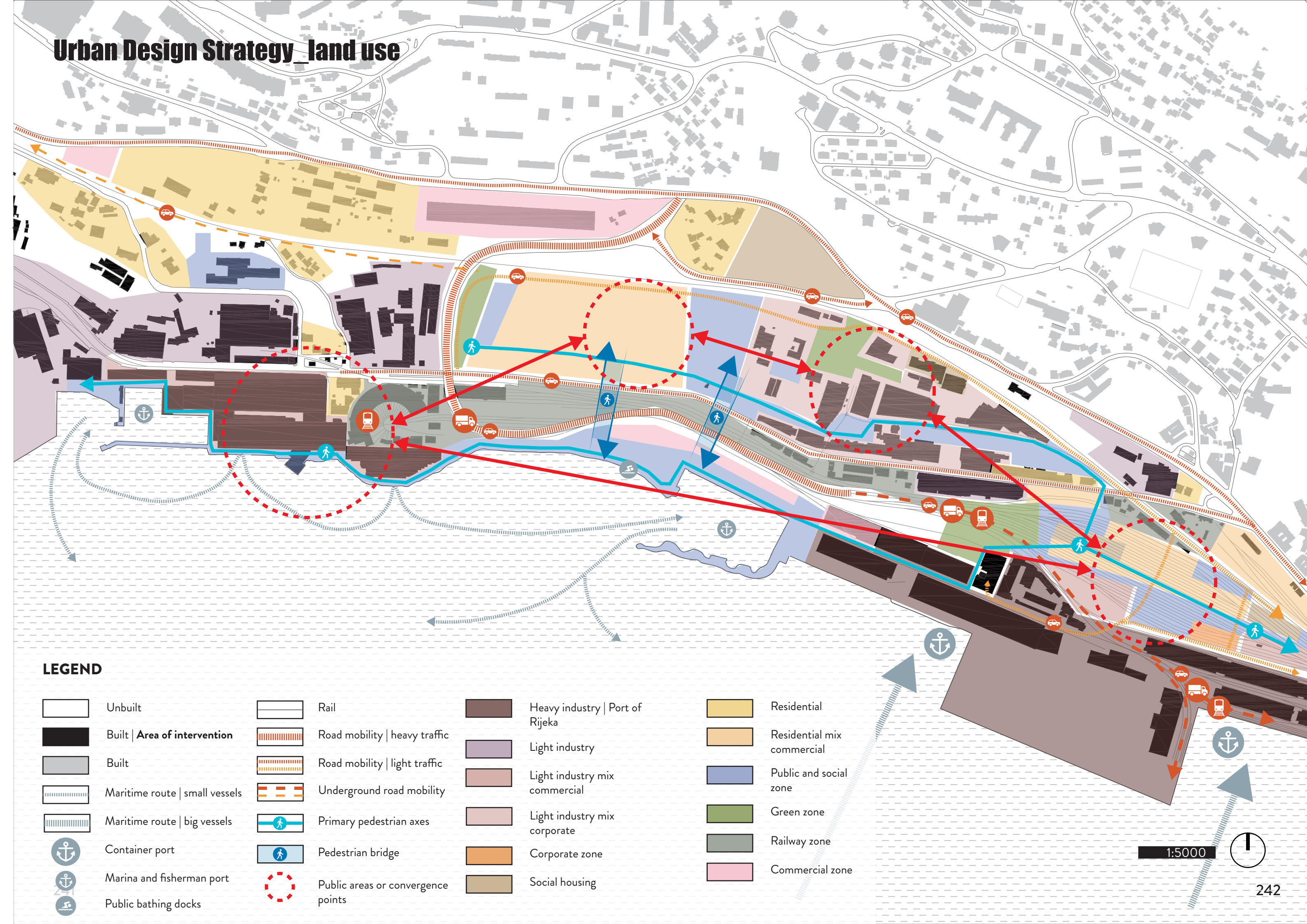
Residential

All existing mono residential zones on the map are currently operational. These areas typically lack a diverse mix of functions and consist of buildings up to five floors. They are surrounded by greenery and parks, with street parking available, but lack any commercial functions, even on the ground floor.

Residential mix commercial

This zone is introduced to blend and intensify the residential grid with ground-floor commercial activities. The aim is to replicate the ambiance of the current Rijeka downtown and the main pedestrian axis, Korzo. The majority of land in "Area 2" is designated in

Urban Design Strategy_ land use



this color, seamlessly transitioning into the smart tech hub where the public is envisioned to have free access and contribute to a vibrant work and life atmosphere. This concept is also applied on the right-hand side of the map, atop the underground railway, with densified pedestrian streets, buildings of up to five floors, sloped roofs, and small commercial spaces on the ground floor, fostering a lively urban environment.

