



DOI: 10.21005/pif.2022.50.C-02

DEVELOPMENT OF TRANSPORT AND PASSENGER TERMINAL IN DNIPO: HISTORY, PRACTICE, PROSPECTS

UTWORZENIE TERMINALU TRANSPORTOWO-PASAŻERSKIEGO W MIEŚCIE DNIPO: HISTORIA, PRAKTYKA, PERSPEKTYWY

Iryna O. Merylova

PhD, Associate professor, arch.

Author's Orcid number: 0000-0003-2019-0780,

Scopus Author ID: 57211436194, Web of Science Researcher ID: Y-92-63-2019

Oleksandr A. Rechyts

Senior lecturer, arch.

Author's Orcid number: 0000-0003-3105-7942

Prydniprov's'ka State Academy of Civil Engineering and Architecture (PSACEA), Dnipro, Ukraine
State Higher Education Establishment
Department of Architectural and Urban Planning

ABSTRACT

The article discusses the history of the transport and industrial zone development, which was formed around the central railway station of the city of Dnipro. This area is significant because it has a direct connection with the city center. Changes in the industrial structure of the country and the city, global challenges and modern trends contribute to the transformation of these territories into the center of business and social activity of the city, as well as the region.

Key words: urban space, post-industrial territories, redevelopment, recreation.

STRESZCZENIE

Artykuł dotyczy historii powstawania i rozwoju strefy transportowo-przemysłowej, utworzonej wokół głównego dworca kolejowego miasta Dnipro i bezpośrednio przylegającej do centralnej dzielnicy miasta. Zmiany w strukturze przemysłowej kraju i miasta, globalne wyzwania oraz współczesne trendy sprzyjają transformacji tych terenów, w centrum aktywności biznesowej i społecznej zarówno miasta, jak i regionu.

Słowa kluczowe: przestrzenie miejskie, tereny postindustrialne, refunkcjonalizacja, rekreacja.

1. INTRODUCTION

The improvement of the economic and political situation in Ukraine in the second half of the 2000s and the steady growth of the economy addressed the problem of modernizing transport infrastructure, specifically railways, railway station and station complexes.

One more stimulating factor was the European Football Championship in 2012. For this event, the first new high-speed trains appeared in the country, connecting the capital of Ukraine with the largest cities of the country. It was followed by the reconstruction of the station complexes in cities of Lviv, Dnipro, Kharkiv, Donetsk. The extent of stations modernization depended on the involvement of the cities in the Championship. As a result, a new Kyiv-Pivdennyi railway station was built in the capital and a concourse was built in Donetsk, in other cities a reconstruction of stations without significant changes in functionality was performed. At the same time, the city of Dnipro was excluded from the list of participants in the football championship, which became an obstacle to the implementation of ambitious plans for the reconstruction of the station and the surrounding area. Buildings, structures and passenger platforms were redecorated and modernized.

Considering the current situation in Dnipro, it should be noted that the existing urban transport system is not able to cope with the intensification of transport and passenger traffic. In this case, it is necessary to create a multifunctional transport and passenger terminal that combines auto, rail and river terminals, aimed at ensuring free movement of people in different directions and a comfortable transfer to urban public transport.

This article presents the design experience of creating passenger terminals in Dnipro and proposes an urban development concept for the development of a transport and passenger terminal in the context of renovation of the industrial hub "Fabrychnyi".

2. MATERIALS AND METHODS

This study is based on scholarly works in the field of history of architecture and urban planning of the city of Dnipro, as well as in the field of renovation and gentrification of industrial areas (Andrushchenko N. P., Kavun M. E., Lopatyuk N. A. 2006, pp. 60-61; Shvidkovsky O. 1960. P. 68).

The basis for the study was the numerous design works carried out on the territory under consideration by the architects Pidorvan I., Shkovyra A., Terentiev V., Postrigan V. The materials of the Master Plan of Dnipro, Historical and Architectural Reference Plan (project), the zoning plan of the territory (project), the project for amending the general plan (*Historical and Architectural Reference Plan*. 2019. pp. 35-64, 117-130, 238-240; *Master Plan of the Place Dnipro*. 2019. pp. 134-136, Additions 206-217) were used in the study.