Public and social zone

This zone is designated for a pedestrianized and landscaped waterfront, featuring public swimming docks, playgrounds, and both open and closed sports areas. Additionally, educational buildings are marked within this area.

Green zone

Public greenery and parks.

Railway zone

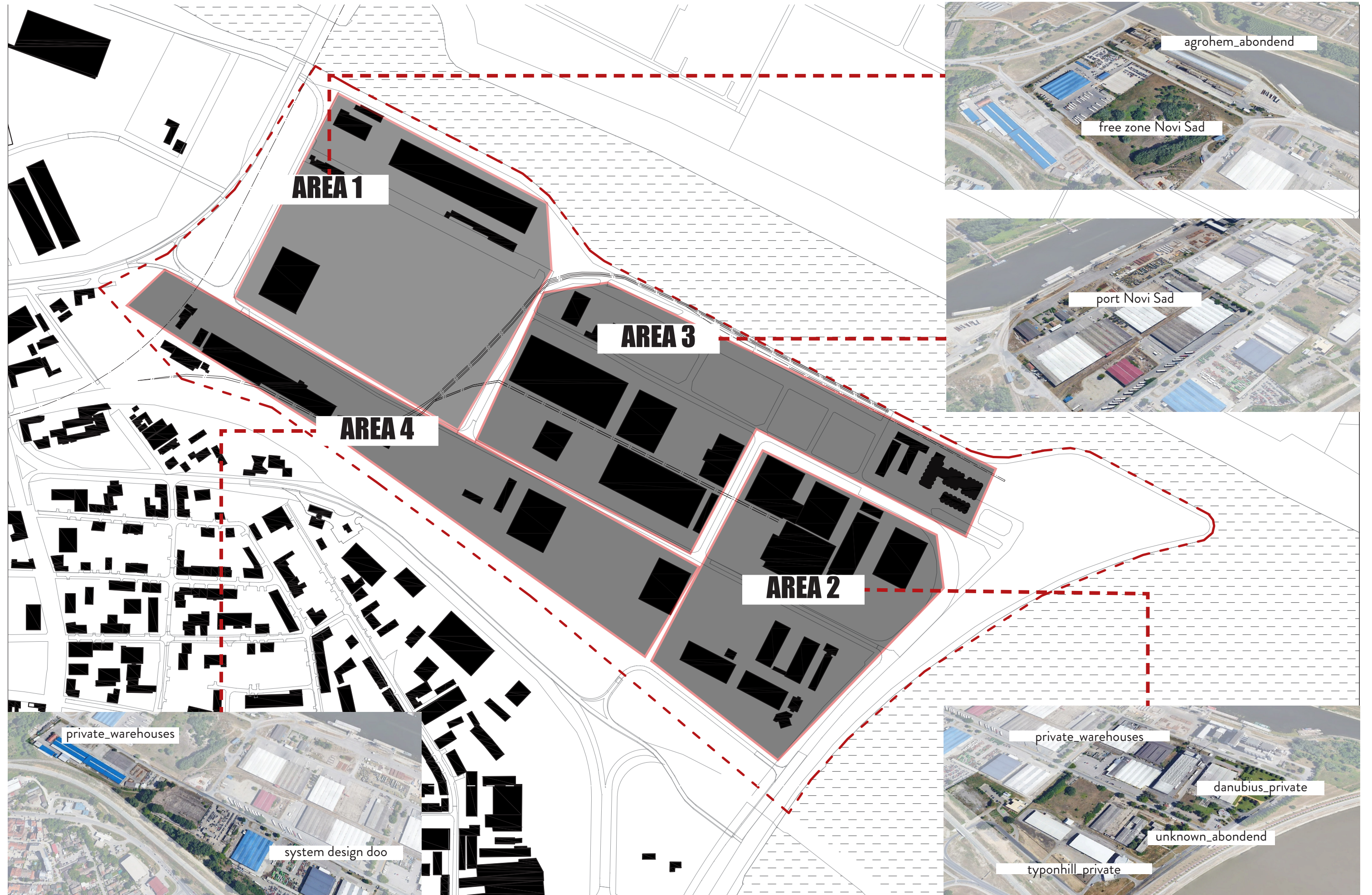
The main railway line is intended to remain in its current location, but the wider section on the right-hand side of the map is envisioned to be placed underground. This aims to break the urban boundary and provide better access to the waterfront.

Commercial zone

Rijeka currently has an excessive number of hypermarkets and supermarkets relative to its size, which appears to be unnecessary. The existing commercial zones are already operational, and there are no plans to expand them further.

Novi Sad





Urban Design Strategy_ IMPLEMENTATION OF ACTION PLAN

AREA 1

AGROHEM_40.700m2
FREE ZONE NOVI SAD_98.400m2

OBJECTIVE 2

Initiate government-led efforts by the Republic of Serbia to resolve legal issues regarding Agrohem. The local government should consider acquiring this land due to its potential for development. Agrohem should be integrated into the Free Zone and treated as a cohesive unit.

The Urban Planning Institute should establish clear guidelines and limitations for future investments, emphasizing

OBJECTIVE 3

Develop comprehensive feasibility studies to assess the viability of novel mixed-use developments incorporating elements of sports, residential living, and commercial activities.

Create zoning plans strategically integrating sports and residential facilities. Emphasize the connection with water, which should be a priority in

OBJECTIVE 4

Advocate for the government's adoption of this policy, urging prompt action to initiate the necessary legislative changes and administrative measures to support the development of mixed-use areas.

Engage stakeholders from various

new functions such as sports and residential areas. Enhance the modern way of life and connect residents with water. Emphasize preserving Agrohem's warehouse space, which holds significant aesthetic value. This site could potentially become a new symbol of the area.

Organize public seminars to attract potential investors.

popularizing this zone.

Furthermore, recognize the importance of community engagement and consultation throughout this process, ensuring that the proposed developments align with residents' aspirations and needs.

sectors, including urban planners, developers, community leaders, and residents, in collaborative discussions and consultations to refine and tailor the policy to local contexts and priorities.

AREA 2

DANUBIUS_PRIVATE
WAREHOUSES_65400m2
TYPONHILL_24200m2

OBJECTIVE 2

Conduct feasibility studies for each company to assess their potential contributions to collaborative urban development.

Propose zoning plans and improve organization for the warehouse areas of each company to optimize space usage

OBJECTIVE 3

Develop feasibility studies for a new mixed-use approach integrating coworking spaces and other innovative concepts.

Explore opportunities for integrating

OBJECTIVE 4

Present information and the benefits of such changes during public seminars to raise awareness and garner support. Engage with local stakeholders to gather input and insights to develop

and efficiency.

Organize collaborations between landowners and local stakeholders to implement new innovative programs such as shared office spaces, industrial hubs, and coworking areas.

existing functions with new industries to create vibrant and dynamic urban spaces.

comprehensive municipal policies.

Advocate for the adoption of these policies by the government to create an enabling environment for mixed-use integration and urban transformation.

AREA 3

PORT NOVI SAD_140.00m2

OBJECTIVE 2

The primary collaboration here would be between the port owners and the local government. The local council should endorse and propose interventions for integrating this area into the urban fabric. A feasibility study conducted by the urban planning department should

OBJECTIVE 3

To achieve this objective, we propose conducting a comprehensive feasibility study that goes beyond traditional land use assessments. This study will encompass the functioning of Port Novi Sad in conjunction with retail, commercial spaces, and hospitality sectors. By analyzing the potential synergies between different land

OBJECTIVE 4

To achieve this objective, we propose presenting the policy plan to the port owner and the local

persuade the owners to reorganize warehouse spaces to free up areas for new uses. Liberating the waterfront and expanding the harbor to the opposite side of the channel would create new public space.

uses and industries, we can identify opportunities for creating vibrant and multifunctional urban spaces that cater to the community's diverse needs.

government. By engaging with these key stakeholders, we can garner their support and collaboration in effectively implementing the policy measures.

AREA 3

SYSTEM DESIGN DOO_PRIVATE
WAREHOUSES_85.000m2

OBJECTIVE 2

To revitalize this area, all stakeholders must be involved. Firstly, each stakeholder should produce a feasibility study, reorganize, and improve their business operations. Maximizing

OBJECTIVE 3

Conduct a new feasibility study that includes social housing and its integration into the existing urban fabric. This study will assess the feasibility and

OBJECTIVE 4

Present the policy plan to the Serbian government, advocating for legislative changes to incentivize stakeholders to take further action. By aligning policy incentives with the goals of mixed-use

space utilization, on the other hand, should free up space for social housing initiatives.

potential impact of incorporating social housing into mixed-use developments, providing valuable insights for future urban planning initiatives.

integration, we can create a supportive regulatory environment that facilitates sustainable urban development and revitalization efforts.

06 Urban Design Strategy and Proposal

Urban Design Strategy MANAGEMENT AND GOVERNANCE STRUCTURE

The majority of landowners are private individuals, and the success of most actions and implementations will hinge upon their cooperation and participation. Consequently, it becomes imperative to individually assess each case to ascertain the requirements and advantages of implementing

such changes in the private sector. Establishing an external, independent body is essential to oversee the benefits and execution of the plans.

AREA 1

AGROGEM_ 40.700m2
FREE ZONE NOVI SAD_ 98.400m2

In the case of Area 1, which presents the simplest scenario, resolving legal property disputes should precede the transfer of Agrohema's land to state ownership. Subsequently, the Institute for Urban Planning should

take the lead role in orchestrating the implementation and advancement of the plan.