The study is based on the integrated approach to solving complex architectural and urban planning problems and the following research methods: theoretical, empirical and special methods of scientific knowledge.

Theoretical methods of historical, literary, cartographic analysis made possible to examine the photographic fixation of the area under investigation over a period of 1886-2021, the development history of the industrial hub "Fabrychnyi", maps of the area and general plans of the city of Dnipro (1776-1926 - Katerynoslav, 1926-2016 - Dnipropetrovsk) (Merylova I. O., Rechyts O. A. 2021, pp. 170-181). The information obtained made it possible to reproduce the stages of establishment, the extent of implementation and development paths of the considered industrial unit in the structure of the master plan: from the inception of an idea to its current state.

Empirical methods of comparative analysis were used when considering foreign practice in the renovation of industrial areas and the design of transport infrastructure facilities (Merylova I. O., Sokolova K. V. 2020, pp. 113-120).

A number of special methods (modeling and experimental design) allowed developing an urban planning concept for the renovation of the area under investigation, as well as suggest our own

view on the organization of the central avenue of the city (Merylova I. O., Rechyts O. A. 2021, pp. 183-192).

3.1. Analysis of transport hub development in Dnipro

The implementation of the Katerynoslav railway project began in the 1880s. The grand opening of the railway and the bridge across the river took place on May 18, 1884. This was the starting point for the development of Dnipro, located halfway between ore basin in Kryvyi Rih and coal basin in Donetsk. Such a favorable geographical position of the city served to develop the industry of both the city and the region as a whole.

The construction of the Alexander South-Russian Plant of the Bryansk Society began in 1885, the first metallurgical plant "specially designed for the smelting of Kryvyi Rih ores". Over the next eighty years, the railway and large-scale industry were the main forces that determined the pace, nature and direction of the development of Katerynoslav-Dnipropetrovsk (Yekaterinoslav railway. *Main Line Goryainovo-Yekaterinoslav*, 1903).

With the construction of the railway, the city entered a period of spontaneous development, during which there was an understanding of what was happening with the city and the principles for its further growth. During this period, the largest railway station in Ukraine was built in the city, erected in the neo-Russian style, dating back to the architecture of Russia in the 17th century. It was distinguished by splendor and a mass of decorative elements. Two massive towers punctuated the main façade. On the side facades there were characteristic porches in the style of the 17th century. (Fig. 1) (Kuzikova L., Antonov, S. 2009, pp. 10-11). Along with the station complex, locomotive repair and wagon workshops were built, the process of active construction work and development of an industrial zone, focused on railway transport, started (Andrushchenko N. P., Kavun M. E., Lopatyuk N. A. 2006, pp. 60-61).

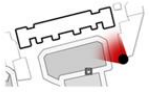
Since the second half of the 19th century, the city's population doubled every 10 years: 48,000 inhabitants in 1887 to 113,000 inhabitants in 1897. The growth rate of the city caused a significant traffic load on the station. As a result, in 1910, the railway was supposed to reconstruct and expand the station. It was not implemented (Andrushchenko N. P., Kavun M. E., Lopatyuk N. A. 2006, pp. 60-61).

In 1934, the Kharkov constructivist architect Lymar E. A., commissioned by the Stalinist Railway, completed the project of a new Dnipropetrovsk railway station and the reconstruction of Vokzalnaya Square, which was also not implemented (Fig. 1).