AREA 2

DANUBIUS_PRIVATE WAREHOUSES_ 65400m2
TYPONHILL_ 24200m2
UNKNOWN_ABONDEND_ 27600m2

Area 2 presents a distinctive challenge as all private landowners engage in various industries. Therefore, it is crucial to establish an external body to facilitate meetings to determine collaborative strategies to optimize shared storage capacity. Upon completion of these individual efforts, the Institute for

Urban Planning assumes primary responsibility for zone reorganization and the execution of plans for social housing and commercial utilization.

AREA 3

PORT NOVI SAD_ 140.00m2

The complexity of Zone 3 arises from the fact that a foreign investor wholly owns the port. To address this, an external body should be formed to engage in discussions with the port owner to devise optimal solutions for the progress and transformation of

both the port and the surrounding area. Subsequently, the involvement of the Government of the Republic of Serbia, along with the Institute for Urban Planning, becomes crucial in influencing the further evolution of the plan.

AREA 4

SYSTEM DESIGN DOO_PRIVATE WAREHOUSES_ 85.000m2

Zone 4 is notable for the inadequate land use by owners. In response, the urban planning institute should enact measures to guide landowners in delineating their properties appropriately. Upon completion of

these adjustments, the Government of the Republic should encourage owners to take further actions and foster collaboration.

POLICY CHANGE

After the action plan is implemented, an independent body and the urban planning institute should gather all findings before operations begin in the area and propose legal changes. These proposals should aim to accelerate plan implementation and be presented to the government of the Republic of Serbia. The laws should focus on:

- Encouraging stakeholders to adopt a mixed-use approach in organizing working environment.
- Suggesting amendments to the ten-

year Spatial Urban Plan of Novi Sad,

- Establishing a law to support current and future investors opting for this business approach.
- Simplifying land parceling and building permit processes to expedite plan implementation.

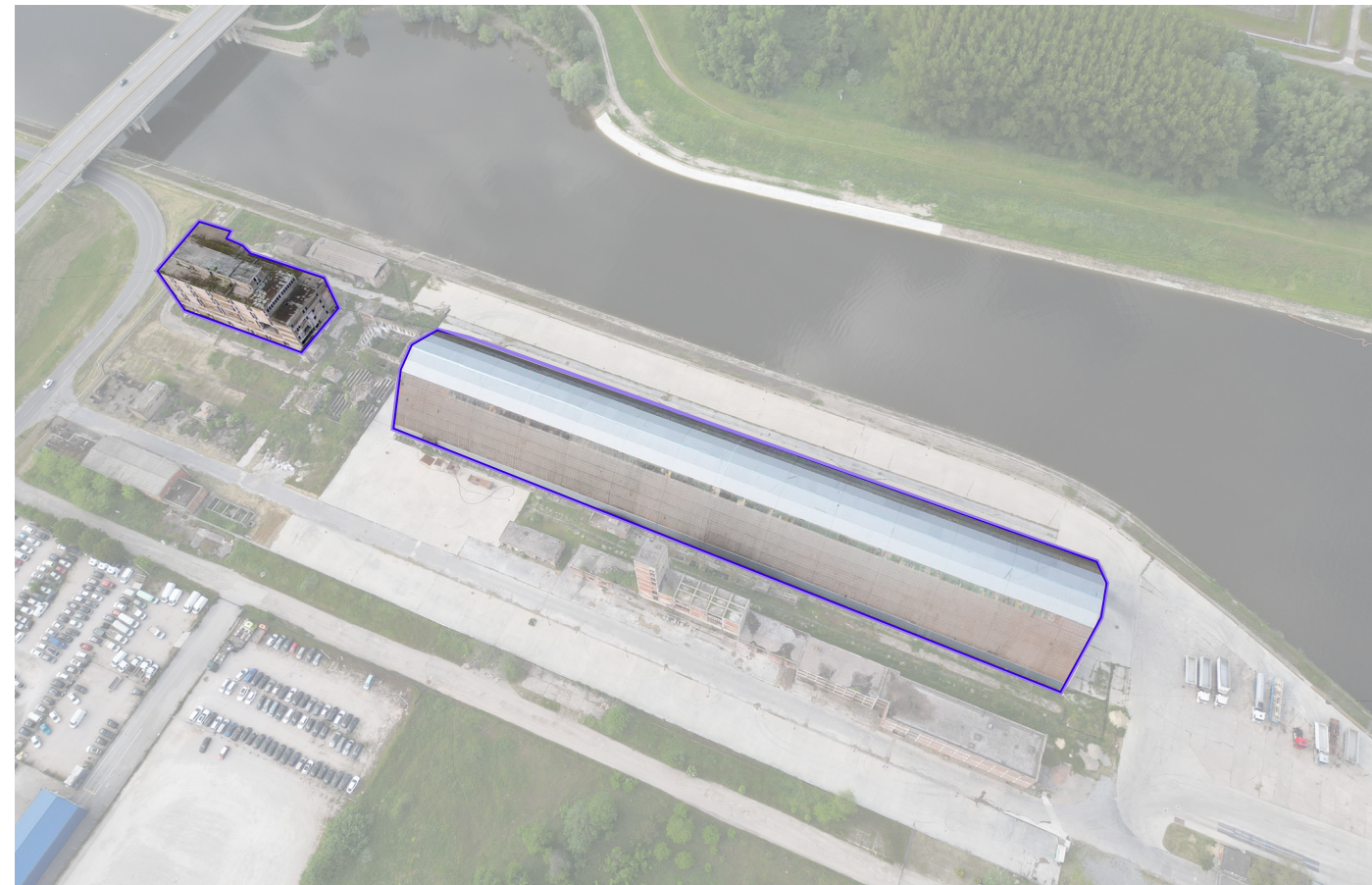
06 Urban Design Strategy and Proposal
Urban Design Strategy_ GENERAL IDEA AND DEALING WITH TRANSFORMATION OF THE ENTIRE FRINGE