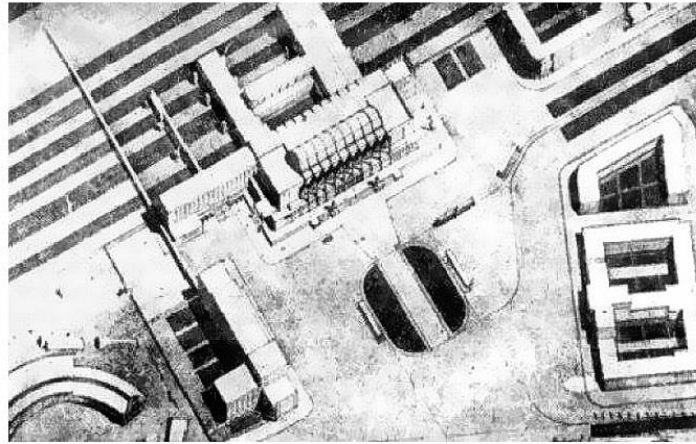
In 1941, as a result of a German bombardment, the station was destroyed. The base of the building, which was preserved until the end of the 1940s, made it possible to restore the building. However, the communist leaders decided to build a new building because the Neo-Russian style did not correspond to the ideological policy of the state, the building required functional changes and area expansion. The author of a new station project was the architect Dushkin A. N. Apart from the station in Dnipropetrovsk (1951) (Fig. 1), his projects include stations in Simferopol (1951) and Sochi (1952), high-rise building on the Red Gate square and Detsky Mir store in Moscow (Shrub K. Dniprovsky railway station and Amur bridge - 135 years old).

The newly-created station building soon became the center of the Vokzalnaya Square ensemble: two five-storey corner houses were built, one of which "flows" into Yavornitsky Avenue, was supposed to be decorated with a multi-storey completion with a tower, which was never built. (Fig. 2). In 1958, according to the project of the architect Zuev V. A., a seven-storey residential building was built opposite the station building, which "closed" the perimeter of the square and completed the creation of one of the most expressive ensembles of the city (Parkhomenko A. Dnipro panorama. History of Dnipro Station Square: unique facts).

1910



1934



1945, 1948



1951-nowadays



Fig. 1. Historical stages of the railway station building development in Dnipro. Source: Фотографии



Fig. 2. The current urban development situation regarding the main transport terminals of Dnipro. Source: Фотографии

In the 1970s a project of a railway post office was developed (architects Zuev A. V., Tovstik V. P.), which involved the unification of the spaces of Vokzalnaya and Staromostovaya squares into a single urban ensemble (Parkhomenko A. Dnipro panorama. History of Dnipro Station Square: unique facts).

In the 1970s and 1980s urban planners also proposed to create a single hub that can unite stations of various types of transport, concentrating them in one place: a railway station, a bus station and a river port (led by Vesnin V.) and Aeroflot agency near Vokzalnaya Square (Fig. 2) (Starostin V., 2018, pp. 253-258). This town-planning ensemble was implemented slowly and remained unfinished: the river port was built in the period 1986-1988, the bus station was completed in 1993, Vokzalnaya and Staromostovaya squares are still separated.

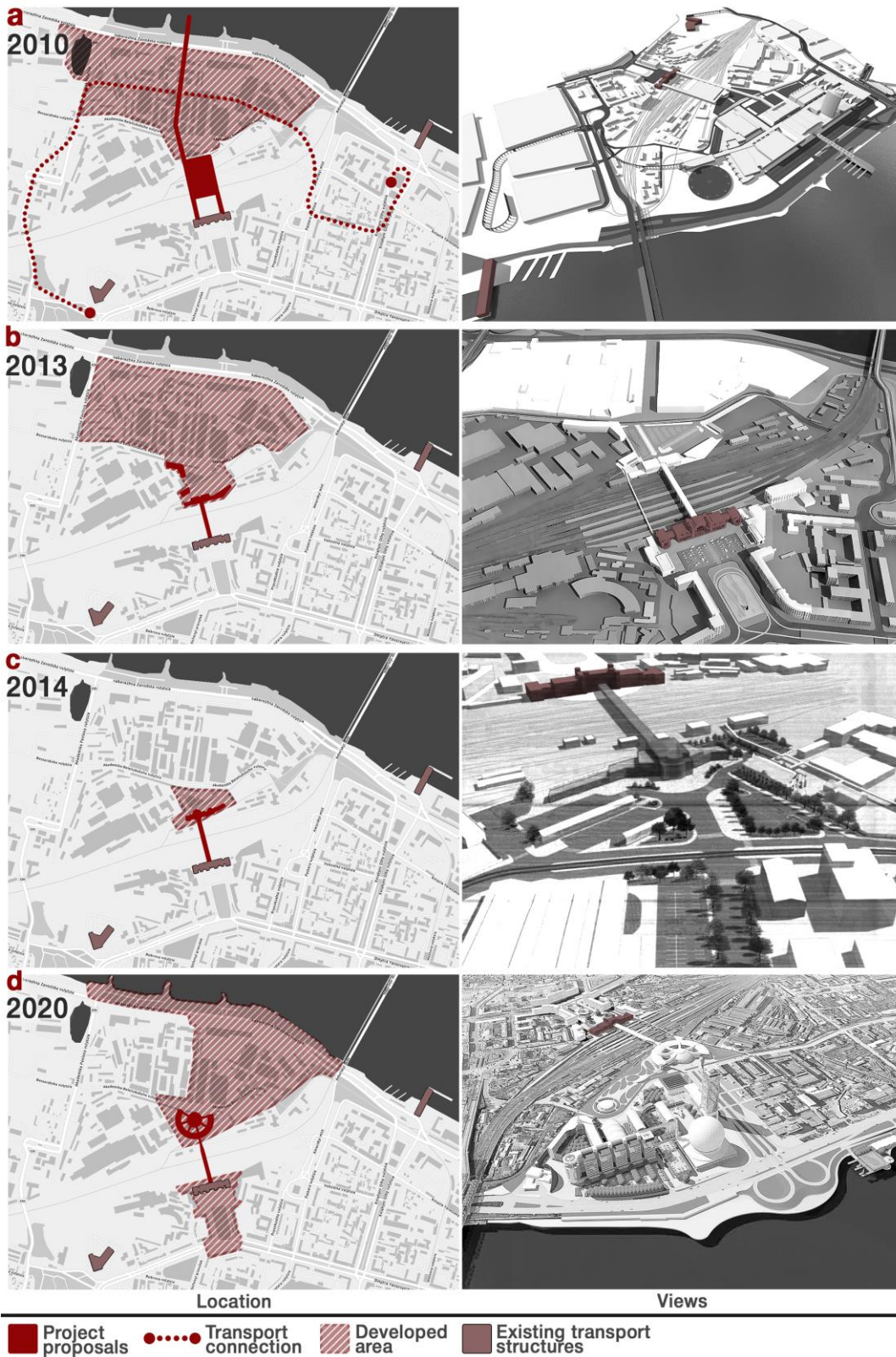


Fig 3. Analysis of project proposals for the reconstruction of the station complex and the adjacent territory: a) by Pidorvan I.; b) by Terentyev V.; c) by Postrigan V.; d) by Shkovyra A.

From 2010 to 2014 active pre-project surveys were carried out (the search for a concept for the reconstruction of the station complex and possible renovation of adjacent territory). In 2010, the town planning council considered the development concept for the railway station territories, presented by a team led by Pidorvan I. It was an attempt to comprehensively reconstruct the territory of the railway station, adjacent city blocks and part of the Fabrychnyi industrial hub, as a renovation area. The project included the construction of a concourse above the platforms and a new suburban station on the opposite side of the railway tracks, a new station square oriented towards the city embankment of the highway, a bus station and a river station in this complex. The territory of the industrial hub was supposed to be radically transformed with the placement of large public buildings (Fig. 3) (Pidorvan I., Shulyk E. 2010).

In the future, new attempts were made to develop projects for the reconstruction of the station complex by the staff of the design institute "Dnirogiprotrans" (Terentyev V. P. 2013) and a team of design institute "Gipromet" (Postrigan V. 2014). In these projects, purely local tasks for the possibility of building a passenger concourse and a suburban terminal pavilion were considered. These projects did not affect the adjacent territories and did not put forward conceptual urban planning ideas for the modernization of this fragment of the city (Fig. 3).

In 2020, a team led by Shkovyra A. Y. proposed a concept for developing the territory between the central railway station and the embankment of the river Dnipro (Fig. 3). The project proposal was aimed at the development of former industrial territories into a modern polyfunctional area. The concept developed the idea of creating a transport terminal on these territories (a new bus station, a river station). The design solution was not further developed (Shkovyra A. Y. 2020).

At present the program of President Zelensky V. - "Big Construction" is being implemented in the country, there is a massive reconstruction and construction of new infrastructure facilities. The Government of Ukraine has also adopted a program to renovate a number of station complexes. The station of Dnipro is one on the list in order to fine functional and planning solutions for the territory under consideration (Dnipro City Development Strategy "Dnipro Strategy 2030").