TREATMENT OF THE EXISTING BUILT ENVIRONMENT

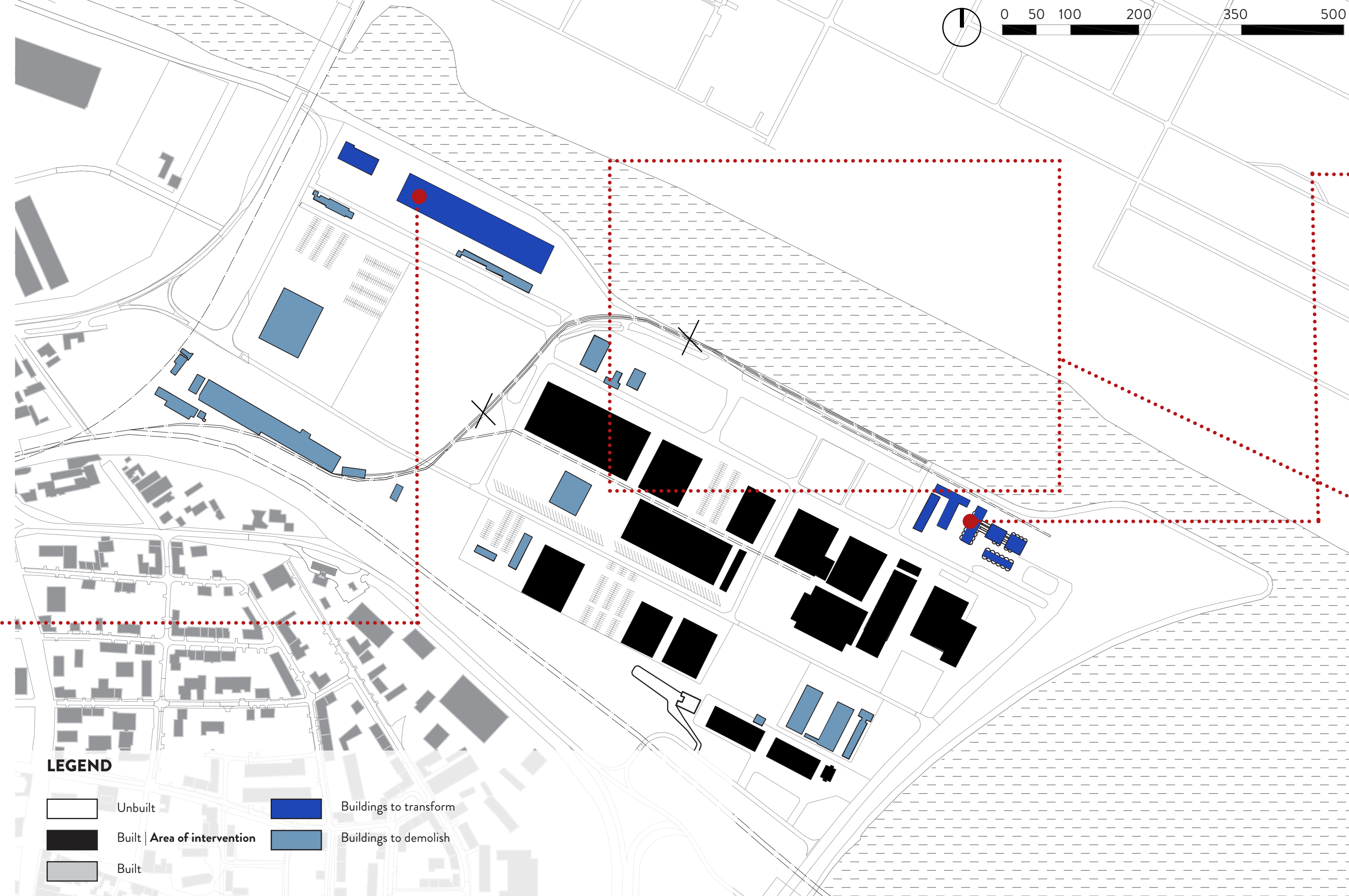
Transforming marked buildings is vital in preserving the identity of this industrial zone. Owners of buildings designated for preservation should give them special attention and regard them as integral components of the area. Removing buildings aims to reorganize