4. RESULTS

In addition to the above design solutions, professors and students of PCASEA are engaged in the search for a functional and planning composition of the transport hub in Dnipro as part of their graduation theses. The project presented in the article involves a rethinking of the territory of the industrial hub "Fabrychnyi". The concept set new compositional axes (directions) and dictates a new approach to the territory under consideration (Merylova I. O. 2019, pp. 384-392).

Historically, the railway gave rise to the rapid development of the industrial potential of the region and the city, and also formed significant industrial territories, which are currently in a state of stagnation and degradation. These territories are located in the floodplain and coastal part of the Dnipro valley, in close proximity to the central part of the city, are of high value. They are reserve territories for possible urban transformations related directly to the urban transport hub, as well as business and recreational activities, due to their location and the presence of objects of cultural and historical significance.

Modern processes, taking place in macroeconomics as well as in the economy of the country and a city in particular, require a rethinking of the attitude to the industry within the city and to the efficient and rational use of territories. In the modern world, in all spheres of public life, the intensification of technological processes is fully observed, achieved by improving both their technical component and their management processes. Under such conditions, it becomes necessary to create new "points of crystallization of the social function", which is an investment appeal. Such multifunctional units can become "innovative complexes", potentially emerging on the territory of the industrial district "Fabrychnyi". These complexes are considered in this concept as centers for business and social activity.



Fig. 4. The concept development of the industrial district "Fabrychnyi" and the territory of the transport and passenger terminal. Source: developed by authors.

The main factor for the creation of innovative complexes on the territory of the former industrial area under consideration is the creation of a powerful transport and passenger terminal, which involves the intensification of the transport function, improving the quality of the road infrastructure, as well as in the infrastructure of station buildings and complexes (Fig. 5).

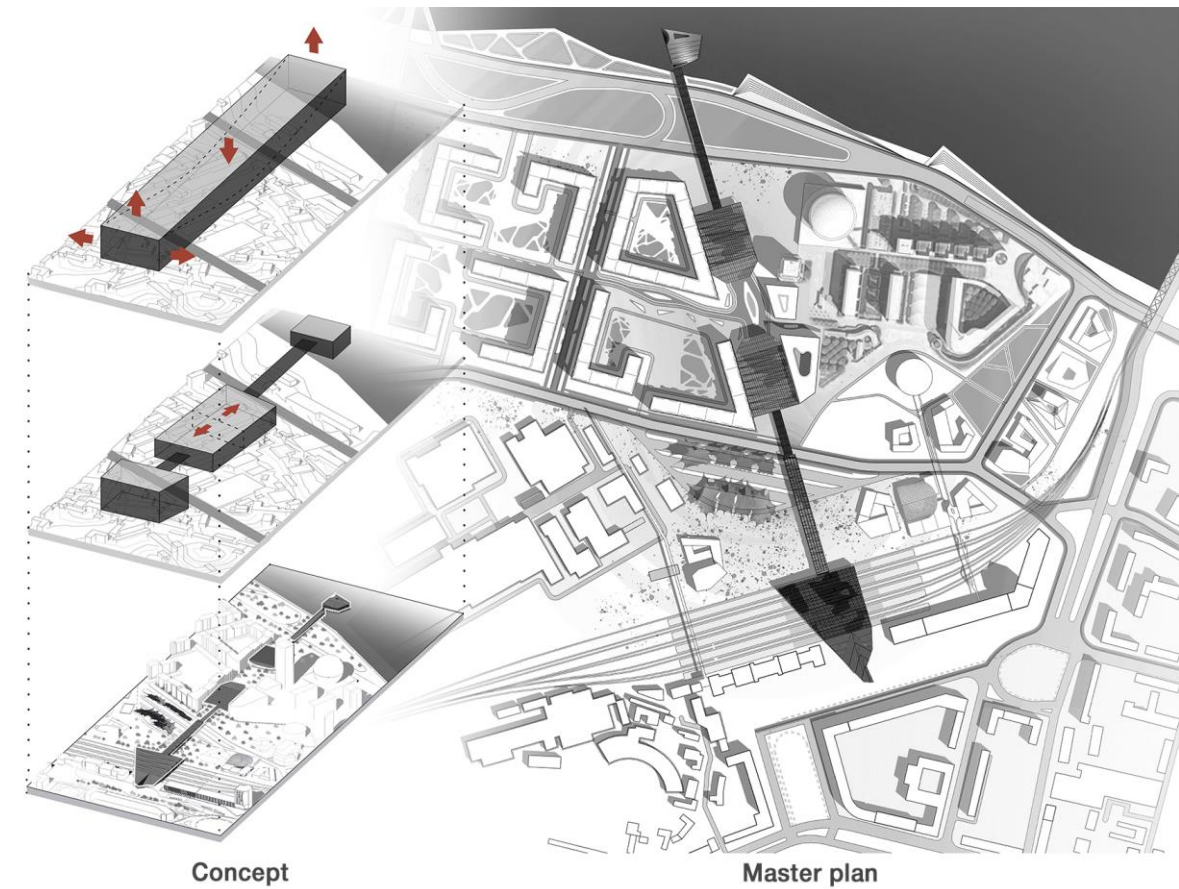


Fig. 5. Urban concept. Source: developed by authors.

The experience and practice of the developed countries suggests a probable scenario of the reorganization of industrial territories and reconstruction of the railway station. It could be achieved by transformation of the planning and spatial organization of the station square; expansion of the station complex through the construction of a concourse and partial functions transfer to the north side of the station complex; concentration of different modes of transport in a single transport terminal; removal of industrial enterprises from adjacent territories and placement of public and business facilities there.

The proposed transport and passenger terminal consists of three parts: the existing and prospective terminal of railway stations, a bus station and a river terminal (Fig. 5).

The concept is aimed at transforming a fragment of the urban planning structure, including industrial areas, railway infrastructure areas and a fragment of the central part of the city, and also involves the creation of a new innovative public space, with high capacity and a new quality of environment (Fig. 6).

The project proposes a new look at the creation of the station square, which is formed from two existing squares (Vokzalnaya and Staromostovaya) connected by a newly created overflowing space (Fig. 6). Different types of paving are used in order to divide transit routes into functional connections. Ever green plants, which do not lose their aesthetics all year round, are used for landscaping. All public spaces are filled with zones for waiting comfortably the departure.