and improve land use for industrial and commercial purposes. The remaining factories and facilities are used for light industrial purposes and can be integrated with the zone's new urban language.

Agrohem, abandoned factory
 To be transformed



06 Urban Design Strategy and Proposal
Urban Design Strategy_ buildings



Port silos , 30 percent in use
 To be transformed

Import-export zone, in order to increase the capacity, transfer to the other bank of the Danube Tis Danube Canal
 To be transformed



06 Urban Design Strategy and Proposal
Urban Design Strategy_ GENERAL IDEA AND DEALING WITH TRANSFORMATION OF THE ENTIRE FRINGE

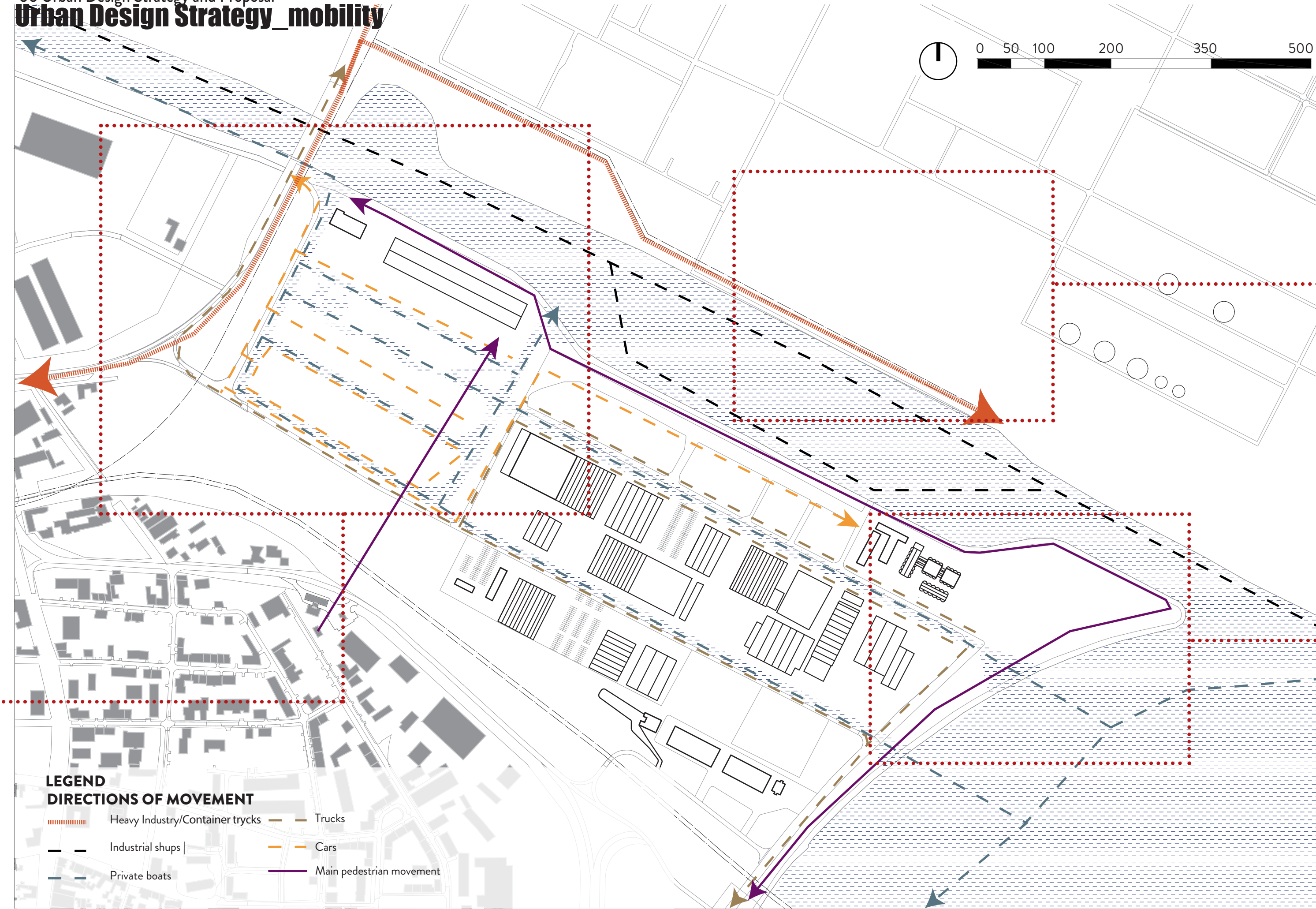
PROPOSAL OF NEW MOBILITY SYSTEM

The elaborate movement network aims to increase the area's connection with the city. Throughout history, the Danube has played an essential role in the lives of the inhabitants of Novi Sad. Introducing the canal system would give residents of Novi Sad another area to get close to and enjoy the water. This gesture would also increase the price of land, which would affect the further development of other industrial zones.

By organizing the traffic movement, the functioning of the remaining factories is improved.



06 Urban Design Strategy and Proposal
Urban Design Strategy_ mobility



Expansion of shipyard capacity to the area of the closed refinery

Implementation of waterways for private boats



06 Urban Design Strategy and Proposal

Heavy industry | Port of Novi Sad

Port needs to alter its layout. Additionally, due to the planned capacity expansion, suggest expanding the port to the opposite shore. Negotiate with the owner regarding the introduction and organization of business spaces and commercial content.

Light industry

Given its characteristic of being owned by different owners, with a part belonging to the port, it is suggested that the port in this area organize the administrative section. For the other owners, it is recommended to reorganize the storage spaces and free up space for new small business owners.

Light industry mix commercial

In this zone, industries dominate with manufacturing and selling products. It is suggested that they open up for the establishment of exhibition and selling rooms alongside the production areas. Reorganizing and responsibly utilizing land should create space for new businesses and investments.

Light industry mix corporate

This location is ideal for establishing a corporate zone because there is an abandoned building on the site, and adjacent to it is the company Typhoon HILL, specializing in software production and development. Business spaces for the IT industry, along with research centers and development facilities, should take precedence to give this area a new identity as a business IT zone.



It is necessary to provide new terminals for container ships and increase warehouse capacities according to new standards.