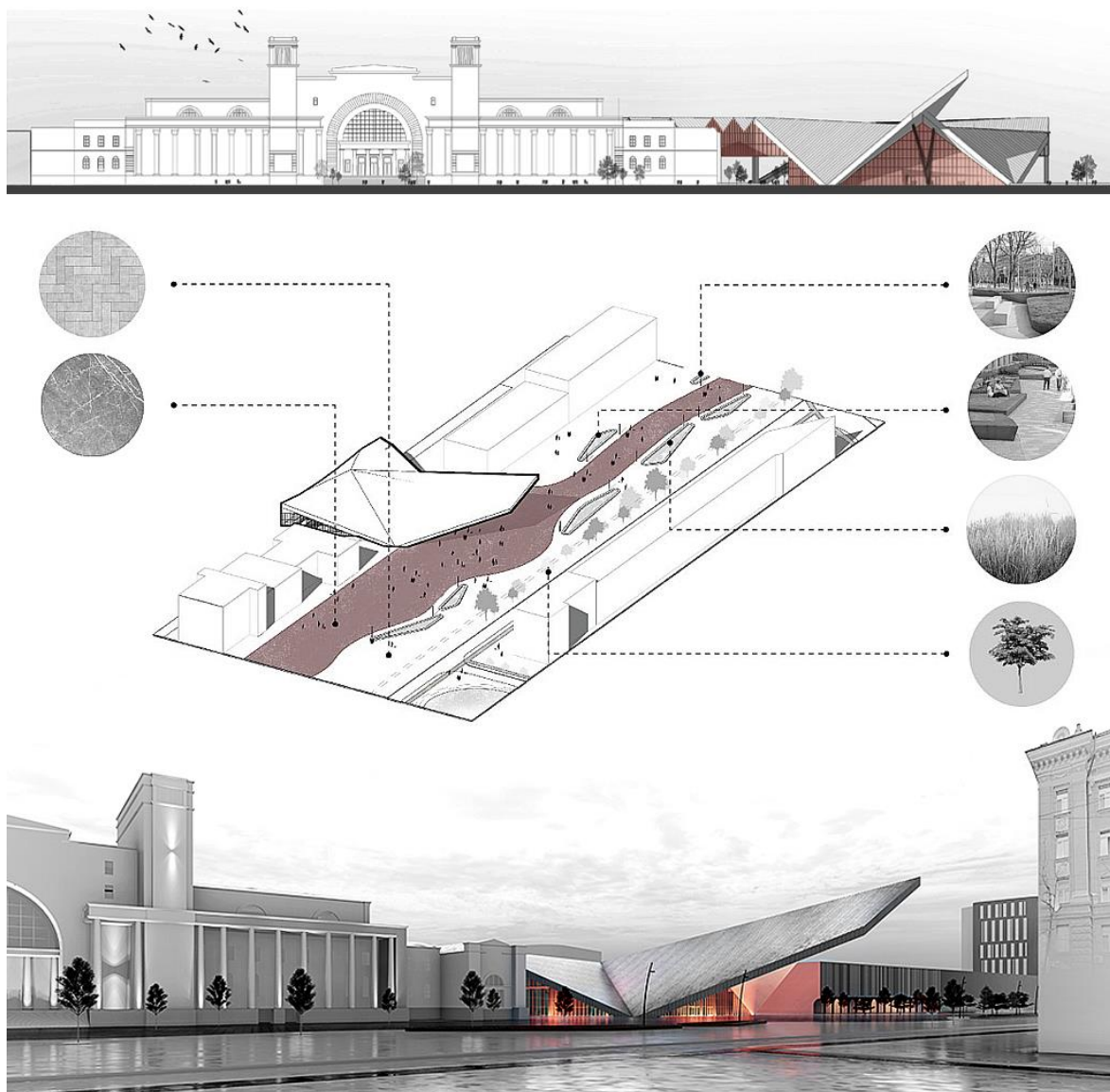


Fig. 6. Conceptual project for the creation of a new station space. Source: developed by authors.

5. CONCLUSIONS

In 2021 the city council of Dnipro approved the program "Dnipro Strategy 2030". The program sets goals for the development of the city in the near future, which involves an increase in the number of residents, the transformation of the urban environment and the strengthening of economic indicators, the development of the space and IT sectors, and what is especially important for this article, a large-scale modernization of transport infrastructure at the level of the city and region and its quality improvement.

The article presents an urban planning analysis of the existing transport hub of Dnipro: the history behind, current state and possible ways of development. The presented project proposal is intended to highlight and reveal the basic positive qualities of the area, as well as to resolve a number of urban planning conflicts, taking into account the most valuable conceptual developments of the architectural teams that investigate this territory.

The analysis of the urban environment showed that the existing urban transport system is not able to cope with the intensification of transport and passenger flows, which the city may encounter in the future. In this regard, it is necessary to create a multifunctional transport and passenger terminal that can provide necessary conditions without planning and spatial restrictions of the historical city. The complex transformation of the considered section of the urban fabric will create a necessary "growth point" for business and social activity, which can become an impetus for changes in both adjacent territories and the city as a whole.