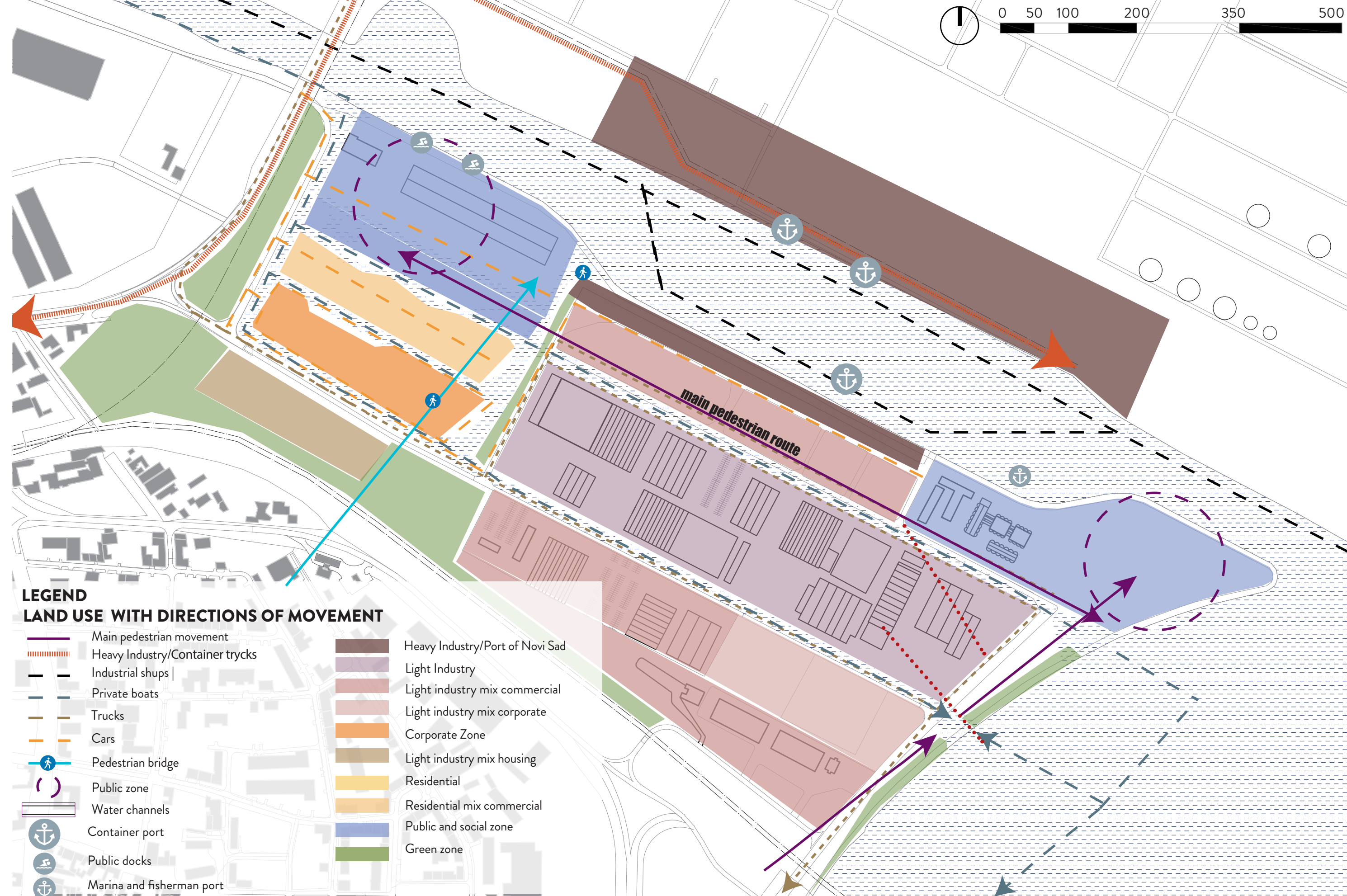


The introduction of water into this zone also necessitates the formation of a public port.



The idea of introducing and bringing people closer to the water should be supported by creating sunbathing docks accompanied by sports activities in the repurposed agrochemical warehouse, turning it into a sports center.

Urban Design Strategy_land use



Light industry mix housing

On this plot, there is a factory for shoe and kitchen equipment production. Consequently, in collaboration with owners involved in industries with low noise levels, residential spaces can be integrated. Since there is currently no form of social housing in Novi Sad, this should be considered as a space for it. The proximity to the railway can be mitigated

Residential Corporate zone

As the land is owned by the state, it can be maneuvered most easily and quickly here. The location is favorable due to its easy access to the main road and railway. Therefore, this space should be utilized for organizing a corporate zone along with modern residential housing.

Residential mix commercial

Novi Sad has been facing a housing production crisis and population influx for years, so it is essential for investors to see this zone as a potential for development. Introducing canals and enabling boat access to the area brings about a new form of modern living that should become exemplary.

Green zone Public and social zone

The outer belt along the water is reserved for public areas that are intended to become new landmarks of this area. It is recommended to introduce public facilities such as sports and cultural amenities. Supporting the introduction of greenery is also necessary to form a belt around the area and enhance the quality of stay.

Conclusion

In conclusion, the analysis of the prevailing 10-year urban plans for Novi Sad and Rijeka underscores their inadequacies in effectively addressing industrial fringes and integrating them seamlessly into the broader urban framework. The transitional economies of both cities encounter substantial challenges, particularly in dealing with neglected, centrally located industrial sites, necessitating intervention primarily from significant foreign capital investors. The imperative for Strategic Urban Planning emerges as a crucial factor for the advancement and sustainable development of these cities. Furthermore, a pressing need exists for the cultivation of productive city principles, essential for the successful reintegration of technology-based industries into the neglected urban cores while concurrently relocating major industrial activities from suburban