BIBLIOGRAPHY

- Andrushchenko N. P., Kavun M. E., Lopatyuk N. A. *Dnipropetrovsk. Architects*. Ed. Kandel-Perminova N. N. Kyiv: A+C, 2006. pp. 60-61.
- Dnipro City Development Strategy "Dnipro Strategy 2030". Dnipro City Council. https://dda.dp.ua/wp-content/uploads/2021/12/rishenya-pro-zatverdzhennya-Strategiyi-ta-dokument-Strategiya-Dnipra-2030_83_12.pdf access 2021-12-08.
- International Center for Cultural Heritage and Property. *Historical and Architectural Reference Plan. Determination of Boundaries, Mode of Use, Modes of Regulation, Settings of Historical Areas of the City of Dnipro*. Vol. 1. Kyiv, 2019. pp. 35-64, 117-130, 238-240.
- Фотографии Днепра и области / zdjęcia Dniepru i regionu <https://gorod.dp.ua/photo/theme.php?id=82> access 2021-12-08.
- Kuzikova L., Antonov, S. *Yekaterinoslav-Dnepropetrovsk. Architecture and architects*. PRIVOZ PRINT, 2009. pp. 10-11.
- Merylova I. O. Comprehensive Assessment of the Urban Ecological State of the City of Dnipro. Problems and Solutions. *Urban Planning and Spatial Planning*. 2019. pp. 384-392.
- Merylova I. O., Rechyts O. A. Perspectives of the public space development in the historical part of Dnipro, Ukraine. *Przestrzeń i Forma*. 2021. pp. 183-192.
- Merylova I. O., Rechyts O. A. Stages of formation of industrial unit "Factory" in the city of Dnipro: history and prospects of further development. *Urban planning and territory*. 2021. №. 76. pp. 170-181.
- Merylova I. O., Sokolova K. V. A Human In The Urban Space Of The Globalized World. *Anthropological Measurements of Philosophical Research*. Vol.18. 2020. pp. 113-120.
- Parkhomenko A. Dnipro panorama. History of Dnipro Station Square: unique facts. <https://dnpr.com.ua/post/istorija-vokzalnoj-ploshhadi-dnepra-unikalnye-fakty-foto> access 2021-12-08
- Pidorvan I., Shulyk E. Architectural-planning and volumetric-spatial proposal for a stage-by-stage deep reconstruction of a part of the industrial area and the organization of a single passenger portal in the city of Dnipropetrovsk, consisting of a passenger railway terminal, a passenger bus terminal, a passenger river terminal, a passenger helicopter terminal on Naberezhnaya Zavodskaya in the city of Dnipropetrovsk. Dnipropetrovsk, 2010.
- Postrigan V. Construction of an engineering and transport infrastructure facility - the area of the suburban terminal st. Dnipropetrovsk in the city of Dnipropetrovsk. Pre-design work. Dnipropetrovsk: UKRGIPROMEZ, 2014. p. 29.
- Shkovyra A. Y. The concept of building the area between the central railway station of Dnipro and the embankment of Dnipro. 2020. p. 29.
- Shrub K. Dniprovsky railway station and Amur bridge - 135 years old. <https://gorod.dp.ua/news/160268> access 2021-12-08
- Shvidkovsky O. *Dnipropetrovsk*, Moscow: State publishing house of literature on construction, architecture, and building materials, 1960. p. 68.
- Starostin V. *Streets of Dnipro*. Kharkiv: Folio, 2018. p. 253-258.
- Terentyev V. P. Construction of a competition with a cash pavilion at Dnipropetrovsk Station. Pre-design studies. DNIPIROTRANS INSTITUTE. 2013.

Ukrainian State Research Institute of City Design "DIPROMISTO". Architectural and Planning Workshop №1. *Introduction of Changes to the Master Plan of the Place Dnipro. Explanatory Note*. By O. Malysheva, O. Golovan', and Yu Paleha. Kyiv: Dipromisto, 2019. pp. 134-136, Additions 206-217.

Yekaterinoslav railway. *Main Line Goryainovo-Yekaterinoslav*, Published by the Office of the Catherine Railway. Yekaterinoslav: Partnership "Printing by S. P. Yakovlev", 1903. Vol.1, p. 142.

AUTHOR'S NOTE

Iryna O. Merylova, PhD, Associate professor, architect and urbanist in Department of architectural and urban planning at State Higher Education Establishment Prydniprov's'ka State Academy of Civil Engineering and Architecture (PSACEA), 24-A, Chernishevsky str., Dnipro, Ukraine, 49600. The main area of research: urban planning, landscape design, create of ecological urban spaces.

Oleksandr A. Rechyts, architect, Senior lecturer in Department of architectural and urban planning at State Higher Education Establishment Prydniprov's'ka State Academy of Civil Engineering and Architecture (PSACEA), 24-A, Chernishevsky str., Dnipro, Ukraine, 49600. Member of the National Union of Architects of Ukraine (NSAU) and Architectural Chamber of Ukraine (ACU).

Contact | Kontakt: irina.merilova@gmail.com; alexr@i.ua