areas. Notably, both cities maintain a profound connection to their port traditions, further emphasizing the need for thoughtful urban planning strategies that consider and respect these historical ties.

The accomplishment of the outlined objectives is evident in the exemplary interventions within the selected areas. This involves the preservation and thoughtful consideration of the port in both urban layouts. One of the primary challenges encountered during the urban planning process was the significant disparity in ownership scales, spanning from national to local levels, as well as between small and large private ownership entities. The proposed urban policy seeks to address this challenge by fostering collaboration among stakeholders and facilitating the fragmentation of land to revitalize

the industrial fringes. **An important lesson learned from this experience is the necessity of conducting thorough assessments of the demand for various land uses prior to implementation, thereby encouraging meaningful collaboration among developers, stakeholders, and local communities to ensure the success of mixed-use development initiatives.**

The repeated significance of this case study extends beyond the specific cities of Novi Sad and Rijeka. Instead, it holds relevance for mid-sized urban environments within transitional European economies, offering valuable insights into the complexities and challenges faced by such cities in the contemporary urban landscape. As these cities undergo transformative phases, understanding and implementing effective urban planning

strategies become paramount for their sustainable growth.

Moving forward, recommendations for further research can be made to explore specific mechanisms for cultivating productive cities in urban contexts characterized by transitional economies. Additionally, a more detailed examination of community engagement strategies, the role of local governance in implementing proposed changes, and the impact of such interventions on the socio-economic fabric of the communities involved could provide valuable perspectives for policymakers, urban planners, and researchers alike.

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